

Production

&

Revenue

Projection

MEMORANDUM

State of Alaska

TO: Senator Frank Ferguson
Co-chair, Joint Special Committee

DATE: September 10, 1986

FILE NO: 87-592

THROUGH: Gordon S. Harrison, Associate Director
Office of Management and Budget

TELEPHONE NO: 465-3568

FROM: Gregg Erickson, Senior Economist
Division of Strategic Planning
Office of Management and Budget

SUBJECT: The Jones Act and the
Price of Alaska Oil

Introduction

At the July 21 meeting of the Joint Special Committee on Tax Policy you requested that OMB provide you with background information and material regarding the Jones Act and the price of Alaska oil.

Background

Shipyard inefficiencies, lack of competition, and high labor costs, make American ships two to three times as expensive to build and operate as their foreign counterparts. Despite these higher costs, virtually all waterborne commerce between Alaska and the rest of the United States moves in U.S. rather than foreign ships. The reason is the Jones Act (Sec. 27 of the federal Merchant Marine Act of 1920), which requires that maritime trade between U.S. ports be carried in ships built in the U.S., documented under U.S. law, owned by U.S. citizens, and crewed by Americans.

Trade goods shipped between the Alaska and American ports must bear this burden, either as lower return to the seller or a higher price to the buyer. As a practical matter, Alaska usually bears the burden regardless of which way the commerce moves. In the case of Alaska crude oil, the burden is reflected in reduced wellhead values; over \$100 million per year may be lost to the State treasury due to lower severance taxes and royalties.

A related burden on the value of Alaska oil comes from the Export Administration Act of 1979 and other U.S. laws that prohibit the foreign export of Alaska oil. The prohibitions deny Alaska oil its most profitable markets in the Far East, and thus make the oil less valuable at the wellhead. A recent study by the federal Department of Commerce estimated the loss to the State treasury at \$333 million per year.

Some oil companies have opposed any relaxation of the export limitations, noting that much of their investment in U.S. flag tankers could be lost if exports were allowed. Oil companies'

September 10, 1986

production revenues would be enhanced if exports were allowed, however, and this would marginally encourage additional development of existing fields and further exploration.

Recent Studies

Several recent studies have addressed these issues. An annotated listing of those that appear most interesting in terms of the State revenue implications is attached. Copies of the studies themselves are attached with the original of this memorandum.

GKE/dmc

Attachments

cc: Committee Members

**Annotated Listing of Selected Studies
On The Jones Act, Oil Export Limitations,
and Alaska Oil Revenue**

U.S. Department of Commerce, *Report To Congress on Alaskan Oil*, June 1986. In 1985 Alaska made an unsuccessful effort in Congress to amend the Export Administration Act to allow some exports of Alaska oil. As a consolation prize for Alaska, Congress authorized and directed the administration to conduct the study that led to this Report. According to the study, the export limitations will cost Alaska \$1,330 million in the 1987-90 period (\$333 million per year), \$1,510 million in 1991-95, and \$1,116 million in 1996-2000. The study's findings generally support Alaska's position, though the authors make some factual errors and incorporate a number of unusual assumptions. For example, the federal study's "low" oil production scenario shows about twice as much annual production as the state's current "mean" production forecast.

Samuel A. Van Vactor and Arlon Tussing, "The Export of Alaska Crude Oil: Its Significance for Pacific Basin petroleum Trade," prepared for the International Association of Energy Economists annual meeting, June 1986. The authors believe that "[o]ver the coming year...the distortions and waste entailed by [the export limitations] will become more apparent, and as they come to light, the policy is likely to change. Once the inhibition on exports of Alaska oil is removed, there will likely be a cascade of reactions that will substantially increase crude-oil and petroleum product trade throughout the Pacific Basin."

State of Alaska, *Report to the Legislature on Implementation of Initiative 83-02*, January 1986. The initiative was adopted by the voters in 1982. It directs the governor to work for repeal of the Jones Act, and to annually report on those efforts. This was the first of these annual reports, and was largely prepared by John Katz and his staff in the governor's Washington, D.C. office. the report uses data from the Alaska Statehood Commission studies (cited below) to estimate that the Jones Act costs Alaska consumers \$40 million per year, and the state treasury \$225 million. The report is not optimistic about the prospects for near-term fundamental change in the trade restrictions.

National Advisory Committee on Oceans and Atmosphere, *Shipping, Shipyards and Sealift*, July 1985. The report focus on the national security implications of the Jones Act. It concludes that the nation's defense capabilities would be improved if foreign built ships were allowed to be used in the domestic maritime trade. The authors say they had access to "secret" and "official use only" Department of Defense materials on sealift capacity, etc.

Alaska Department of Revenue, "The Export of Oil to Japan - State Revenue Impacts," by Dr. Charles Logsdon in *Petroleum Production Revenue Forecast Quarterly Report, March 1983*. "Under a wide range of assumptions the State of Alaska would enjoy revenue increases should the current ban on exports [of Alaska North Slope crude oil] be removed. Though the impact illustrated ranges between \$10 and \$500 million per year..., the best guess revenue impact would probably be about \$50-\$100 million per year."

Simat, Hellieson, & Eichner, Inc., for The Alaska Statehood Commission, *The Jones Act and Its Impact on the State of Alaska*, July 1982; and Arlon R. Tussing and Associates, Inc., for The Alaska Statehood Commission, *Alaska's Economy and the Merchant Marine Act of 1920 (the Jones Act)*, September 1982. Though now somewhat out of date, these two studies still remain the best starting point for anyone wishing a good understanding of the effects of the Jones Act (and the export limitations) on Alaska.

12/10/84

DRAFT

REVENUE OPTIONS
(in millions \$)

	<u>FY87</u>	<u>FY88</u>	<u>FY89 & Beyond</u>
G.F. Revenues-unrestricted	\$1,399.2	\$1,325.0	\$1,373.9 (FY89)
Adjustments to G.F.	<u>7.4</u>	<u>0</u>	<u>0</u>
Current Unrestricted G.F	<u>1,411.6</u> =====	<u>1,325.0</u> =====	<u>1,373.9</u> =====
ONE-TIME REVENUE MEASURES:			
Budget Reserve Fund*	428.5		
Railbelt Energy Fund*	281.0		
AHFC Purchase of HAD Loans	100.0		
Bradley Lake (Change of funding source)	95.0		
Cash-out Loan Fund Balances*	37.3		
FY87 Restriction (10%) School Debt.	13.9		
Sale of Student loan Portfolio	136.0		
Sale of Other Loan Portfolios	122.9		
Dinkum Sands			238.0 (FY89)
Amerada HESS			? (FY90)
Disputed Taxes	?	?	? (\$1,495.0 owed in disputed taxes)
Repeal of Prior Year Cap. Approp.		? (up to \$1,100.0)	
Uncumbered AIDA Assets	162.0		?
Sale of AHFC - Privatization			?
Sale of AK Railroad			?
Sale of AK Railroad lands			?
Sale of 4 Dam Pool			?
RECURRING REVENUE MEASURES:			
Lottery*		11.8	11.8
Gov't. Loans & Debt:			
Debt Restructuring	50.0	45.0	35.0
AIDA Income Return to G.F.	41.8	41.8	41.8
AHFC Income Return to G.F.	28.9	28.9	28.9
AHFC Phase-out	?	?	?
Permanent Fund:			
Earnings Reserve*	281.0	18.0	0
Inflation Proofing*	138.0	357.0	484.0
Dividends*	362.0	393.0	423.0
Oil Taxes:			
ELF*	31.5	123.4	151.8
Severance Tax*		?	?
Petroleum Corporate Income Tax* (See Corporate Income Tax)		?	?
Separate Accounting		?	?
Reserves Tax*		280.0	280.0
Oil			
Gas			
Property Tax (per 1 mill)*		16.0	16.0

	<u>FY87</u>	<u>FY88</u>	<u>FY89 & Beyond</u>
Other Business Taxes & Licenses:			
Motor Fuel Tax Increase (\$.08/gal inc.)*		20.0	20.0
Aviation Fuel Tax Increase*		7.7	7.7
Waterfuel Tax Increase*		4.1	4.1
Misc. Fees Increase* 12.1		35.8	35.8
Licenses & Permits	5.4		
Corp.			
Occ. Lic.			
Motor Vehicles			
Bev. Lic.			
Amuse.			
Fishing & Hunting			
Vehicle License			
(1% of value)	13.4		
APUC	4.0		
Oil & Gas Cons.	2.5		
Bus. Lic. Fees	9.5		
Misc.	1.0		
Tobacco Tax*		1.5	1.5
Alcohol Tax*		4.8	4.8
Business Gross Receipts*			
Regressive		31.7	38.4
or		or	or
Flat		53.9	62.3
Corporate Income Tax *		93.0	93.0
Household and Individual:			
Income Tax*		125.0	250.0
Sales Tax @ 1% *			
with food		55.4	55.4
or		or	or
excluding food		33.0	33.0
School Head Tax (@ \$25 per person)*		5.0	5.0
Real Property Tax*		?	?
Personal Property Tax*		?	?
Land Speculation Tax*		?	?

* Legislation Required

BILL SHEFFIELD
GOVERNOR



STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

SEP 05 1986

STATE OF ALASKA

January 13, 1986

File Jones Act

The Honorable Ben Grussendorf
Speaker of the House
Alaska State Legislature
P.O. Box V
Juneau, AK 99811

Dear Representative Grussendorf:

At the General Election of November 6, 1984, the voters of Alaska adopted Initiative Number 83-02, "An Act terminating the Alaska Transportation Commission and repealing transportation laws administered by the commission; requiring persons who carry passengers or freight for hire to hold insurance or other security; and requiring the governor to lobby Congress for the repeal of the federal Jones Act."

The initiative provides in part: BE IT ENACTED BY THE PEOPLE OF THE STATE OF ALASKA:

Section 1: STATEMENT OF PURPOSE. The people of Alaska recognize that ... 5. a federal law, known as the Jones Act, requires that ships bound for Alaska from other American ports must be built and registered in the United States and staffed with American crews, thereby granting such ships an unfair monopoly and protecting them from free market competition, which costs Alaskan consumers millions of dollars each year; 6. the Jones Act should be repealed and the Governor should use all appropriate means to persuade Congress to do so. ... Section 4.AS 44.19 is amended by adding a new section to article I to read: Section 44.19.035 JONES ACT REPEAL. The governor shall use best efforts and all appropriate means to persuade the United States Congress to repeal 46 USC, sections 861, et seq., known as the Jones Act. Until that Act is repealed, the governor shall publish an annual report documenting the harmful effects of the Act on Alaska commerce, and progress made toward its repeal. The report shall be submitted to the legislature no later than its convening each year.

Two courses of action have been taken to comply with the initiative. The first was the direct effort by the Office of the Governor to lobby the Congress for repeal of the Jones Act and the preparation of the enclosed report on the repeal effort. The second was to prepare a report on the harmful impact of the Jones Act on Alaska commerce. Each of these items is developed more fully in the report which is enclosed with this transmittal.

In addition to the specific events related to Jones Act repeal, amendments, or waiver requests, we have also included in the report discussions of the various efforts directed toward improving the economic, legal, and political climate for the export of Alaska crude oil. International trade and the shipment of North Slope crude oil to Japan are economic goals shared by many Alaskans. Because Alaska's maximum potential for economic development, financial stability, and permanent job opportunities are linked to our status as a Pacific Rim international trading partner, we believe that advocacy efforts directed at developing trade should be included in the annual report. Accordingly, we have included those efforts in this report as they relate to Congressional consideration of the reauthorization of the Export Administration Act and the administrative decision to permit the export of Cook Inlet royalty oil.

The economic and political factors involved in the two issues of the Jones Act and international oil export are similar. They involve concerns about the energy independence of the United States, continued support of the domestic ship building industry, and the protection of merchant marine jobs. Even though we feel that the evolution of global trading and economics has changed many of the causal conditions that resulted in certain protectionist concepts and laws, these are nevertheless firmly held beliefs and will be difficult to overcome if we are to prevail in our goals. It is an educational challenge to provide information to our detractors in this effort and to demonstrate to them that the changes we are seeking are not detrimental to their own interests.

The first part of the accompanying report discusses many specific actions that my office and the Alaska delegation have initiated to seek relief from the Jones Act and to stimulate the export of Alaska oil. The negative impact of the Jones Act on Alaska commerce is the subject of the second part of the report. This section of the report is based on economic reports originally prepared in 1982 for the Alaska Statehood Commission. The briefing paper

prepared in August of 1985 shows that while there is an estimated cumulative cost to Alaskan consumers of approximately \$40 million annually due to Jones Act restrictions, the estimated reduction in wellhead value to Alaska because oil transport must be on Jones Act tankers is \$225 million.

These figures demonstrate the importance of the issue both to the State and to the federal government and also show the linkage between the Jones Act and the oil industry. Such points are discussed more fully in part two of the enclosed report.

I am pleased to submit this report as required by Initiative 83-02.

Sincerely,

Bill Sheffield
Governor

Enclosures

PART I

Efforts to seek repeal and modification of the Jones Act and other actions to promote Alaska international trade and shipping.

Following the adoption of the Initiative 83-02 on November 6, 1984, several actions have been taken by the Office of the Governor to seek repeal of the Jones Act by the United States Congress. Even before initiative 83-02 was adopted, however, Governor Sheffield had developed a State of Alaska position paper on the Jones Act. In a paper dated June 30, 1983, the thrust of the position was that:

(t)he State of Alaska favors an amendment to the Jones Act which would allow foreign-built ships into the U.S. coast cargo and passenger trade, provided that they meet American safety standards, and are U.S. owned, registered, manned and repaired. (See attachment 1.)

On July 6, 1983, this position paper on the Jones Act was distributed to the Chairmen and Ranking Minority Members of the House Committee on Merchant Marine and Fisheries, its Merchant Marine Subcommittee, and the Senate Committee on Commerce, Science and Transportation. (See attachment 2.)

3RD PROVISIO

Earlier, Governor Sheffield submitted testimony to Congressman Biaggi's Merchant Marine Subcommittee concerning a bill that would repeal a section of the Jones Act known as the 3rd proviso. (See attachment 3.) The 3rd proviso allows an exception to the Jones Act for merchandise that is transported between points within the continental United States over routes recognized by the Interstate Commerce Commission which include a Canadian rail connection. The exception was later extended to Alaska. In that testimony, the Governor stated:

Continued competition from 3rd proviso carriers is good for Alaska in that it maintains a greater diversity of cargo service and, perhaps, moderates the high cost of freight shipments to Alaska.

As a result, the State successfully opposed the passage of the bill to repeal the 3rd proviso exception.

HOVERCRAFT

Public Law 95-599 passed by the Congress as an amendment to the Surface Transportation Assistance Act of 1978 provided that foreign built hovercraft could be used for the

transportation of merchandise or passengers within the State of Alaska for a five-year period. That period would have expired in November, 1983. The specific hovercraft authorized for use were utilized in the oil industry. This Jones Act exemption was considered to be in the national interest due to concern about energy resource development.

H.R.1372 was introduced in February, 1983, for the purpose of authorizing the continued use of the hovercraft in Alaska. Foreign built hovercraft were permitted for an additional two-year period with a possible five-year extension, if the companies involved ordered an American built hovercraft before November, 1985.

Governor Sheffield submitted written testimony in support of H.R.1372 which was passed by the House on August 1, 1983. The Senate passed H.R.1372 on August 4, 1983, and the President approved the measure on August 26, 1983. The bill became Private Law 98-01 of the 98th Congress.

JETFOIL

In order to facilitate Southeast Alaska water transportation, the State arranged for a demonstration through the Boeing Company of a jetfoil to show that passenger and freight service was feasible using a high technology craft of this type. The Jones Act became a barrier to a longer term test of the concept after a successful summer demonstration, and a winter test showed the feasibility of regularly scheduled service in Southeast Alaska.

When it became known that the only vessel available for a longer term demonstration was not eligible to participate in the coastwise trade, the State of Alaska petitioned the U.S. Customs Service for a Jones Act waiver. (See Attachment 4.) While the vessel had been manufactured in the United States, it was sold to a foreign corporation and had been in service under a foreign registry. The Alaska Congressional delegation, other members of Congress, and representatives of private industry joined in requesting the waiver. In early November of 1983, the waiver was granted by the Department of the Treasury. (See Attachment 5.)

ALASKA ADVOCACY

These 1983 lobbying efforts by the Office of the Governor and the Alaska Congressional delegation made it clear that Alaska opposed the restrictive Jones Act provisions and favored an amendment that would remove the prohibition on using foreign-built ships in the coastwise trade. It was our judgment at that time that the prospects for Congressional repeal of the entire Jones Act were extremely unfavorable. If shipboard merchant marine jobs could be

protected, however, perhaps there would be some receptivity to lifting the ship construction restrictions to allow foreign built ships in the coastwise trade, as advocated in the Governor's July 6, 1983, letter.

Initiative 83-02, adopted in November, 1984, recognized as a matter of public policy the negative impact that the Jones Act had on Alaskan commerce.

On January 14, 1985, Governor Sheffield wrote to all Alaskan legislators in order to acquaint them with the legislative issues in the 99th Congress that the Alaska office in Washington, D.C. would be pursuing. (See attachment 6.) One enclosure to the Governor's January 14 letter was a memorandum from John W. Katz, Director of State/Federal Relations and Special Counsel to the Governor, identifying the priority issues of the legislative program. On page 6 of that memorandum, Jones Act Modifications are discussed. Specific reference is made to the passage of initiative 83-02 calling for the repeal of the Jones Act. Discussion of the Jones Act directive pointed out that:

(a)lthough we laid the basis for such activity in the past Congress, the chances for accomplishing anything in this area are not bright, as evidenced by the outcome of the proposal for a vastly more limited exemption for Alaska oil exports.

That memorandum was sent to the Alaska Congressional delegation, among others.

CUSTOMS SERVICE REGULATIONS

The Department of the Treasury Customs Service published a proposed rule on January 9, 1985, that modified regulations relating to the transportation of passengers by foreign vessels between ports or places in the U.S. either directly or by way of a foreign port.

Title 46 USC Section 289 provides that no foreign vessel shall transport passengers between ports or places in the U.S., either directly or by way of a foreign port, under a penalty of \$200 for each passenger so transported and landed.

Customs had previously adopted a 24-hour rule that coastwise laws were violated if a vessel remained in a coastwise port for more than 24 hours. The Customs Service had been advised that certain American ports, including those in Alaska, were placed in a disadvantaged position with respect to the tourist business.

The proposed regulations provided that the 24 hour limit be extended to permit foreign flag vessels from U.S. ports to land passengers at other U.S. ports for longer periods. It was generally believed that the proposed change would allow ports encompassed by the coastwise laws to compete favorably with nearby foreign ports for the ever-increasing revenues generated by the cruise ship industry.

The effect of the proposed ruling was to allow cruise ship operators to stop at a greater number of Alaskan ports for unlimited periods. Adoption of the proposal was a significant help to Alaskan tourism.

On February 20, 1985, the Governor wrote to William von Raab, Commissioner of the United States Customs Service. (See attachment 7.) In this letter, the Governor supported the change in regulations, pointing out the benefits to Alaska. The Governor's D.C. office also actively worked with the Congressional delegation and interested operators to secure the rules change. The ruling which was adopted made coastwise trade more competitive.

EXPORT OF ALASKA OIL

During the winter meeting of the National Governors' Association held in Washington, D.C., February 26-28, 1985, Governor Sheffield scheduled a series of meetings with various federal officials to discuss a variety of issues, including the Jones Act and international trade. (See attachment 8.) Individuals with whom the Governor met on the trip to Washington, D.C. included: Dr. Alton Keel, Associate Director, Office of Management and Budget for National Security and International Affairs; Allen Wallis, Undersecretary of State for Economic Affairs; John S. Herrington, Secretary, Department of Energy; and Malcom Baldrige, Secretary, Department of Commerce.

In addition, the Governor sent a letter to each member of the Alaska Congressional delegation. The February 21, 1985, letter drew their attention to Initiative 83-02 and sought their assistance for the repeal of the Jones Act. (See attachment 9.) Governor Sheffield held a meeting with the Alaska delegation on February 28 to discuss Alaskan issues. The Jones Act and its proposed repeal were on the agenda. The consensus at the meeting appeared to be that while repeal of the Jones Act was not a very likely action to expect from the Congress, we could still pursue individual relief and Alaska exemptions as opportunities arose. Continued opposition from several maritime interest groups can be expected, and they have the demonstrated ability to

mount an effective lobbying effort in the Congress. This opposition is a factor to be considered in our efforts to win repeal of the Jones Act.

In August of 1985, staff in the Office of the Governor prepared a briefing paper on the Jones Act for use in discussions by the Governor and members of the State administration. (See attachment 10.) The briefing paper succinctly presents many of the economic impacts of the Jones Act on various Alaska industries and on Alaska consumers. These cost impacts on Alaska commerce are more fully developed in Part II of this report. The briefing paper is presented here to demonstrate the continued concern by State officials over the Jones Act.

The most recent specific Jones Act activity resulted from an inquiry that Governor Sheffield made during the latter part of September, 1985. The Governor had been informed that operators of cruise ships might be experiencing some Jones Act problems that were interfering with operations in Alaska waters. Following conversations with representatives of the cruise ship operators, it was determined that the problems raised during these inquiries did not concern the Jones Act.

By the close of calendar year 1985, the State had developed a consistent record of Jones Act opposition that dated back to the early tenure of the Sheffield administration. In spite of successes in winning Jones Act exemptions for specific Alaskan situations, it is clear that the total repeal of the Act is unlikely in the near future. The Congress and certain Federal agencies have, however, demonstrated by granting limited exemptions, that there is sometimes a recognition of the special problems arising from Alaska's location as an off-shore state on the northern Pacific Rim.

Governor Sheffield has stated his economic goals many times; each time highlighting the need to create permanent, year-round private sector jobs, many of which are likely to be the product of natural resource development. This development must be accompanied by a corresponding growth of infrastructure within Alaska, and also a competitive transportation system to ship goods to commercial markets. The natural linkage between the barriers imposed by Jones Act restrictions on goods flowing to Alaska and the need to ease restrictions on the flow of goods leaving Alaska, involves not only the Jones Act but also other federal barriers. The Export Administration Act has presented a barrier to the sale of North Slope crude oil, our most significant natural resource from a revenue producing point of view. The prohibition on the export of North Slope crude oil has reduced State tax revenues and may be a factor in depressing oil exploration because of the transportation costs associated with Jones Act tankers. The global

structure of the crude oil market which indicates export of Alaska oil to nations on the Pacific Rim would be very cost effective, cannot be turned to our advantage until both of these legal restrictions are lifted.

Because free market competition and the stimulation of international trade seem to be a philosophical foundation of the current National Administration, Governor Sheffield has taken actions to seek the support of the Administration for our efforts to ease the trade restrictions that are most onerous -- specifically, the prohibition in the Export Administration Act against the export of North Slope crude oil. Governor Sheffield wrote to the President of the United States on December 26, 1984, to provide him with a status report on Alaskan-Japanese trade and to discuss specific actions that could be taken to promote such trade, particularly in natural resource products. This letter was written at a time when the President had a pending meeting with the Prime Minister of Japan, and the Governor wanted the President to be aware that increased commerce with Pacific Rim Nations is a major Alaskan international marketing goal that seems consistent with goals of the National Administration.

Governor Sheffield requested that the Administration help to ease restrictions on the export of Alaskan oil by supporting Alaskan efforts in the reauthorization of the Export Administration Act to remove the barrier to the export of North Slope crude. Active support from the Administration would assist in establishing a national policy of free market competition in the international trading arena and could prove instrumental in the eventual success of our efforts by creating support for similar arguments to be used in the Jones Act repeal effort. The industries and proposals discussed in that letter included oil, with emphasis on the possible sale of State royalty oil to Japan, natural gas, coal, fisheries, and timber exports. (See attachment 11.)

In a January 19 letter to the Director of the President's Office of Management and Budget, Governor Sheffield again sought the active support of the Administration to remove restrictions on the export of Alaska North Slope crude oil. (See attachment 12.) Because the views of the Administration would be considered by the Congress during reauthorization of the Export Administration Act, active support and advocacy by the Administration was critical to the State's position. In response to our efforts, the Administration continued to voice some support for our proposal, but would not become actively involved in Congressional lobbying on the issue.

The Export Administration Act Amendment of 1985 was signed into law on July 12, 1985, and became Public Law 99-64.

Section 126 requires an ALASKAN OIL STUDY to be accomplished within 9 months of enactment. The scope of the study is a:

(c)omprehensive review of the issues and related data concerning possible changes in the existing incentives to produce crude oil from the North Slope of Alaska (including changes in Federal and State taxation, pipeline tariffs and Federal leasing policies) ... as well as the appropriateness of continuing existing controls.

The report is due to the Congress on April 12, 1986, and provides a formal avenue for the full examination of the export of North Slope oil. The State has already provided information in connection with this study, and will continue these efforts as the Study progresses. (See attachment 13.)

Governor Sheffield, while in Washington, D.C. during early November, 1985, for another round of talks with key federal officials, again discussed the export of Alaska oil.

Throughout 1985, State officials had many contacts with various federal officials and members of Congress in relation to our goal of removing the barriers to the export of Alaska oil. We are not including a comprehensive catalog of those contacts in this report, only those that are most directly related to Jones Act issues. However, it is accurate to report that the export of Alaska oil has been and will continue to be a top priority as a matter of State policy, and in pursuing that policy goal, constant contacts are made with private sector, Congressional, and federal officials.

As a culmination of the 1985 efforts, most Alaskans were pleased when the Reagan Administration announced that Cook Inlet Oil exports would be permitted and that the necessary administrative and regulatory steps would be taken to make this possible. The State has already issued preliminary guidelines for the sale process, and a sale of royalty oil should occur before the end of the State's fiscal year. To assure this result, the State will oppose legislation which has been introduced in Congress to restrict the export of Cook Inlet oil.

From the perspective of 1986, as we look ahead to the export of Cook Inlet royalty oil, we can conclude that the strategy and efforts employed to date have produced favorable results. We are hopeful that continued efforts will also produce a favorable outcome in the export of North Slope oil and in the coastwise shipping trade, as well. The report required by the Export Administration Act, due in April, 1986, will hopefully provide a foundation for State efforts to seek beneficial modifications for the balance of the 99th Congress.

RECENTLY INTRODUCED JONES ACT LEGISLATION

During the closing days of the first session of the 99th Congress, three specific bills were introduced in the U.S. Senate that are indicators of the developing concern about the Jones Act and international trade issues. The content and nature of these bills is detailed below:

S.1935 was introduced by Senator Stevens on December 12. This is a bill to permit five foreign-built passenger ships to be documented under laws of the United States. There are certain restrictions in the bill, but its purpose is to promote the development of a domestic cruise ship industry and to allow these vessels to engage in the coastwise trade.

S.1929 was introduced on December 12 by Senator Mathias of Maryland. The Passenger Ship Authorization Act would also allow the documentation of partially foreign-built ships so that they would be allowed to participate in the coastwise trade. The legislation calls for the construction of the marine portions of new passenger ships in U.S. shipyards, while the "hotel" portions of the vessels could be built overseas. Under current law, such ships would not be permitted to trade between U.S. ports. In a statement accompanying the bill, Senator Mathias makes reference to the need to keep jobs in American shipyards and states that passage of the Passenger Ship Authorization Act would allow several hundred jobs to be created and help maintain our nation's shipbuilding capacity. In his view, the alternative is to lose all the jobs to foreign ship building. Since Senator Mathias represents a ship building industrial state, his actions may suggest a more favorable reception in the Congress to Jones Act modifications. This development may partly be the result of the international trade deficit and the balance-of-payments problem, but it may still help turn the Congress in a direction that is favorable to Alaskan goals.

S.1975 was introduced by Senator Goldwater on December 18. This bill provides a temporary eight-year exemption from the Jones Act for inflatable passenger boats or rafts. In his statement accompanying the bill, Senator Goldwater makes reference to the historical caution that the Congress exercises with regard to any proposed amendments to the Jones Act. However, he points out that businesses in the whitewater rafting industry have been told by the Customs Service that the use of foreign-built rafts between river ports is a violation of the Jones Act, and they must, therefore, stop using such rafts. Since the U.S. ship building industry is not able to meet this demand on short notice, Senator Goldwater believes the proposed exemption is warranted. The issue seems similar to the Alaskan hovercraft situation that was discussed earlier in this report.

It currently appears that the second session of the 99th Congress may actively consider legislation that bears directly on Jones Act issues. In conjunction with the Alaska Oil Study authorized by the Export Administration Act, many opportunities may arise for Alaska to actively advocate its position. It should be a significant benefit to express our interests through legislative vehicles introduced not only by our delegation, but also by other members of Congress who are not identified as having a special Alaska interest in the outcome.

PART II

Data presented in 1982 to the Alaska Statehood Commission estimated the impact of the Jones Act on Alaska commerce. Part II of this report excerpts from THE JONES ACT AND ITS IMPACT ON THE STATE OF ALASKA, Volume I: Executive Summary prepared for the Alaska Statehood Commission by Simat, Helliesen, and Eichner (SH&E), Inc. July, 1982. We believe the report presents an analysis of baseline data that continues to provide a valid assessment of the present impact of the Jones Act on Alaska commerce.

We have also included parts of the report prepared by Arlon R. Tussing and Associates, Inc. (ARTA), entitled ALASKA'S ECONOMY AND THE MERCHANT MARINE ACT OF 1920, (The Jones Act), A follow-up and Review of the Jones Act and its Impact on the State of Alaska, by Simat, Helliesen and Eichner, Inc., for the Alaska Statehood Commission, September 20, 1982.

The discussion by ARTA offers a critique of the earlier data and provides a balance to the discussion of the economic impact of the Jones Act on Alaska commerce. A summary of some of the significant changes and events that have taken place relative to the coastwise trade and the Jones Act is also included to indicate how these recent events affect Alaska commerce.

THE JONES ACT AND ITS IMPACT ON THE STATE OF ALASKA
Volume I: Executive Summary
Prepared for the
Alaska Statehood Commission
by
Simat, Helliesen & Eichner, Inc.
July 1982

MAJOR CONCLUSIONS

The Jones Act and Alaska's Liner Service

- o Commerce of the State of Alaska moving in liner services, mostly consumer goods and business supplies, is absorbing an aggregate annual cost of approximately \$41 million because of the restrictions imposed by the Merchant Marine Act of 1920.
- o Due to the inherent directional imbalance of Alaska cargoes, the incidence of higher costs and rates is having the greatest impact on northbound cargoes.
- o In the high-volume Anchorage-Pacific Northwest trade, the state may have a potential for reducing rates by stimulating backhaul cargoes. The extra cost of transportation for such cargoes would be low.
- o In modern containerized-type operations, the bulk of the costs are not flag related. Consequently, the scope for cost and rate reductions as a result of introduction of foreign-flag services is not as great proportionately as in other sectors of the merchant marine.

The Jones Act and Alaska's Crude Oil Transportation Service

- o Alaska's net return from its oil sales is being reduced due to the additional costs imposed by the Jones Act, which, based on current conditions, are approximately \$225 million per year.

Current Use of Exemptions from the Act

- o The State of Alaska has some relief available from the Merchant Marine Act of 1920. This relief is currently not being exploited. Non-use of this loophole does indicate that the cost savings ultimately available from use of foreign-flag vessels may not be as great as has sometimes been supposed.

Changes in U.S. Maritime Policy

- o In view of the Administration's apparent position to uphold the Jones Act, efforts to have it rescinded in toto will be difficult in the immediate future.
- o Given the recent lifting of prohibitions on overseas-built vessels for U.S. subsidized trades, the State of Alaska may wish to consider an effort to obtain a waiver of the requirement to use vessels built in the U.S. and place less emphasis on changing the remainder of the Jones Act.
- o The State of Alaska should develop a coordinated, thoroughly considered Jones Act strategy that seeks reasonable and politically attainable concessions in areas where the cost impacts are most meaningful. This approach has the potential for success, and can be instrumental in reducing the impact of the Jones Act on the State's economy.

The following material has been selected from the report prepared by SH&E and is intended to further explain the major issues of importance to Alaska and to amplify the major conclusions.

All of the material is intended to convey the original work and thoughts of SH&E although it has been selectively edited and arranged for the purpose of this report.

The Jones Act Fleet

The Jones Act fleet consists of those vessels eligible to engage in the coastwise trade. Generally, that includes any vessels built in the U.S. under U.S. ownership, registered under the laws of the U.S., and not restricted because of subsidy status. Vessels that have received Construction Differential Subsidy (CDS) or are receiving Operating Differential Subsidy (ODS) from the Maritime Administration cannot serve the cabotage or coastwise trade without special waivers.

Alaska trade fleet of six dry cargo freighters and 88 tankers constituted 28.9 percent of the Jones Act fleet and 16 percent of the active U.S.-flag privately owned fleet. Alaska trade freighters constitute only 8.6 percent of the total Jones Act eligible freighters. The containerships are smaller than those generally found in the Jones Act fleet and the Roll-on/Roll-off (Ro/Ro) ships are larger. Among tankers, the Alaska trade fleet is made up of 34.4 percent of the total Jones Act fleet, but has 54 percent of the

carrying capacity. This is because tankers in Alaska service are larger than the fleet average.

ALASKA WATERBORNE TRADE

Alaska's waterborne commerce is dominated by crude oil shipments from Valdez which accounted for 89.5 percent of Alaska's total port activity in 1979. When crude oil shipments are subtracted from the total, remaining waterborne commerce is 34.5 percent foreign imports and exports, 47.5 percent coastwise receipts and shipments, and 18 percent internal receipts and shipments. Excluding crude oil shipments, the activity of the top ten Alaska ports includes approximately 60 percent of the state's total waterborne commerce.

ALASKA SHIPPING COSTS

The Impact of Costs on Rates

The cost of shipping in the Alaska trade, and the cost premium caused by the Jones Act, were estimated by comparing the cost of present vessel services with the probable cost of those services were they operated with foreign-flag ships. Although it is true that the observed impact on customers is conveyed through shipping rates, not underlying shipping costs, and that competition and value of service, or "what the traffic will bear," establish freight rates for each commodity in the short run, costs set the limits for freight rates in the long term. In other words, although cost and rate may not be the same or even similar for any given commodity at any given time, in the long run (and/or over a mixture of commodities carried in the same service), rates are, in fact, cost determined. Hence, the cost-based method is a valid approach for determining the relative impact of differing governmental policies which affect the long term character of a shipping market.

IMPACT OF THE JONES ACT ON ALASKA COMMERCE

	U.S.-Flag		Foreign-Flag	
	Cost Per Voyage	Cost Per TEU*	Cost Per Voyage	Cost Per TEU
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS FOR CONTAINERSHIP OPERATIONS ANCHORAGE/SEATTLE				
Total	\$981,774.66	\$1,055.67	\$850,658.24	\$914.69
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS FOR RO/RO SHIP OPERATIONS ANCHORAGE/SEATTLE				
Total	\$1,024,030.32	\$922.55	\$889,373.98	\$801.24
	Cost Per Voyage	Cost Per TON	Cost Per Voyage	Cost Per TON
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS FOR VLCC OPERATIONS VALDEZ/LOS ANGELES				
Total	\$717,599.08	\$5.98	\$551,253.68	\$4.59
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS FOR PRODUCT TANKER OPERATIONS LOS ANGELES/ANCHORAGE				
Total	\$448,626.98	\$12.82	\$257,541.43	\$7.36

* TEU is "Twenty-foot Equivalent Unit," the standard measure of output in the container trades. In Alaska, most or all containers are 35' or 40' long, and based on total cubic volume are considered equivalent to two TEU's.

These summary runs indicate that the relative impact of the Jones Act on Alaskan commerce varies with specific circumstances. For example, in liner trades (represented by container and Ro/Ro vessels) a significant part of the total cost relates to containers, cargo handling, and other cargo-related functions. These are not affected by the Jones Act. Hence, the relative cost difference between U.S.- and foreign-flag vessel service is less than, say, the tanker trades, where Jones Act-affected cost categories make up a much larger share of the total cost.

The Impact of The Act on Liner Services

The total U.S.-flag premium cost for liner services in the Alaskan trade (i.e., services which transport package cargo such as consumer goods, automobiles, machinery, etc.) is about \$41 million per year, as follows:

	<u>Container</u>	<u>Ro/Ro</u>	<u>Tug Barges</u>
Cost per trip - U.S.-flag	\$981,774	\$1,024,030	\$195,217
Cost per trip - foreign-flag	<u>850,658</u>	<u>889,373</u>	<u>158,023</u>
Net	\$131,116	\$134,657	\$37,188
Voyages per year	X 155	X 100	X 200
	<u>\$20,322,980</u>	<u>\$13,465,700</u>	<u>\$7,437,600</u>
	<u>GRAND TOTAL</u>		<u>\$41,226,280</u>

The cost penalty applies to commodities as a group. How it may be distributed to any specific commodity or group of commodities is uncertain; if any one item is judged to pay less premium, then something else must automatically be said to pay more, and the net result to the people of Alaska is essentially the same.

With regard to the relative impact of the Act on inbound versus outbound commodities, the analysis indicates it is northbound liner commodities which are most likely absorbing the cost premium, meaning the direct (or initial) impact of the Jones Act is falling more heavily on Alaskan receivers and consumers rather than on Alaskan businesses shipping their products southbound.

The Impact of the Act on the Crude Oil Trades

With regard to crude oil, the Required Freight Rate (RFR) analyses indicated the differential between U.S.- and foreign-flag tanker operations in the Valdez to Los Angeles service is \$1.39 per long ton. For shipments from Valdez, transshipped at the Panama Canal and sent onward to the U.S. Gulf Coast, the differential would be \$5.67.

Assuming an average annual U.S.-flag shipment rate of 80 million tons per year, with two-thirds moving to California and one-third to the Gulf Coast via Panama, the annual cost penalty ultimately being borne by Alaska through the netback mechanism is \$225 million. Clearly, the Jones Act's major impact on Alaska is in the sphere of crude oil shipments.

ALASKA'S ECONOMY AND THE MERCHANT MARINE ACT OF 1920
(The Jones Act)

A Follow-Up and Review of
The Jones Act and its Impacts on the State of Alaska
By Simat, Helleisen & Eichner, Inc.
For the Alaska Statehood Commission
20 September, 1982
Arlon R. Tussing and Associates, Inc. (ARTA)
Juneau - Seattle - Anchorage

EXECUTIVE SUMMARY
(Principal Findings)

This paper was prepared by Arlon R. Tussing and Associates, Inc. (ARTA) for the Alaska Statehood Commission as a follow-up, review, and interpretation of the analysis and findings contained in The Jones Act and its Impact on the State of Alaska, by Simate, Helleisen & Eichner, Inc. (SH&E). The following are among the most important inferences that readers can draw from the SH&E study and from this review.

1. The "cabotage" laws of the United States, of which the Jones Act is the keystone, impose substantial costs on the U.S. economy, in the form of higher oceanborne freight charges, and the diversion of cargo to more expensive transportation modes.

These costs of the cabotage laws are imposed disproportionately on Alaska. The state's physical separation from the other states makes it depend disproportionately on ocean transport for its interstate commerce. In addition, Alaska's large size and primitive land-transportation network make it depend disproportionately on ocean transportation for its intrastate commerce.

2. Because Alaska's economy is small and distant from major markets, the Jones Act creates a DOUBLE cost penalty for Alaskans. The state is generally a price-taker for both its imports and its exports; thus, the Jones Act adds to the prices of Alaska's imports and subtracts from the prices of the state's exports.
3. The "Jones Act penalty" (the additional cost of using U.S.-built, U.S.-owned, U.S.-registered, and U.S.-manned vessels in place of the lowest-cost transportation) tends to be greatest for commodities having a low ratio of value to weight or to volume.

The cost of Alaska from the Jones Act penalty on the outbound shipment of crude oil probably overshadows all other costs of the Act. SH&E's analysis implies that

the law currently reduces the wellhead value of Alaska crude oil by about \$225 million per year. Consideration of the worldwide surplus of foreign-flag tankers raises this penalty to about \$310 million per year. Taking account of current trends in West Coast oil-price formation increases the potential penalty at the wellhead to \$630 million per year.

The state government's share of increased (or decreased) wellhead revenue is now about 28 percent. This approach yields a direct revenue cost of the Jones Act to Alaska's treasury in the range of \$63 to \$176 million per year.

4. The IMMEDIATE effect of removing either the Jones Act requirements or export restrictions on Alaska crude-oil shipments would probably be minor: The North Slope crude-oil producers have already invested in Jones Act tankers and have made throughput commitments to an oil pipeline across Panama. Also, the incentive of Alaska crude-oil producers to seek transportation-cost reductions is weak, because the combination of royalties and severance taxes, "windfall-profits tax", and federal and state income taxes leaves the producers less than 10 percent of any increase in wellhead prices stemming from lower ocean-transport costs.

Some latitude would remain for non-producers purchasing "in-kind" royalty oil from the state to use lower-cost shipping services.

5. The prohibition on exporting Alaska crude oil depresses its "netback" price (and thereby state oil revenues) more than does the Jones Act; repeal of the prohibition would make the Jones Act nearly moot with respect to crude-oil prices.

Alaska's Congressional delegation might therefore employ its political efforts most effectively in trying to block extension of the oil export prohibitions of the Export Administration Act (which expire in 1983), rather than in mounting new legislation to repeal some of the present Jones Act provisions.

6. The direct cost of the Jones Act to Alaska's PRESENT export industries other than petroleum is probably small. Some of these industries tend to be oriented to overseas markets where the Jones Act is irrelevant. Others can take advantage of low-cost Southbound "backhaul" rates unrelated to the nationality of the vessel.
7. The direct cost of the Jones Act on Alaska's general-merchandise imports is impossible to measure with

confidence, but it is probably minor. There is vigorous intermodal competition on routes between the Northwest and Alaska's "Railbelt" (which contains most of the state's population and economic activity).

Transportation costs to and between Alaska ports other than those serving the Rainbelt are mostly a function of the small scale and sporadic character of shipments, rather than the nationality of shipping or vessels. A number of methods by which shippers could circumvent Jones Act cost penalties are virtually unexploited; this situation supports the inference that these penalties are insignificant.

8. The largest adverse effects of the Jones Act for Alaska are likely to be IN THE FUTURE, as transportation costs for crude-oil and other minerals can be an important factor determining the economic feasibility of developing specific deposits. Transportation costs between Alaska and the Lower 48 that are higher than those between Alaska and foreign countries also strengthen the tendency of Alaska's resource-industry markets and sources of investment capital to be in the Far East rather than the Lower 48.
9. The most promising Alaska strategy to modify the Jones Act would aim at obtaining the support of U.S. maritime unions and shipping companies (or at least their neutrality) for allowing foreign-owned and foreign-built ships to operate in the "coastwise" trade, while retaining U.S. labor, safety, and environmental standards.

One basis for this strategy might be the thesis that allowing foreign-built ships in the coastwise trade would increase employment in the U.S. merchant marine. The Jones Act has probably contributed to the virtual disappearance of the U.S. coastwise shipping industry (except for shipments of petroleum by tanker, and service linking Alaska and Hawaii with the mainland). A first tactic in such a strategy would be for the state to commission a study of the effect of the U.S.-tanker requirement in the Jones Act on U.S. merchant-marine employment.

The SH&E report. The SH&E report is well written, comprehensive, and insightful, and contains little with which APTA have substantive disagreements. Its quantitative (dollar-denominated) findings about the economic effects of the Jones Act in Alaska suffer from the same disabilities that beset almost every "counterfactual" analysis -- every study that attempts to describe the world that would exist "if only" some circumstance or set of circumstances were different from present reality.

In any analysis of this sort, the investigators have almost infinite discretion in choosing assumptions about which factors to hold constant, and how far to trace the indirect effects of the assumed change. Thus, ARTA probably would have made different assumptions from those employed by SH&E, and emphasized different factors, but we do not thereby mean to fault the SH&E team for the assumptions and methodology they selected. Our object here has been to organize, integrate, and present essentially the same insights as the SH&E report in a way which, we hope, is more directly focused on Alaska's policy choices.

The following material has been selected from the report prepared by ARTA and is intended to further explain the major issues of importance to Alaska and to amplify the principal findings.

All of the material is intended to convey the original work and thoughts of ARTA, although it has been selectively edited and arranged for the purposes of this report.

THE IMPACT OF THE JONES ACT ON ALASKA

The Jones Act Cost Penalty. Whatever transportation-cost penalty the Jones Act carries is imposed disproportionately on the Alaska economy. In general, the relatively small size of Alaska's economy makes it a "price-taker" in national and international markets. Higher transport costs are thus added to the cost of Alaska's imports, and subtracted from the market prices of her exports.

Alaska's position as a price-taker means that its economy tends to suffer a double penalty from any adverse transport-cost differential. In general, the state's exports to lower-48 markets will have lower prices at their point of origin than would otherwise have been the case. The most obvious impact of this kind is on the state government's natural resource royalties and severance taxes, which are keyed to netback prices.

An even more important effect of higher transport costs in the long run may be to shift economic margins: Investors might view a certain natural-resource venture (a new oil discovery, for example, or a copper mine) to be economic if the netback value of the crude oil or ore reflected foreign-flag shipping costs, but as uneconomic if the wellhead or mine-mouth return had to absorb U.S.-flag shipping rates. Higher import costs for capital goods and for supplies used by industry may also help shift economic margins, making otherwise economic ventures unattractive to investors.

Although the Jones Act's economic effects are overwhelmingly negative for Alaska, there are few markets or aspects of Alaska's economy for which removal of the Jones Act structures would make much immediate difference. Except for the Railbelt area (Anchorage, Seward and Whittier, north through the Matanuska Valley to Fairbanks), the cost of ocean transportation is dominated by its seasonality or sporadic character, by the small scale of shipments, and by directional imbalance. For much of Alaska, it is not likely that the potential of competition from foreign-flag carriers would have much impact on costs.

The Railbelt, where most of Alaska's ocean-transportation demand originates, is served by a variety of shipping companies and modes of transportation. For the general mixed-merchandise trade in consumer goods and miscellaneous industrial supplies and building materials, the transportation business is highly competitive and continually changing. Containerized and roll-on/roll-off trailers seem to be the most efficient mode for most of this business and, as SH&E show, their costs are not strongly related to the nationality of the operations. Differences in the efficiency of shore-based activities can easily cancel out any difference in capital and manning costs between U.S.-flag and foreign-flag operations. Adding foreign-flag shipping companies to the present mix would in principle strengthen competition, but the true impact is hard to pin down.

The biggest cost impacts of the cabotage laws will be on commodities with low ratios of value to weight or bulk, where there is little practical alternative to oceanborne transportation. Crude oil is of course the outstanding example, and is Alaska's chief export commodity. Other Alaska bulk commodities -- ores, for example, may be seriously affected at some time in the future by the Jones Act cost penalty.

There are exceptions to the general rule that Alaska is a price-taker in its sales and a price-taker in its purchases. From 1973 to 1980, for example, Alaska-produced crude oil was subject to federal price ceilings at the wellhead. As a result, Lower-48 refinery prices for that oil were cost-plus prices, reflecting the regulated wellhead price plus transportation costs. (North Slope crude oil, however, was actually priced on a netback basis from 1977 through mid-1979 notwithstanding federal price controls, because the federal ceilings were higher than the market value of the oil.)

The pricing of petroleum products refined in Alaska is another exception to the rule that the Jones Act means higher prices for Alaska consumer goods. High transportation costs for crude oil exported from Alaska result in lower crude-oil costs for Alaska refiners, and at least potentially, lower petroleum-product prices for Alaska consumers, because the local refiners need only match the price of North Slope crude oil in outside markets less transportation -- as opposed to the combination of Lower-48 prices plus transportation that governs the Alaska prices of most consumer goods.

Those petroleum products produced by two or three of the Alaska refineries (jet fuel and distillate fuel oil) tend to sell in Alaska for less than West Coast prices, while motor gasoline (produced only by Tesoro) sells at somewhat more

than the Los Angeles price, but at less than the Los Angeles price plus transportation costs. For this reason, we doubt whether there is actually a "U.S.-flag premium of \$5.46 per long ton on petroleum products shipped north from Los Angeles."

Likewise, U.S. buyers seeking an Alaska product whose principal outlet is a foreign country must meet the Alaska export price and, in addition, bear whatever additional transport cost is involved. This situation probably applies to occasional shipments of Southeast Alaska logs or lumber to the Lower 48; thus the SH&E report may be in error when it attributes a \$3.41-per-ton Jones Act penalty on Southbound exports of Alaska lumber. The same situation likely applies to shipments of fresh and frozen king and chum salmon from the Bristol Bay area -- their prices are most likely determined by the offers of Japanese fish-buyers; Lower-48 buyers are price-tankers and must absorb whatever the transportation costs to the Lower 48 may be.

The fact that few shippers now seem to take advantage of either (1) their ability to bypass the Jones Act with purchases in Canada or (2) the exception for through shipments over Canadian railroads (and particularly the failure of a British Columbia to Whittier rail-barge service) leads us to a rebuttable presumption that the effective burden of the Jones Act on the railbelt's general-merchandise imports is not great.

ALASKA CRUDE-OIL ECONOMICS:
THE JONES ACT AND THE EXPORT BAN

The greatest Alaska impact of the Jones Act undoubtedly comes from its influence on the wellhead value of crude oil produced in the state.

The wellhead value of Alaska crude oil is a "netback" value, determined by subtracting transportation costs from the market value of the oil at the receiving refinery. In the world at large, therefore, Alaska-produced crude oil is a price-taker, and higher transportation costs between the field and the refinery are deducted almost penny-for-penny from the wellhead price.

SH&E estimate the reduction in the value of Alaska crude resulting from the Jones Act at about \$225 million per year, based upon present levels of production in Alaska and the recent destinations of Prudhoe Bay crude oil. They obtained this figure by a straight comparison between required freight rates (RFRs) on U.S.-flag and foreign-flag tankers on the Valdez-Los Angeles, Valdez-Panama, and Panama-Gulf Coast routes.

SH&E's figure of \$225 million is valid only as an hypothesis about the past or the future. It is an estimate of how much higher Alaska wellhead revenues would now be if the Jones Act had not been in effect when the companies made their transportation investments or, alternatively, how much higher they would be after the end of the present Jones Act tanker fleet's economic life, if the Jones Act were repealed or waived today. For the latter purpose, however, SH&E's estimate of the Jones Act premium on the basis of comparing U.S.-flag and foreign-flag RFR's is probably an understatement. These assumptions about the market for Alaska crude oil reasonably approximate the market's past operation, but they are unsuitable for projecting future prices.

In the emerging one-price system, only the transportation cost between the Alaska and the U.S. Gulf will affect the wellhead price of Alaska crude oil. Because the Jones Act penalty is greater on this longer route, therefore, its depressing effect on Alaska wellhead revenues will be considerably greater than estimated by SH&E. Using Jones Act and foreign-flag tanker RFRs on the Alaska-Panama and Panama-Gulf routes to determine the netback value of all Alaska crude oil would double the estimated Jones Act penalty, from \$225 million to \$450 million. If we also take the world tanker surplus into account, and compare Jones Act RFRs with foreign-flag running costs rather than foreign-flag RFR's, the estimated Jones Act penalty incurred

by Alaska crude-oil rises from \$310 million per year to \$630 million.

The state's direct share of additions or reductions in wellhead prices is now about 28 percent, including royalties, production taxes, and state income taxes on profits from crude-oil production and TAPS operations. Thus, depending upon the additional assumptions adopted, the state's direct revenue loss from the Jones Act ranges from \$65 million to \$176 million annually.

Summary. If both the Jones Act and the ban on exporting Alaska oil remain in place, the wellhead value of all Alaska oil will ultimately be the world market price at the US. Gulf less pipeline and Jones Act shipping costs between Alaska and the Gulf. If both restrictions are waived, the wellhead value of all Alaska oil will ultimately be the world market price in Japan less pipeline and foreign-flag shipping costs between Alaska and Japan. If exports are permitted and the Jones Act remains unchanged, the wellhead value of Alaska oil will still rise to the world market price in Japan less pipeline and foreign-flag shipping costs between Alaska and Japan, because producers would not be willing to sell Alaska oil into U.S. West Coast markets unless they got at least as much for it there as they would get by exporting it.

The federal government will capture more than 60 percent of any incremental revenues from Alaska crude-oil production, by means of the "windfall profits tax" and the corporate income tax.

Long-term impacts: shifting the economic margin. The most far-reaching impact of the cabotage and export-licensing laws on Alaska's petroleum economy will be their influence on company decisions whether and where to explore new acreage; whether, when, and how to develop new discoveries; and whether, when, how to invest in enhancing or prolonging the output from producing fields. The minimum wellhead prices needed to justify exploring or developing different oil prospects and discoveries in Alaska are certain to cover a wide range of values; and minimum economic prices measured at an Alaska tanker terminal will reflect the minimum wellhead price plus transportation to the terminal, and will therefore vary even more widely.

Four generalizations stand out about this menu of prospects and discoveries:

- (1) Only the largest, most prolific, and/or most favorably located oil discoveries in Alaska will prove to be commercial.

- (2) The high cost of transportation within and from Alaska means that, in most places, a field must have a finding and development cost at the wellhead in the \$0 to \$20 range, even if constant-dollar world oil prices remain at their recent high levels.
- (3) Because the wellhead value of Alaska crude oil is determined by subtracting transportation costs from market prices elsewhere, a small percentage change in the world price, or a transportation cost disadvantage that seems small relative to the refinery value of crude oil has a greatly magnified effect on wellhead values. If today's \$30 world price nets back to a seemingly adequate wellhead price of \$8 per barrel for some remote Arctic prospect, a 13-percent fall in the world price to \$26 would reduce the actual wellhead price by half.

Under the same conditions, a \$4 difference in the Alaska netback price of oil shipped to Japan in foreign-flag vessels, and the Alaska netback price of oil shipped to Louisiana (or anywhere in the U.S., for that matter, because the West Coast price will probably be determined in Louisiana) would be 50 percent of the expected wellhead price. And the lower an oil prospect's minimum economic price at the wellhead, the more sensitive its development-feasibility will be to the crude-oil's destination prices and transportation costs.

- (4) The economic-feasibility thresholds for Alaska's crude-oil discoveries and prospects are certain to occupy a wide and nearly continuous spectrum of prices. Any event or institution that adversely affects netback values -- even by "only a dollar or so" per barrel -- carries the risk of bumping some Alaska oilfield out of the "commercial" into the "non-commercial" category. The depressing effect of the Jones Act and the export prohibition on wellhead prices is sure sooner or later, to prevent development of some major discovery in Alaska.

Granted, the course of world oil prices and industry's expectations regarding world oil prices are just as crucial as transport costs to the economics of petroleum development in Alaska. At any plausible world oil-price level, nevertheless, there is bound to be some oil in Alaska that is worth developing if it can be exported in foreign-flag tankers, but which will be uneconomic to develop for shipment to the U.S. Gulf or East coasts in Jones Act Tankers. Different expectations about world oil prices will change the names of those borderline prospects, but some Alaska oil will always be on the economic margin.

CHANGES IN MARINE SERVICE BETWEEN ALASKA AND OTHER STATES

In the three years since Simat, Helliesen & Eichner, Inc., (SH&E) completed their report, Alaska has seen significant changes in the marine movement of goods and commodities to and from Alaska. In general, competition has increased due to new entrants into the shipping business and greater availability of tankers in the crude oil trade.

The SH&E report analyzed the movement of consumer goods between Pudget Sound and the railbelt ports of Anchorage and Whittier. This trade is currently extremely competitive. A new entrant has started service to a third railbelt port, Seward, using barges that carry highway vehicles (roll-on/roll-off service). In addition, a carrier providing rail-car barge service to Whittier has added a second deck to these barges and can now carry roll-on/roll-off vehicles too. The two carriers providing direct service to Anchorage have maintained their service levels in response to this competitive pressure, thus leading to an overall increase in service levels to the railbelt. The only potential decline in service may be due to the exit from the trade of barge carriers which formerly provided service to Anchorage from the Pacific Northwest.

The dominant impact on shipping costs of the Jones Act, according to studies prepared for the Alaska Statehood Commission, is on the shipment of crude oil from Valdez to refineries in the lower 48 states. The higher tariffs charged by Jones Act tankers lower the well-head price of North Slope crude. A lower well-head price decreases revenues to both the state and federal governments. In its analysis of the SH&E report, Arlon R. Tussing and Associates, Inc., estimated that the impact on state revenues, given certain assumptions, could be as high as \$176 million per year.

Shipping patterns in the movement of North Slope crude to market are shifting in favor of more movements by large, more efficient tankers. This shift is prompted by many factors, including a large number of unused tankers in the international market, the retirement of older tankers due to age, the requirements of the Port and Tanker Safety Act of 1978, and the completion of an oil transport pipeline across the Isthmus of Panama in late 1982. Surprisingly, a small portion of North Slope production does already move to market on foreign-flag tankers. Shipments of crude to refineries in the Virgin Islands are not required to move on the Jones Act fleet.

The most recent change in the crude oil trade south from Valdez is the expected entry of several large, modern tankers built under the Construction Differential Subsidy

(CDS) program. In a final rule adopted this spring, the U.S. Department of Transportation (DOT) allowed U.S. tankers originally built to serve the overseas trade to enter the domestic trade if their owners pay back the outstanding balance of construction differential subsidy. The CDS program was established to compensate vessel owners for the higher cost of building vessels in U.S. shipyards. Once built, these vessels were expected to be deployed in trade between the United States and other countries. The U.S. DOT rule allows these tankers, among the largest the most modern in the U.S. fleet, to enter the domestic (Jones Act) trade. This means that these tankers can transport North Slope crude from the oil terminal at Valdez to lower 48 ports and the Panama pipeline if their owners repay the outstanding subsidy.

Although the costs of using CDS-built tankers will still exceed the cost of using foreign-flag tankers, the entry of CDS tankers into the Alaska trade is expected to drive down the total cost of transporting North Slope crude to market. The major impact is that greater amounts of North Slope crude will be carried on large tankers with capacities in excess of 100,000 dead weight tons. The Department of Revenue estimates that the entry of CDS tankers into the trade will increase state revenues by \$38 million next year.

For revenue and other reasons, the Sheffield Administration strongly supported the revised CDS tanker rules described above. (See attachments.) In addition, representatives of the Administration expressed opposition to legislation introduced in Congress to block or significantly restrict these rules. The measure ultimately enacted permits the entry into the Alaska trade of several new and efficient CDS tankers.

BILL SHEFFIELD
GOVERNOR



STATE OF ALASKA

OFFICE OF THE GOVERNOR
WASHINGTON, D.C.

STATE OF ALASKA - POSITION ON JONES ACT

The Merchant Marine Act (Jones Act), which was adopted by Congress in 1920, prevents the transportation of goods between U.S. ports on foreign-built vessels unless there is an intermediary stop at a foreign port. The State of Alaska favors an amendment to the Jones Act which would allow foreign-built ships into the U.S. coast cargo and passenger trade, provided that they meet American safety standards, and are U.S. owned, registered, manned, and repaired.

The intent of the Jones Act was to protect American ship builders and operators from free market competition by foreign ships which have lower construction and operating costs. The concern was that otherwise the United States would not have a sufficient merchant marine fleet for wartime demands. If, however, under the State's proposal, foreign-built vessels were still U.S. registered and operated, then they would be available during wartime or other periods of national emergency.

As a result of the Jones Act protection, freight rates are very high in the U.S. coast trade. In fact, where competition exists from land-based transportation service (rail and truck), the Jones Act merchant marine fleet has declined dramatically in the past twenty years. Because Alaska, Hawaii, and the noncontiguous territories (except the Virgin Islands) have no significant alternative to the Jones Act fleet, they bear the penalty of higher freight rates. The Alaska trade alone supports nearly one-third of the entire Jones Act fleet.

The Jones Act penalizes the U.S. and Alaska in several ways:

- 1) It reduces federal and state oil revenues by effectively imposing higher tanker transportation charges which are tax deductible. (This will be ameliorated by proposed C.D.S. regulations by the Federal Department of Transportation).
- 2) It limits U.S. markets for Alaskan products (fish, coal, minerals and timber) by contributing to higher destination costs as compared with export to the Pacific Rim nations.

3) It raises the cost of all domestic freight coming into the State, thereby contributing to a higher cost of living and depressing economic development.

4) It depresses the tourism industry in the Pacific Northwest and Alaska by raising the cost of tourist passage from Seattle to Alaska and limiting the flexibility of cruise ship itineraries.

In the future, these penalties will become more severe. As U.S. ships are constructed to replace existing ships, the cost differential between U.S. and foreign ship construction will increase. In a subsidized environment, Alaska and the domestic purchasers of Alaska products will have no choice but to pay higher freight rates.

Our proposal would eliminate the most expensive and burdensome aspect of the Jones Act while ameliorating impacts on the maritime industry. We expect that a future increase in the construction of U.S. naval vessels will help offset business lost as a result of foreign competition for cargo vessel construction. Further, it is anticipated that lower marine freight rates will increase shipping business, thereby creating a need for more U.S. maritime and service-related employees.

It should be recognized that the high cost of American shipbuilding has in fact inhibited the growth and development of U.S. maritime commerce. Foreign-built cruise ships utilizing Canadian ports because of Jones Act restrictions still encounter significant limitations on their operations when they bring their passengers into Alaskan ports. Presently, the Alaska Marine Highway system must turn away thousands of tourist users and passengers because of lack of space. Yet foreign-built ferry vessels, which could be used to expand Alaska's ferry service for everyone's benefit, are available at lower cost.

June 30, 1983



STATE OF ALASKA
OFFICE OF THE GOVERNOR
WASHINGTON, D.C.

July 6, 1983

(The following letter was sent to the Chairman and Ranking Minority Member of the House Committee on Merchant Marine and Fisheries, its Merchant Marine subcommittee, and the Senate Committee on Commerce, Science and Transportation.)

Dear Senator/Congressman:

I have enclosed the State of Alaska's position paper on the Merchant Marine Act (the Jones Act) for use in the Merchant Marine and Fisheries Committee's deliberations on the various bills relating to the issue. The State favors amending the Jones Act to allow the use of ships built in foreign countries in the Alaska coast cargo and passenger trade, if they meet American standards and are U.S. owned, registered, manned and repaired.

Alaska is extremely dependent on water-borne commerce. While we favor the goals of the Jones Act, its strict application limits the number of ships available for commerce, resulting in unfairly high freight rates and an inflexible transportation system. We believe that our proposal will meet the primary goals of existing law while allowing entities such as cruise ships and the Alaska Marine Highway to better serve their users. In the long run, we believe our proposal will revitalize the shipping industry by enabling it to compete more effectively with alternate modes of transport.

I appreciate this opportunity to express the State's position on this important matter. If we can be of further assistance in your deliberations on the Jones Act, please contact us.

Sincerely,

/s/

Bill Sheffield
Governor

STATE OF ALASKA
OFFICE OF THE GOVERNOR
JEROME

June 7, 1983

The Honorable Mario Biaggi
Chairman, Merchant Marine Subcommittee
Committee on Merchant Marine and Fisheries
U.S. House of Representatives
Washington, D.C. 20515

Dear Congressman Biaggi:

Thank you for the opportunity to express the State of Alaska's position regarding H.R. 1076. This legislation, sponsored by Congressman Bonker, would repeal a section of the Jones Act (known as the 3rd proviso) which allows an exception to that Act for merchandise that is transported between points within the continental United States over routes recognized by the Interstate Commerce Commission which include a Canadian rail connection. This exemption was passed by Congress in 1958 as part of the legislation incorporating the Alaska Statehood Act extending to Alaska the same exception to the Jones Act available to a number of Great Lakes states.

The principal current use for this provision is trainship service from Prince Rupert, British Columbia, to Whittier, Alaska, and barge service from the Mackenzie River in Canada to the North Slope of Alaska in support of oil and gas activities at Prudhoe Bay. A trainship service is also under consideration from Vancouver to Seward. This new proposed service by Alaska Navigation Company has prompted an initiative to repeal the 3rd proviso as a means of protecting Seattle-based marine freight businesses from additional competition.

While the State of Alaska recognizes its primary dependence on the Seattle-based shippers, I do not agree that the utilization of the 3rd proviso, which has been in existence since statehood, poses a dire threat to these companies. In fact, they have flourished, while the 3rd proviso operations comprise a relatively small percentage of the Alaska marine freight business. Continued competition from 3rd proviso carriers is good for Alaska in that it maintains a greater diversity of cargo service and, perhaps, moderates the high cost of freight shipments to Alaska.

The Honorable Mario Biaggi

-2-

June 7, 1983

To the extent that elimination of the 3rd proviso would result in higher freight rates, I believe that H.R. 1076 weakens rather than strengthens domestic waterborne commerce. It is beneficial for Alaska to have the lowest possible freight rates and the greatest possible diversity of service to encourage its economic development. Ultimately, this will allow the shipping business to expand its business as partners in Alaska's growth. Less competition will produce the opposite effect.

Therefore, I cannot support H.R. 1076 in its present form since it would serve to increase the cost of goods to consumers in Alaska and would restrict our present means of maritime transportation.

- I appreciate your consideration of this issue of great importance to Alaska and to our nation's seaborne commerce.

Sincerely,


Bill Sheffield
Governor

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

OFFICE OF THE COMMISSIONER

JUL 10

ATTACHMENT 4

BILL SHEPPARD, GOVERNOR

POUCH 2
JUNEAU, ALASKA 99811
TELEX 45 3281
465-3900

Mr. Ed Gable
Chief, Carrier Rulings Board
U.S. Customs Service
Department of the Treasury
Washington, DC 20229

Dear Mr. Gable:

RE: Boeing Jetfoil
Demonstrations in Alaska

The State of Alaska recently completed a summer public demonstration and winter test of a Boeing Jetfoil to establish the feasibility of using a craft of this type for regularly scheduled passenger and freight service in southeast Alaska.

While the vessel demonstrated it can satisfactorily operate in the waters of Southeast Alaska, an analysis of the test results indicates to us that there is no credible method of estimating traffic volumes without a long term trial under actual operating conditions. Unfortunately, because of the restrictions of Title 46, U.S.C. (The Jones Act) now in effect, the only vessel suitable for continuation of a revenue analysis cannot be utilized. The Jetfoil in question, the ARIES, lost its privilege to engage in the coastwise trade because, although it was manufactured in the United States, it was sold to a foreign corporation and put in service under foreign registry for a period of approximately one year. Because of a default by the purchaser, the vessel has been returned to Boeing and is now home ported in Seattle.

The Alaska Legislature has made funding available to continue the trial operation of the Boeing Jetfoil. Therefore, we are, at this time, requesting an administrative waiver of the provisions of Title 46 U.S.C. to use the Boeing Jetfoil ARIES during the period from March 1, 1984 through March 1, 1985. If the State decides to initiate regular Jetfoil service, as a result of the trial operation, we would require the necessary vessels be built by U.S. manufacturers and be coastwise qualified.

The waiver requested, and the trials to be conducted, have implications far beyond passenger or freight service in Alaska. Both the National Security and High Technology impacts would be substantial. The enclosed copy of a letter from the manufacturer discusses these items in detail.

Your favorable consideration of this request will be appreciated. To enable us to make the commitments necessary to implement trial Jetfoil service in a timely manner, your decision in this matter by year end would be appreciated.

Sincerely,


Daniel A. Casey
Commissioner

Enclosure

cc: Ben Harding, Special Assistant to the Governor, Governor's Office
Jonathan W. Scribner, Acting Deputy Commissioner, Southeast Region, DOT&PF
Honorable Ted Stevens, U.S. Senate
Honorable Frank Murkowski, U.S. Senate
Honorable Don Young, U.S. House of Representatives
Robert E. Bateman, Boeing Marine Systems

DAC/RM/mjm



ASSISTANT SECRETARY

DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

NOV - 9 1983

Dear Mr. Young:

Thank you for the letter of October 5, 1983, sent by you and other Senators and Representatives concerning the request of the State of Alaska for a Waiver of 46 U.S.C. 883 to permit the use of a once foreign-registered Boeing hydrofoil for one year in the waters of southeast Alaska to test the feasibility of such a craft for passenger and freight service there.

It is my pleasure to inform you that Alaska's request for a waiver has been approved.

Thank you for your interest in this matter.

Sincerely,

John M. Walker, Jr.
Assistant Secretary
(Enforcement and Operations)

The Honorable
Don Young
House of Representatives
Washington, D.C. 20515

WILL SHEFFIELD
GOVERNOR



State of Alaska
OFFICE OF THE GOVERNOR
WASHINGTON, D.C.

December 31, 1984

MEMORANDUM

TO: DISTRIBUTION LIST

FROM: *JWK* JOHN W. KATZ, Director of State/Federal Relations
and Special Counsel to the Governor

SUBJECT: LEGISLATIVE ISSUES IN THE 99th CONGRESS

This memorandum outlines the components of the legislative program which Governor Sheffield has requested this office to pursue in the 99th Congress. The program is based on our analysis of federal issues of concern to Alaska, and on discussions with State officials, local governments, and interested groups. A number of related executive branch issues are also addressed. Not dealt with are legislative and administrative matters of a more mundane nature, which this office handles on a day-to-day basis. Budget and appropriation issues are covered in separate memoranda which have also been prepared.

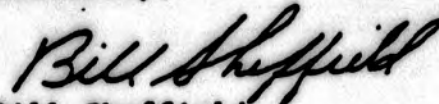
To facilitate your review, this memorandum is divided into three sections. The first part concerns legislation which was not enacted during the 98th Congress but which will likely be reintroduced next year. In most instances, we will advocate a State position based on our efforts in the past. The second section of the memorandum addresses legislation which will likely be introduced for the first time in the next Congress. Again, we have indicated the State Administration's position. The final section includes a selective listing of some of the nearly 700 public laws and administrative reports that will be considered by the Congress in the next two years. Except with respect to matters mentioned in the first two parts of the memorandum, items listed in the third section will probably require a lower level of attention by this office.

Page 2

Tax policy and the federal budget are two related issues currently receiving wide discussion in the nation's capital. Because of your likely interest in these subjects, I am enclosing our analyses of the Treasury Department's tax reform proposal and the President's proposed budget reductions for your information. A letter I sent last year to Senator Mathias' Subcommittee on International Economic Policy expressing the State's position on unitary taxation and my recent letter to President Reagan on Japanese trade issues may also be of interest to you.

If we can be of assistance in your work on federal issues, please do not hesitate to contact John W. Katz, director of my Washington, D.C. office, at (202) 624-5858, 444 North Capitol Street, N.W., Suite 518, Washington, D.C. 20001.

Sincerely,

A handwritten signature in cursive script that reads "Bill Sheffield".

Bill Sheffield
Governor



STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

January 14, 1985

Dear Legislator:

I am writing to acquaint you with the current work of my Washington, D.C. office, and to offer its services to you.

As many of you know, the office provides a focal point for Alaska's relations with the U.S. Congress and various agencies. It also conducts policy analysis, monitoring, and advocacy activities on specific state-federal issues. These presently include natural resources and energy, transportation, telecommunications, fisheries, taxation, education, health and human services, and environmental protection. Office efforts often entail the preparation of issue analyses, position papers, and communications to federal decision-makers.

As in the past, some of these efforts could be of assistance to legislative committees and individual legislators. Among other things, we would be glad to monitor issues of interest, prepare issue papers, and assist in scheduling trips to Washington for legislators and staff. The Washington office currently responds to requests from individual Legislative Informations Offices and is distributing some information on a regular basis.

I have enclosed two memoranda that will help provide an overview of the office's projected work on federal issues likely to affect Alaska during 1985. The first, entitled "Legislative Issues in the 99th Congress," outlines key issues before the Congress and the federal agencies, while the second, entitled "Federal Budget Priorities," explains the appropriation items of greatest interest to the State. A listing of my Washington, D.C. staff by area of responsibility is also included for your use.

Page 2

If you have any questions or comments regarding the issues addressed below, please let me know.

I. LEGISLATIVE ISSUES PENDING FROM THE 98th CONGRESS

A. OCS Oil and Gas Leasing Issues

1. OCS Revenue Sharing - In the 98th Congress, House-Senate conferees agreed upon legislation to share a small portion of OCS oil and gas receipts with all coastal states. The legislation was then passed by the full House of Representatives. However, Reagan Administration opposition prevented Senate consideration of the conference report. We anticipate that similar legislation will be introduced in the 99th Congress and that the State will advocate its passage. Alaska has been designated the lead state on this issue by the Western Governors' Conference.
2. 8(g) Revenue Sharing - Although further discussions between affected governors and Secretary Clark may occur, the issue of how to share Section 8(g) revenues will likely be decided in court. Congressman Breaux introduced a bill late in the 98th Congress to require a 50-50 split of all 8(g) revenues. His bill, which we believe the State should support, may receive a hearing. However, this legislation is unlikely to move in view of the fate of the more broadly-based, but financially-limited, general OCS revenue sharing legislation.
3. Coastal Zone Consistency Amendment - Legislation to rectify the U.S. Supreme Court opinion that excluded OCS lease sales from state coastal zone management review was favorably reported by the Senate Commerce Committee and was the subject of hearings in the House Merchant Marine and Fisheries Committee. Legislation similar to that which the State has supported previously will be considered in the 99th Congress, probably as part of the reauthorization process of the Coastal Zone Management Act (see New Legislative Issues).
4. OCS Lease Sale Schedule - The five-year OCS Schedule is due to be updated and presented to Congress for review during the 99th Congress. Barring any surprises, the key lease sale that might result in Congressional action, including funding moratoriums, is the proposed North Aleutian Shelf Sale now scheduled for December, 1985.

- B. Clean Water Act Reauthorization - With the failure of the Clean Water Act amendments in the 98th Congress, another attempt will undoubtedly be made in the 99th Congress. We anticipate four potential issues of interest to the State:
1. Legislation related to the pulp mills' request for a variance from effluent guideline standards - The State has previously advocated this approach.
 2. Changes to Section 301(h) which would restrict coastal communities' ability to discharge municipal wastes into certain marine waters - The State has previously opposed this change from existing law.
 3. Extension of Best Available Technology (BAT) requirements deadline to 1987 - Depending on final legislative language, the State will likely support this provision, in part due to its beneficial impact on the pace of needed investment by the placer miners.
 4. Changes to Section 404 regarding regulation of dredge and fill materials - We recommend monitoring and advocacy, if appropriate, of amendments developed by the State in the 98th Congress.
- C. Fish Marketing - Senator Stevens will most likely again press for the establishment of a National Fisheries Marketing Council to coordinate and expand the use of American fish products. Legislation accomplishing this end passed the Senate in the 98th Congress but was not acted on by the House. The State supports the measure.
- D. Fisheries Development - Two major efforts at promoting fisheries development will probably reappear in the 99th Congress. Senator Stevens' Capital Construction Fund, which would grant certain tax advantages to shore-based processors, and Representative Breaux's U.S. Fisheries Development Corporation, which would have broad responsibilities for fish-related loans, investments, and research. In addition, specific private sector fishery development proposals occasionally require advocacy at the D.C. level or with the Congress.

- E. Fish Management - Problems of State-federal fish management are dealt with in every Congress. They arise either from species specific multi-state conflicts, such as the precipitous decline of East Coast striped bass, or from conflicts between State-federal management regimes, such as those in Alaska over management of crab stocks. We will monitor these issues and assist in developing State positions as appropriate. (See Magnuson Act reauthorization in New Legislative Issues.)
- F. High Seas Salmon Interception - Japanese interception on the high seas of Alaska spawned salmon continues to be a serious problem. Bi-lateral negotiations with Japan will be necessary to correct the problem. We are advocating the initiation of such talks at this time.
- G. Glacier Bay Fishing - The wording of ANILCA and the Wilderness Act arguably could make commercial fishing in Glacier Bay illegal. Solutions to the problem have been considered, such as exempting the bay from the Wilderness Act, or exchanging the best commercial fishing wilderness waters for waters not now in wilderness. Eventually a legislative solution must be found or fishing in the bay could cease.
- H. Clean Air Act Reauthorization - Work will continue on efforts to reauthorize and amend the Clean Air Act. Acid rain continues to dominate this discussion. We will monitor this legislation and assist, as necessary, in the development of State positions.
- I. Oil Spill Superfund - Legislation which would provide a comprehensive nationwide system of limited liability and compensation for oil spills in federal waters passed the House but was not approved by the Senate. The House bill would affect state tax-based cleanup funds; since Alaska's fund is not tax-based, we are not adversely affected if the legislation remains in its current form.
- J. Exclusive Economic Zone - With the failure of the U.S. to sign the Law of the Sea Treaty, efforts have begun in Congress to assess future U.S. ocean policy and/or to implement an exclusive economic zone out to the 200 mile limit. These efforts will continue in the 99th Congress. The Governor has previously submitted a statement in support of the establishment of an EEZ.

- K. Teshepuk/Utukok National Wildlife Refuge - We anticipate that Congressman Dingell will reintroduce his bill to convert the NPR-A into a wildlife refuge. If so, we recommend that the State assess the results of BLM management of the area to date and devise a position accordingly. In the past, the State has informally opposed the Dingell bill, although the lack of Congressional action mooted the need to take a formal position.
- L. Universal Telephone Service - The FCC announced in December the implementation of a \$1 or \$2 per month access charge for residential subscribers for long distance service. It starts at \$1 per month in mid-1985 and increases to \$2 per month in mid-1986. This will generate substantial controversy due to its impact on consumers, especially those in rural areas. The House passed legislation last year blocking access charges and may make a similar effort this year. If remedial legislation is considered, the State should pursue specific Alaska amendments relating to reasonable telephone rates in bush Alaska and long distance service. Further, this office will work with the State's telecommunications counsel on administrative matters pending before the FCC, including rate integration and the existing supplemental.
- M. Industrial Development Bonds - The small issue IDB program sunsets December 31, 1986, except for bonds used to finance manufacturing facilities. This office will participate in a small issue coalition effort to extend the sunset past 1986. All activity will be coordinated with AIDA and the Commissioner of Commerce and Economic Development. Alaska has been designated the lead State on this issue by the Western Governor's Conference.
- N. Aleut Compensation - Congress failed to act on the Aleut compensation provisions in the House and Senate bills that resulted from recommendations made by the Commission on Wartime Relocation and Internment of Civilians. Our office actively supported the bills, and the Governor offered testimony at the Anchorage hearing. The primary reason the bill was not enacted was lack of consensus on the amount of compensation for Japanese Americans who were also covered under the bill. We expect a new effort in the next Congressional session.

- O. Federal Quiet Title Act Amendment - A U.S. Supreme Court decision in Block v. North Dakota held that states were subject to the 12 year statute of limitations in quiet title suits against the United States. A House Judiciary subcommittee held hearings in the 98th Congress on a bill which would exempt states from the provisions of the 12 year statute of limitations, but the committee took no further action. As was the case this year, our office will coordinate its efforts in the next congress with the Western Governors Association to secure a state exemption.
- P. Federal Tax Proposals - The Department of the Treasury issued a report which recommends to the President various tax reform measures. This includes a modified flat tax proposal which restricts deductions for state taxes and eliminates tax exempt private purpose bonds. There will be numerous tax simplification bills which, although they are intended to be revenue neutral, will affect certain classes of taxpayers. Proposals of particular interest include bills dealing with severance tax limitations, oil excise taxes, oil import fees, unitary tax, tax exempt bonds, deductibility of state or local taxes, federal corporate income tax, and limitations on state property taxes on interstate natural gas pipelines. Our office will monitor these initiatives and will advocate the State's interest where necessary.
- Q. Highway Funding Formulas and Related Issues - Legislation containing modifications to various highway funding programs, as well as approval of the Interstate Cost Estimate, stalled in conference in the 98th Congress. The State supported the Senate legislation and opposed the House bill. A variety of highway funding issues of interest to the State will be considered again in the 99th Congress, in particular formulas for allocation of construction and repair funds. In 1986, the entire Surface Transportation Assistance Act will require reauthorization.
- R. Jones Act Modifications - Legislation to eliminate the Third Proviso of the Jones Act, which allows foreign carriers to transport U.S. goods to Alaska via Canada, passed the House in 1983 despite strong opposition by the State. The Senate never acted on the measure. The legislation is likely to be reoffered again next year, with similar results. As a result of the approval of the initiative repealing the Alaska Transportation Commission, the State must lobby Congress for repeal of

the Jones Act, which requires goods being transported between points in the U.S. to be carried on U.S.-built, -owned, and -operated ships. Although we laid the basis for such activity in the past Congress, the chances for accomplishing anything in this area are not bright, as evidenced by the outcome of the proposal for a vastly more limited exemption for Alaska oil exports. Congress will also consider other maritime legislation of interest to the State, such as cargo preference proposals (which we have opposed in the past).

- S. Temporary (Transit) Visas - A provision was included in the controversial Simpson-Mazzoli immigration bill to allow travellers from certain countries to visit the U.S. without first obtaining a visa overseas. Although that provision was non-controversial, the bill's sponsors do not want it considered independently of the larger immigration bill, which stalled in conference, and will likely be considered again next year. We will seek separate consideration of the measure if the immigration bill appears stalled.
- T. National Park Protection - Legislation creating "buffer zones" around national parks was passed overwhelmingly by the House in 1983, but was not acted on in the Senate. However, such legislation is a top priority of some Senate members and of the environmental community, and will likely be taken up next year. Because of the size of Alaska parks, and the fact that the legislation addresses "lower 48" problems, we will oppose any bill which does not include an Alaska exemption, as we did in the last Congress. We will take a similar position on related legislation which would allow the imposition of admission fees in national wildlife refuges.
- U. 90-10 Revenue Sharing Formula for Alaska Wildlife Refuges - In 1983, Congressman Breaux offered an amendment in committee to repeal the provision of the Statehood Act which grants the State 90% of wildlife refuge mineral lease revenues. He proposed to replace it with the standard nationwide provision, which grants 75% of such revenues to the federal government for wetlands protection and 25% to the local county. Although he later withdrew the amendment, Congressman Breaux may offer it again. We would vigorously oppose it, as we did in 1983.
- V. Submerged Lands Statute of Limitations and Acreage Chargeability - The State, along with Native Corporations and the Department of the Interior, is

seeking legislation to require that the State and Native Corporations be charged for acreage conveyed to them by the Federal Government according to the standard rules of survey. This legislation would also repeal the statute of limitations for navigability challenges initiated by the State [Section 901(a) of ANILCA]. Although no bill was introduced to accomplish this in the 98th Congress (despite a request from the Governor for such legislation), the Interior Department's practice was successfully modified, and all key Congressional participants in the issue were thoroughly briefed and prepared for legislative action next year.

- W. Infrastructure Funding - In late 1984, House Public Works Committee leaders introduced legislation to provide funding to the states for infrastructure repair and construction. Such legislation will likely be a major issue in Congress next year. The State will be interested in how funding is allocated among the states.
- X. Oil Export/Export Administration Act Reauthorization - In the 98th Congress, a major effort to modify the North Slope oil export restrictions of the EAA foundered in the face of maritime industry opposition. Because the necessary reauthorization of the EAA was not passed by Congress, the issue could arise next year; a study of the oil export question by federal agencies is mandated by this legislation, if it passes. We will continue to advocate major modification of the current oil export restriction.
- Y. Food Stamps - During the last session of Congress, the House passed a food stamp bill, but the Senate failed to act. We expect food stamp legislation to be considered in the 99th Congress. The State obtained the inclusion of an Alaska-specific pilot program for a rural nutrition block grant. A food stamp block grant program as an option open to all states may be one of the alternatives discussed next year.
- Z. Indian Health Care Amendments - The Congress passed a reauthorization of the Indian Health Care Improvement Act last year, but the bill was not approved by the President based primarily on White House objection to a Montana pilot project and proposed IHS organizational changes. Alaska has special interest in the hepatitis-B provision, the Bethel IHS hospital provision, and the IHS contractor demonstration

DRAFT

February 20, 1985

The Honorable William von Raab
Commissioner
United States Customs Service
Room 3136
1301 Constitution Avenue, N.W.
Washington, D.C. 20229

Dear Commissioner von Raab:

I am writing in strong support of your proposed rule-making concerning the transportation of passengers on foreign vessels (FR 1060, January 9, 1985). We also commented favorably on the advance notice published in the April 25, 1984 Federal Register. The State favors actions such as this which beneficially affect the tourism industry in Alaska, because of the vital contribution it makes to our economy.

Existing U.S. Customs Service regulations (19 CFR 4.80(a)) limit the number and duration of U.S. stops by most cruise ships. Enabling ship operators to stop for longer periods of time and in a wider variety of locations would benefit Alaska and the nation in several ways. A number of Alaska communities which currently do not receive regular tour ship visits offer a great deal to the potential visitor and would welcome being included on tour ship itineraries. The proposed rule would enable cruise ships to make new stops at these ports, thereby boosting and diversifying those local economies.

Enhanced flexibility would also allow cruise ship operators to create a wider variety of tour offerings, including land/sea programs which would allow cruise passengers to visit major attractions in interior Alaska. In general, this flexibility would likely allow greater numbers of passengers to visit Alaska, since operators can better design schedules to attract potential visitors. The proposal would also benefit the nation by reducing the U.S. balance-of-payments deficit as a result of increasing visits to U.S. ports in lieu of foreign stops.

DRAFT

DRAFT

The Honorable William von Raab -2- February 20, 1985

For the reasons stated above, we urge you to formally adopt the proposed rule as soon as possible.

Sincerely,

Bill Sheffield
Governor

cc: The Honorable Ted Stevens, U.S. Senate
The Honorable Frank Murkowski, U.S. Senate
The Honorable Don Young, U.S. Congress
Regulations Control Branch
Ed Gable, Director, Carriers, Drawback & Bond Division

BILL SHEPFIELD
GOVERNOR



State of Alaska
OFFICE OF THE GOVERNOR
WASHINGTON, D.C.

February 14, 1985

MEMORANDUM

TO: THE HONORABLE TED STEVENS, U.S. Senate
THE HONORABLE FRANK MURKOWSKI, U.S. Senate
THE HONORABLE DON YOUNG, U.S. House of Reps.

FROM: *JWK* JOHN W. KATZ, Director of State/Federal Relations
and Special Counsel to the Governor

SUBJECT: GOVERNOR'S SCHEDULE

For your information, I have listed below a series of meetings involving the Governor and various federal officials during the former's upcoming trip to Washington, D.C. in late February. Topics to be discussed at one or more of these meetings include oil exports, transportation of Prudhoe Bay natural gas, section 8(g) of the OCS Lands Act, the State's Pacific Rim trade conference, and the North Aleutian Shelf lease sale.

With one or two exceptions, the date and time of each meeting has been finalized. Per your offer, I will let you know if any scheduling difficulties are encountered. In addition, there has been some discussion about the possibility of delegation members attending certain meetings.

Please let me know if you have any questions or comments regarding the proposed schedule.

Tuesday, February 26, 1985

1:00 pm

Dr. Alton Keel, Associate
Director, Office of Management
and Budget for National
Security and International
Affairs

Page 2

Wednesday, February 27, 1985

11:30 am - 12:00 noon

Allen Wallis, Undersecretary
of State of Economic Affairs.

11:30 am - 2:00 pm

John S. Herrington, Secretary,
Department of Energy.

3:00 pm - 3:30 pm

Donald Hodel, Secretary,
Department of the Interior.

Thursday, February 28, 1985

10:00 am - 10:30 am

Malcom Baldrige, Secretary
Department of Commerce.

1:30 pm - 2:00 pm

Erich Block, Director,
National Science Foundation.

NOTE: We are also seeking meetings with Raymond J. O'Connor, Chairman, Federal Energy Regulatory Commission and George Schultz, Secretary of State. In addition, coastal governors will be meeting with Secretary Hodel at some point to discuss issues arising under section 8(g) of the OCS Lands Act.

cc: John Shively, Chief of Staff

Meeting with Secretary Baldrige

Department of Commerce

Pacific Rim Conference

- Top level federal participation in the conference is essential for attracting the key policy-makers and business people from Japan, Korea, and China.
- Federal participation will enhance U.S. relations with invited conferees and stress national importance of relations with the invited countries.

Oil Exports

- Reagan Administration support is essential to Congressional action on the issue - Leadership needs to be displayed.
- A limited amount of export, on Jones Act tankers, would do little, if any, harm to maritime industry and would accomplish much in improving Japanese-U.S. relations. It would also have beneficial effects on the future products of Alaska oil - important for marginal field development.
- The increased wellhead value of Alaska oil, resulting from reduced transportation costs, would result in several hundred million dollars a year in additional federal Windfall Profit tax collections.

Natural Gas Export

- Export of North Slope natural gas is the only market possibility for that resource at this time. If the results of the Japanese-Arco pre-feasibility study are favorable, Congressional action may be necessary.

Timber Exports

- Alaska is actively pursuing possibility of marketing additional timber exports to mainland China. A brief description of your trip to China and subsequent events should follow.

Meeting with Undersecretary Wallis

Department of State

Pacific Rim Conference

- Top level federal participation in the conference is essential for attracting the key policy-makers and business people from Japan, Korea, and China.
- Federal participation will enhance U.S. relations with invited conferees and stress national importance of relations with the invited countries.

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- The increased wellhead value of Alaska oil, resulting from reduced transportation costs, would generate several hundred million dollars a year in additional federal Windfall Profit tax collections.

Natural Gas Export

- Export of North Slope natural gas is the only market possibility for that resource at this time. If the results of the Japanese-Arco pre-feasibility study are favorable, Congressional action may be necessary to authorize project.

Dr. Alton Keel

Office of Management and Budget

Oil Exports

- Reagan Administration support is essential to Congressional action on the issue - Leadership needs to be displayed.
- A limited amount of exports, on Jones Act tankers, would do little, if any, harm to maritime industry and would accomplish much in improving Japanese-U.S. relations. Exports would also have beneficial effects on the future production of Alaska oil - important for marginal field development.
- The increased wellhead value of Alaska oil, resulting from reduced transportation costs, would generate several hundred million dollars a year in additional federal Windfall Profit tax collections.

NOTE: See attached letter to David Stockman for further information.

Meetings with Secretary Hodel

Department of the Interior

North Aleutian Shelf Lease Sale

- The State has requested that the sale be delayed for a period of ten years or at least until 1994. The area contains unequalled natural resources, such as the Bristol Bay salmon fishery, marine mammals, and migratory birds. Delay will allow adequate time to fill data gaps identified by the State and give industry time to develop cleanup technology in case of an accident. Previous reductions in size of sale area and short term delays have not addressed these issues.

Oil Exports

- Reagan Administration support is essential to Congressional action on the issue - Leadership needs to be displayed.
- A limited amount of export, on Jones Act tankers, would do little, if any, harm to maritime industry and would accomplish much in improving Japanese-U.S. relations. It would also have beneficial effects on the future production of Alaska oil - important for marginal field development.
- The increased wellhead value of Alaska oil, resulting from reduced transportation costs, would result in several hundred million dollars a year in additional federal Windfall Profit tax collections.

Pacific Rim Conference

- Top level federal participation in the conference is essential for attracting the key policy-makers and business people from Japan, Korea, and China.
- Federal participation will enhance U.S. relations with invited conferees and stress national importance of relations with the invited countries.

Section 8(g) of the OCS Lands Act (if necessary in aftermath of Monday meeting).



STATE OF ALASKA
OFFICE OF THE GOVERNOR

Identical letters hand delivered to Senator Stevens and
Senator Murkowski on February 22, 1985.

February 21, 1985

The Honorable Don Young
U.S. House of Representatives
2331 Rayburn House Office Bldg.
Washington, D.C. 20515

Dear Congressman Young:

As you know, on November 6, 1984 Alaska voters approved a ballot measure (Initiative No. 83-02) which directed me to "seek repeal of federal statutes (the Jones Act) which require the use of United States vessels to ship goods between United States ports." I am writing to ask for your assistance in seeking this result.

The application of the Jones Act to Alaska has both increased the costs of all domestic freight shipped to and from Alaska and prevented the utilization of the most efficient available transportation options. By imposing higher transportation costs on domestic commerce, the Jones Act also discourages the development of new petroleum and mineral deposits in Alaska.

According to the Alaska Statehood Commission, the federal government loses from \$100-400 million dollars per year in oil revenues as a result of the higher transportation charges the Jones Act imposes on the movement of Alaska crude oil. The revenue loss occurs because transportation charges are deducted from the value of Alaska oil prior to the calculation of taxes. By reducing this value, the higher transportation charges also impede the development of marginal oil fields on Alaska's high cost North Slope.

Another serious problem with the application of the Jones Act to Alaska arises from the fact that it results in the strict separation of domestic and foreign waterborne commerce. Alaska could be economically served by vessels travelling from the U.S. Pacific Coast to the Orient. Western Alaska communities, with their severe employment

The Honorable Don Young -2-

February 21, 1985

problems, would particularly benefit from the ability to combine their domestic trade with this foreign service. However, the vessels currently providing international service are prohibited from stopping in Alaska by the Jones Act. Promising fishing ventures have been hampered by these restrictions.

Studies of the cost of the Jones Act to Alaska consumers have determined that approximately \$40 million dollars a year are added to the building materials, business supplies, and consumer goods shipped to Alaska. Given the existing high costs of living and working in Alaska, this additional burden is especially difficult for Alaskans to endure.

We understand the importance of the United States' cabotage laws and the necessity for a strong domestic merchant marine industry. However, Alaska is unfairly shouldering this goal by supporting about one-third of the entire Jones Act fleet, with the attendant effects of reduced resource development and higher costs. Nor has the Jones Act proved effective in stemming the decline of the U.S. merchant marine industry, which by relying on protectionism has lost business to other transportation modes and more efficient foreign ships and operators.

We realize that in the past Congress has shown no inclination to repeal the Jones Act. While recognizing the current situation, we would like to work closely with you in pursuing the objectives of the initiative. Toward this end, I will be in Washington, D.C. in late February and would like to discuss possible strategies with you at that time.

Thank you for your consideration of this important matter.

Sincerely,



Bill Sheffield
Governor

August 2, 1985

STATE OF ALASKA POSITION ON JONES ACT

BRIEFING POINTS

On November 6, 1984, Alaska voters approved a ballot measure (Initiative No. 83-02) which directed the Governor and the State of Alaska to "seek repeal of federal statutes (the Jones Act) which require the use of United States vessels to ship goods between U.S. ports."

1) The Jones Act reduces federal and state oil revenues by effectively imposing higher tanker transportation charges which are tax deductible.

2) According to the Alaska Statehood Commission, the federal government loses from \$100 to \$400 million dollars per year in oil revenues as a result of the higher transportation charges the Jones Act imposes on the movement of Alaska crude oil.

3) The Jones Act raises the cost of all domestic freight coming into the State, thereby contributing to a higher cost of living and depressing economic development in Alaska.

4) Studies of the cost of the Jones Act to Alaska consumers have determined that approximately \$40 million a year are added to the building materials, business supplies, and consumer goods shipped to Alaska.

5) The Jones Act limits U.S. markets for Alaskan products (fish, coal, minerals, and timber) by contributing to higher destination costs as compared with export to the Pacific Rim nations.

6) Alaska is unfairly shouldering this burden by supporting about one-third of the entire U.S. Jones Act fleet, with the attendant effects of reduced resource development and higher costs.

7) The Jones Act has not proved effective in stemming the decline of the U.S. merchant marine industry, which, by relying on protectionism, has lost business to other transportation modes and more efficient foreign ships and operators.

BFH



STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

December 26, 1984

The President
The White House
Washington, D.C.

Mr. President:

Because you will soon be meeting with Prime Minister Nakasone of Japan, I thought it would be helpful to provide you with recent information on Alaska's efforts to expand our trade with Japan. I would also like to discuss the implementation of the Joint Statement on Japan-U.S. Energy Cooperation issued by Prime Minister Nakasone and you on November 11, 1983.

Oil Exports

The Joint Statement provided that "the U.S. will continue to keep under review the removal of restrictions on exports of domestic crude oil." Your administration has completed several analyses on the subject, including a report recently released by the Federal Trade Commission. To our knowledge, all of these investigations concluded that easing existing restrictions on the export of Alaska North Slope crude oil would result in significant national benefits, including greater federal tax revenues, a reduced trade deficit with Japan, and the production of more Alaska oil at lower prices.

The reauthorization of the Export Administration Act is still pending in Congress. I respectfully urge you to follow through on the results of your Administration's studies of oil exports and actively assist our efforts to ease existing restrictions on the export of Alaska oil. To do so would be entirely consistent with your Administration's support for free trade and U.S. energy development. I believe that it would be timely for you to do this during the 99th Congress, since Congress has expressed an interest in obtaining your views on the matter.

On September 30, 1983 I wrote to let you know of our willingness to offer a portion of the State's royalty oil for export to Japan. From our discussions with interested

parties in Japan, I believe that the quantity of royalty oil available - 50,000 barrels a day - is an appropriate amount to consider at this time. You may also wish to discuss the issue with Prime Minister Nakasone in order to judge its current importance to Japan.

Natural Gas Exports

Progress has been made in assessing the viability of marketing Alaska's enormous North Slope natural gas reserves in the Pacific Rim. As proposed in the Joint Statement, study teams have been organized in the U.S. and Japan, thanks in part to the leadership provided by the Department of State. I offer you the full cooperation of the State of Alaska for any aspect of the study where we might be of assistance. Further, we believe that the study should be expedited as much as possible so that the results can be utilized in future decision-making regarding the export of North Slope natural gas, which our analyses indicates would be of significant benefit to Alaska and the Nation.

Coal Exports

I am also encouraged by the long-term coal contract that the Usibelli mine in Healy, Alaska recently signed with the Korean Electric Power Company. The Beluga and Matanuska fields contain substantial steam coal reserves that are easily accessible and have potential interest to Japan. Accordingly, we are hopeful that future U.S.-Japanese discussions will focus on the economic and other benefits which would accrue from increased trade in Alaska coal.

Fisheries

Currently, approximately five percent of our Nation's trade deficit is related to seafood products. Much of this is attributable to a trade imbalance with Pacific Rim countries, particularly Japan. To counteract this, the State has been working diligently to accomplish import substitutions by establishing a larger domestic market for Alaskan seafood. We are also endeavoring to domesticate as quickly as feasible the harvesting and processing of those species, such as groundfish, which have traditionally been utilized by foreign nations and then exported back to the U.S.

An annual meeting is held between representatives of the U.S. and Japanese fishing industries to discuss business relations, in particular with respect to groundfish. At this year's recently concluded meeting, an agreement was

reached for the 1985 fishing season which will increase the volume of product delivered by U.S. fishermen to Japanese processors in "over-the-side" joint venture operations. Even more importantly, the agreement also provides for the importation by Japan of approximately 7,000 and 20,000 metric tons of finished product which will be manufactured by U.S./Alaskan processors in 1985 and 1986, respectively. This sale of finished product to Japan, most likely surimi, will help stimulate a primary and secondary processing industry that will ultimately employ several thousand Americans.

Critical to the successful implementation of this agreement will be the ability of Japanese companies to import U.S. produced groundfish products. Current Japanese import quotas greatly restrict U.S. imports, while Japanese surimi exports to the U.S. are continuing to dramatically expand. Your insistence that the Government of Japan relax its fish-related tariff and import barriers would be useful in assuring the success of this industry-to-industry agreement which will have a beneficial impact on the U.S. balance of trade.

On another fish-related problem, recent studies have demonstrated that continued Japanese high-sea harvest of Alaska spawned salmon is seriously affecting the national harvest and management of this resource by Americans. We will be working through Alaska's Congressional delegation to encourage the U.S. State Department to initiate bilateral discussions with the Japanese which will be necessary to stop this deleterious practice.

Timber Exports

The timber industry in Alaska is geared to trade with Japan and the Pacific Rim. As a result, the Alaska industry is increasing its promotional activity in Japan. The State is working through its Alaska Asia Office in Tokyo to assist in the promotion of Alaska forest products and products made from Alaska timber in Japan.

To date, Alaska's spruce round logs and cants are selling well in Japan. However, there is a need to improve hemlock sales to Japan, as sales of hemlock products are currently reduced from previous years' totals. In another troubling area, South Africa, which has lower environmental standards and dramatically cheaper labor costs than Alaska, has captured an increasingly larger share of Japan's dissolving sulfite pulp markets from the United States, particularly

The President

-4-

December 26, 1984

Alaska. Any assistance which your Administration could provide to enhance Alaska's market share of hemlock, as well as to restore the U.S. and Alaska's share of the dissolving sulfite pulp market would be appreciated.

The State and industry are also working to formulate a plan to make attractive foreign investment in the development of Alaska's Interior timber resources. We will advise your Administration on the details of this plan when it is completed.

We very much support your efforts to expand trade with Japan and stand willing to help in any way. If you would like any additional information on our own efforts to increase trade with Japan, we would be pleased to provide it.

Thank you for your consideration of our views.

Sincerely,



Bill Sheffield
Governor

cc: The Honorable Ted Stevens, U.S. Senate
The Honorable Frank Murkowski, U.S. Senate
The Honorable Don Young, U.S. House of Representatives
The Honorable George Schultz Secretary, U.S. Department
of State
The Honorable Malcolm Baldrige, Secretary, U.S.
Department of Commerce
The Honorable William Clark, Secretary, U.S. Department
of the Interior
The Honorable Don Hodel, Secretary, U.S. Department of
Energy
William Brock, U.S. Trade Representative
David Stockman, OMB Director

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January 29, 1985

Mr. David A. Stockman
Director
Office of Management and Budget
Old Executive Office Building
Room 252
Washington, D.C. 20503

Dear Mr. Stockman:

I am writing to ask for your assistance in amending existing federal restrictions on the export of Alaska North Slope crude oil. Recent estimates by the Federal Trade Commission of the additional Windfall Profits Tax revenues accruing to the federal government as a result of lifting the ban range from 200 million to one billion dollars per year. I believe that any measure offering revenues of such magnitude deserves serious scrutiny by the President and Congress.

The enhancement in federal tax revenues from the export of Alaska oil results from reduced transportation costs. Half of North Slope production -- 800,000 barrels a day -- must undergo an expensive and inefficient journey to the U.S. Gulf and East Coasts, due to the surplus of supply on the West Coast. Reducing the transportation costs increases the wellhead value of the oil, on which taxes are based. This increase in value would also provide the oil industry with a greater incentive to develop currently marginal fields on the high-cost North Slope and to explore for additional oil and gas in northern Alaska.

Eliminating or easing Alaska oil export restrictions would also have other important national and international benefits. The existing trade deficit with Japan would be reduced while the U.S. would gain a bargaining tool to use on other trade issues. Opportunities for financially troubled countries, such as Venezuela and Mexico, to sell oil to the United States would be expanded by displacing Alaska oil from the Gulf and East Coasts. Finally, national security interests would be enhanced by diversifying the energy supply of key U.S. allies away from OPEC and the Soviet Union.

Mr. David A. Stockman

-2-

January 29, 1985

For the reasons stated above, groups as diverse as The Heritage Foundation, The Boston Globe, and The New York Times have endorsed the easing of restrictions on Alaska oil exports. However, the Administration has not conveyed a position on the issue to Congress. Your leadership in this matter is essential to ensuring that it receives proper consideration. In this regard, we have been advised by several members of Congress that the views of the Administration would be very important in their reexamination of the Export Administration Act provisions relating to Alaska oil.

I would like to meet with you to further discuss these issues in late February when I am in D.C. In the interim, please let me know if you have any questions. Thank you for your consideration of our views.

Sincerely,

Bill Sheffield
Governor

cc: The Honorable Ted Stevens, U.S. Senate
The Honorable Frank Murkowski, U.S. Senate
The Honorable Don Young, U.S. House of Representatives
Lee Verstandig, Assistant to the President

bcc: Attorney General Norman Gorsuch
Commissioner Esther Wunnicke, DNR
Commissioner Loren Lounsbury, DCED
Lennie Boston, Special Assistant
Ben Harding, Special Assistant
John W. Katz, Director, Washington, D.C. Office
John Greely, Press Secretary

July 12

July 12

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SEC. 136. ALASKAN OIL STUDY.

(a) REVIEW OF ALASKAN OIL POLICY.—

(1) IN GENERAL.—The President shall undertake a comprehen-
sive review of the issues and related data concerning possible
changes in the existing incentives to produce crude oil from the
North Slope of Alaska (including changes in Federal and State
taxation, pipeline tariffs, and Federal leasing policies) and pos-
sible changes in the existing distribution of crude oil from the
North Slope of Alaska (including changes in export restrictions
which would permit exports at free market levels and at levels
of 50,000 barrels per day, 100,000 barrels per day, 200,000
barrels per day, and 500,000 barrels per day), as well as the
appropriateness of continuing existing controls. Such review
shall include, but not be limited to, a study of—

(A) the effect of such changes on the energy and national
security of the United States and its allies;

(B) the role of such changes in United States foreign
policymaking, including international energy policy-
making;

(C) the impact of such changes on employment levels in
the maritime industry, the oil industry, and other indus-
tries;

(D) the impact of such changes on the refiners and on
consumers;

(E) the impact of such changes on the revenues and
expenditures of the Federal Government and the govern-
ment of Alaska;

(F) the effect of such changes on incentives for oil and gas
exploration and development in the United States; and

(G) the effect of such changes on the overall trade deficit
of the United States, and the trade deficit of the United
States with respect to particular countries, including the
effect of such changes on trade barriers of other countries.

(2) FINDINGS, OPTIONS, AND RECOMMENDATIONS.—The Presi-
dent shall develop, after consulting with appropriate State and
Federal officials and other persons, findings, options, and rec-
ommendations regarding the production and distribution of
crude oil from the North Slope of Alaska.

(b) CONSULTATION AND REPORT.—In carrying out subsection (a), the
President shall consult with the Committees on Foreign Affairs and
Energy and Commerce of the House of Representatives and the
appropriate committees of the Senate. Not later than 9 months after
the date of the enactment of this Act, the President shall transmit to
each of those committees a report which contains the results of the
review under subsection (a)(1), and the findings, options, and rec-
ommendations developed under subsection (a)(2).

TITLE II—EXPORT PROMOTION PROGRAMS

SEC. 301. REQUIREMENT OF PRIOR AUTHORIZATION.

(a) GENERAL RULE.—Notwithstanding any other provision of law,
money appropriated to the Department of Commerce for expenses to
carry out any export promotion program may be obligated or ex-
pended only if—

Employment
and
unemployment.

Commerce and
trade.

President of U.S.

President of U.S.
Report.

15 USC 4051.

THE EXPORT OF OIL TO JAPAN - STATE REVENUE IMPACTS

Recent trade negotiations between the U.S. and Japan have suggested a reexamination of the desirability of lifting the current ban on the exportation of Alaska North Slope (ANS) crude oil. Many issues are raised by such a proposal, most of which are political rather than economic, although there would be major financial impacts on all parties currently involved in the Alaska oil trade.

The export ban was enacted by Congress at a time of a growing realization, fueled by the Arab oil boycott, of U.S. dependence on foreign sources for crude oil. The perceived need for domestic oil spurred Congress to overcome the staunch environmental opposition to the permitting for construction of the Trans Alaska Pipeline System. The ban on exports of ANS was an important compromise hastening the passage of enabling legislation to build TAPS.

The current and continuing controversy over exports of ANS reflects opposing views on the benefits and costs of such a move. Briefly, the rationale in favor of export is essentially that Alaska oil could be sold to Japan and any additional imports into the U.S. would be supplied from sources closer to the U.S. Gulf than Alaska, like Venezuela or Mexico. The primary benefits would derive from the increased revenues to the Federal Government, oil producers, and the State of Alaska because of a higher wellhead price for North slope production, due to the much lower cost of shipping oil from Valdez to Japan than from Valdez to the U.S. Gulf. Additional economic benefit would result from the positive effect on the U.S. foreign trade account.

Opponents to allowing exportation of ANS claim it is counter to the national security since the Alaska oil trade supports virtually the entire domestic tanker fleet. They believe that removal of this maritime industry protection will not only deprive the U.S. of a strong domestic fleet but will result in massive financial disruption due to loan default, and will penalize shippers who have made large investments in transportation infrastructure from Alaska to the U.S. Gulf.

To date, the State of Alaska has refrained from taking a strong advocacy position on this issue since it is a very political one in which the State is an easily identifiable beneficiary of removal of the export ban. Interestingly, consumers would not be directly affected by the legislation, although economic theory suggests that free trade would result in the consumer ultimately sharing in the resulting cost saving due to the increase in market efficiency ANS export would engender.

In any event, the purpose of this brief discussion is to examine the revenue implications for the State of Alaska and no attempt is made to evaluate the benefits, costs and redistributive consequences of removal of the export ban.

In order to estimate the State revenue impact of ANS export, the three following basic questions are addressed:

1. What transportation cost savings would be realized?
2. How much oil would be shipped?
3. What price would ANS sell for in Japan?

Transportation Cost Savings

To start with, it is not certain whether exported ANS would be shipped in foreign or American Flag tankers. If either some, or all, oil is shipped in American flag or "Jones Act" tankers, cost savings will be less owing to the higher operating costs of these tankers. Allowing export also raises questions about the impacts on the domestic tanker market.

The number of domestic tankers needed naturally depends both on the conditions of export and on the amount shipped. The export of ANS would require, in aggregate, fewer ton miles of transportation service to move Alaska crude to market since the route to Japan is much shorter than to the Gulf Coast of the United States. This will tend to reduce tanker demand domestically. As a result, newly idled tankers would presumably increase the competition for carriage of domestic oil, thus tending to lower rates to all markets, including the Gulf. It should be mentioned at this point that it is also not clear what impact, if any, the opening up of the Japanese market would have on the domestic oil market. In particular, West coast refiners would in a sense be bidding against the Japanese for ANS. The magnitude of the effect on price would depend on the cost of alternative imported crude oils. Owing to the lack of empirical evidence on the relevant supply and demand elasticities, no attempt is made to incorporate these "pecuniary externalities" into the cost savings estimates or higher wellhead values due to impacts on domestic crude oil prices.

Finally, from the oil producers point of view there will be major up front costs to ship to the Japanese market, including the renegotiation of transportation commitments to serve the new market. Company marketing flexibility is also somewhat limited owing to current long term commitments to the Trans Panama pipeline and existing tanker chartering agreements. These costs are not considered explicitly in the analysis but hopefully are reflected in export volume scenarios.

How Much Would Be Shipped

This is not an easy question to answer since it will depend on a number of factors already alluded to. Simply stated, it will depend on the price the Japanese are willing to pay, which in turn depends on the price of alternative world crude oils, the amount the companies are willing to sell, and whether Alaska would opt to sell its in-kind royalty oil to Japan.

Given the domestic tax environment (particularly the Windfall Profits Tax) and the generally high price of imported crude oil, it could be expected that integrated producer refiners on the West Coast would desire to export

only those amounts of ANS in excess of their current refining needs. Gulf refiner-producers of ANS would presumably just as soon swap and sell to Japan any ANS surplus to West Coast needs, saving the transportation cost to the Gulf. The State of Alaska currently receives royalty income from North Slope production, roughly 200 thousand bbls/day, some of which could readily be available for sale in the Japanese market. Political considerations with respect to in state use would be the main facet of this potential source of export.

Currently, prices of internationally traded crude oil are somewhat higher than the average delivered West Coast and Gulf price of ANS crude oil. Short of a major international price war, or the implementation of an import fee on foreign crude entering the U.S., domestic U.S. crude oil prices should bear a close resemblance to world crude oil prices since the U.S. is the major international "free world" market. Hence, it is unlikely that in order to sell to Japan at a competitive price the transportation cost savings would be negated as a result of Japanese price far lower than the U.S. delivered price.

ANS Sale Price in Japan

To answer this question we would need to know the ability of the Japanese refinery sector to process ANS and the current requirements of Japan for crude oil vis-a-vis existing contracts with other crude oil exporting countries. Most likely Japan would not mind dropping recent contracts with Iran, given the high costs of dealing with that particular country. Whether there would be substantial quality discounts for ANS compared to say Iranian or other international sources of crude oil, is again related to Japan's refining industry configuration.

REVENUE SENSITIVITY ANALYSIS

In order to examine potential State revenue impacts, three basic scenarios for State royalty oil are examined. The first calculation examines the impacts of Alaskan in-kind royalty sales alone. The second estimates the incremental impact on in-value royalties and severance tax collections resulting from producer sales. The third scenario of royalty disposition calculates revenue impacts for in-kind sales of 100 thousand bbls/day and further sales by ANS producers resulting in additional in-value royalty payments and severance tax collections.

The revenue impacts for each scenario are determined by further assumption about transportation cost savings and the sales price of ANS in the Japanese market.

Calculation of Transportation Cost Savings

In order to make this calculation, assumptions must be made about the cost of shipping crude oil from Valdez to Japan. This cost can then be compared to the cost of current shipments from Valdez to the U.S. Gulf.

Table A
Representative Tanker Cost
Valdez to Yokohama/U.S. Gulf

	<u>Valdez to Yokohama</u>	<u>Valdez to U.S. Gulf</u>	<u>Tanker Cost Savings Japan vs. U.S. Gulf</u>
Foreign Tanker	\$.62/bbl ¹	----	\$3.89/bbl
Jones Act Tanker	\$1.95/bbl ²	\$4.52/bbl ³	\$2.57/bbl
50% Jones Act Tanker	\$1.29/bbl	----	\$3.23/bbl

Increase in Wellhead Value ANS

In order to calculate the revenue impact of the export of ANS to Japan assumptions must be not only about transportation cost savings but also about the selling price of ANS in Japan. Three alternatives are assumed:

- A. ANS price = delivered price Iran Heavy
at Japan light to Japan
= \$28.25/bbl (March 1983)
- B. ANS price = ANS price
at Japan at U.S. Gulf
= \$27.00/bbl (March 1983)
- C. ANS price = ANS price
at Japan at U.S. Gulf less \$1.00/bbl

For reference, price A represents a premium case, the price B represents a neutral case, price C represents a discount case which could be interpreted as reflecting the imposition of an import fee on crude oil into the U.S.

-
- ¹ Foreign Tanker rate is for Long Range 2 tankers July 1982 World Scale and September 1982 AFRA index for Kenai to Yokohama (export of LNG Alaska to Japan.)
 - ² American Flag Tanker rate Valdez to Yokohama.
 - ³ Average reported transportation cost to U.S. Gulf by producers of Alaska North Slope crude for State severance tax purposes.

Table B illustrates the net increase in ANS wellhead price combining the tanker cost savings shown in Table A with the price assumptions made about the selling price of ANS in Japan.

Table B

Net Increase Value ANS Wellhead (\$/bbl)

<u>Tanker Alternative</u>	<u>Price Premium</u>	<u>Price Neutral</u>	<u>Price Discount</u>
Foreign	\$5.14/bbl	\$3.89/bbl	\$2.89/bbl
Jones Act	3.82/bbl	2.57/bbl	1.57/bbl
50% Jones Act	4.48/bbl	3.23/bbl	2.23/bbl

Case 1 - State Revenue from Sale of State In-Kind Royalty Crude Oil to Japan.

A key assumption from the standpoint of State of Alaska revenue impact is whether the State takes an active role in marketing its royalty share to Japan. The following table illustrates the revenue impacts if the State sold varying amounts of its current 200 thousand bbls/day production share of ANS to Japan.

Table C

State Revenue From the Sale of Alaska Royalty
Crude Oil to Japan (Millions \$/year)

	<u>Tanker Alternative</u>	<u>Volume Sold</u>	
		<u>100 Mb/d</u>	<u>200 Mb/d</u>
Price Premium:	Foreign Flag	\$187.61	\$375.22
	Jones Act	139.43	278.86
	50% Jones Act	163.52	327.04
Price Neutral:	Foreign Flag	\$141.99	\$283.98
	Jones Act	93.81	187.62
	50% Jones Act	117.90	235.80
Price Discount:	Foreign Flag	\$105.49	\$210.98
	Jones Act	57.31	114.62
	50% Jones Act	81.40	162.80

Case 2 - State revenue From In-Value Royalties & Severance Tax Assuming Producer Sales to Japan.

An alternative case would presume that the State sells none of its royalty directly to Japan but the producing companies do sell and the State collects increased in-value royalties and severance taxes. This case is illustrated in Table D.

Table D
State Revenue Impact From Producer
Sales of Crude Oil to Japan (Millions \$/year)

	<u>Tanker Alternative</u>	<u>Volume Sold</u>		
		<u>100 Mb/d</u>	<u>200 Mb/d</u>	<u>500 Mb/d</u>
Price Premium:	Foreign Flag	\$ 47.83	\$ 95.66	\$239.14
	Jones Act	35.55	71.09	177.75
	50% Jones Act	41.69	83.37	208.44
Price Neutral:	Foreign Flag	\$ 36.20	\$ 72.40	\$181.00
	Jones Act	23.91	47.82	119.55
	50% Jones Act	30.06	60.12	150.30
Price Discount:	Foreign Flag	\$ 26.89	\$ 53.78	\$134.45
	Jones Act	14.61	29.22	73.05
	50% Jones Act	20.75	41.50	103.75

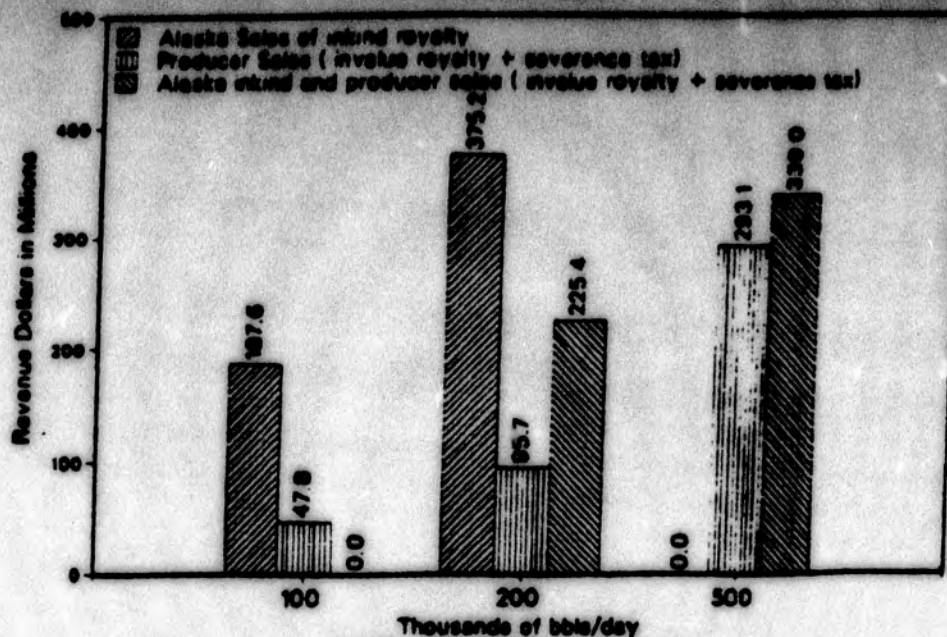
Case 3 - State Revenue From 100 Thousand bbls/day In-Kind Sales and Additional Producer Sales to Japan.

The final case illustrated involves both sales of 100 thousand bbls/day of Alaska royalty crude directly to Japan and sales of company owned crude.

Table E
State Revenue Impact from Sales of
Both Royalty In-Kind (100 Mb/d) and Company
Owned Crude Oil to Japan

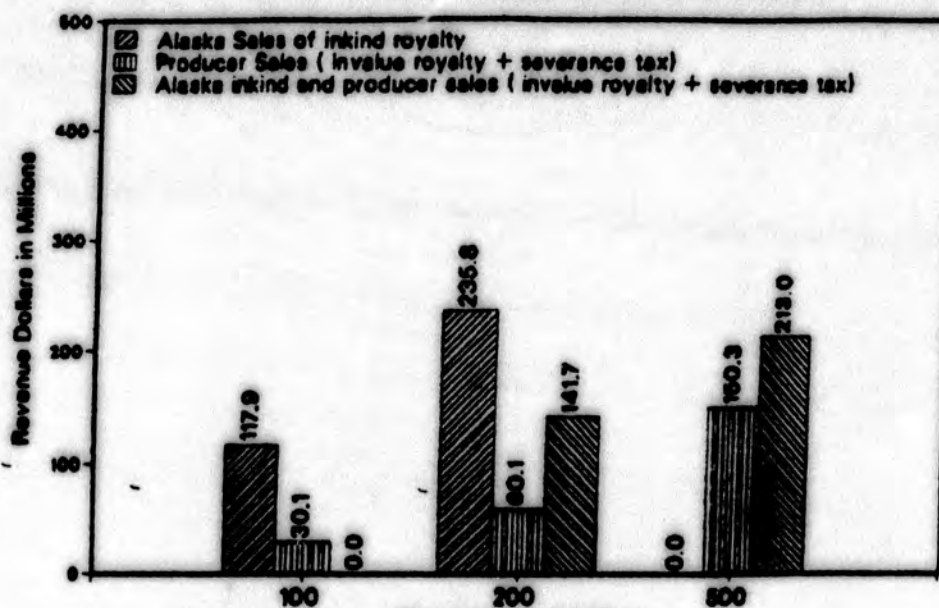
	<u>Tanker Alternative</u>	<u>Total Volume Sold</u>	
		<u>100 Mb/d</u>	<u>200 Mb/d</u>
Price Premium:	Foreign Flag	\$225.45	\$338.97
	Jones Act	167.55	251.92
	50% Jones Act	196.50	295.44
Price Neutral:	Foreign Flag	\$170.62	\$256.54
	Jones Act	112.72	169.48
	50% Jones Act	141.67	213.01
Price Discount:	Foreign Flag	\$126.76	\$190.59
	Jones Act	68.86	103.54
	50% Jones Act	97.81	147.06

The following bar charts illustrate in summary form the information contained in the previous tables. The Low Revenue Case assumes that ANS is shipped to Japan in Jones Act Tankers and sells for a \$1.00/bbl discount in Japan relative to what it would sell for at the U.S. Gulf. The Medium Revenue Case assumes that ANS is shipped to Japan 50% in Jones Act tankers and 50% in foreign tankers and sells for the same price it would fetch in the U.S. Gulf. The High Revenue Case assumes ANS is shipped to Japan in foreign tankers and sells at the same price as delivered Iranian Heavy (currently a \$1.00/bbl premium over U.S. Gulf price).



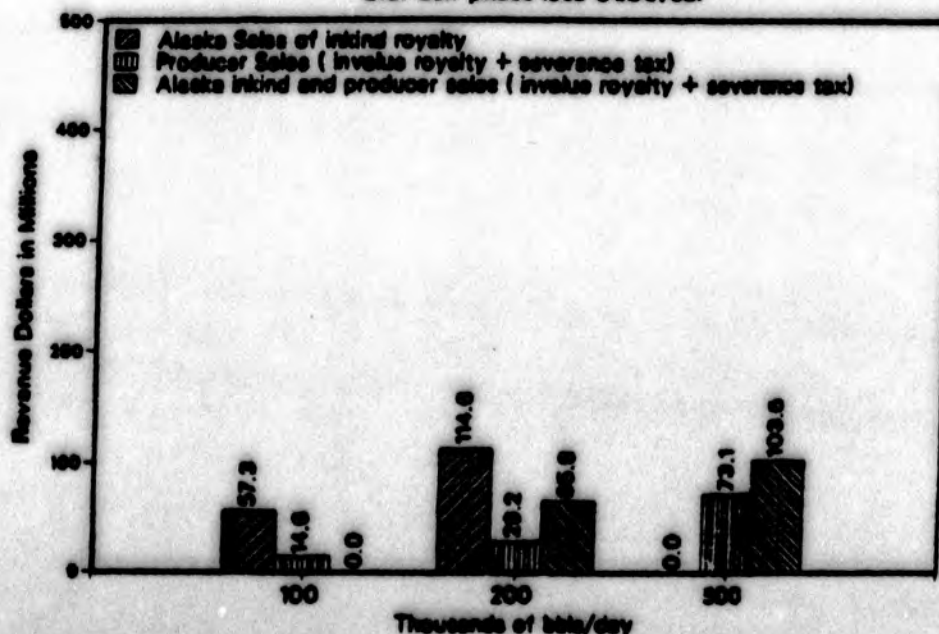
MEDIUM REVENUE CASE

50% Jones act tankers, ANS price = U.S. Gulf price



LOW REVENUE CASE

Jones act tankers, ANS price = March 1983
U.S. Gulf prices less \$1.00/bbl



Summary and Conclusions

The foregoing analysis suggest that under a wide range of assumptions the State of Alaska would enjoy revenue increases should the current ban on exports of ANS be removed. Though the impact illustrated ranges between \$10 and \$500 million per year, given the current market situation, the current commitments of the companies to the Trans Panama pipeline and currently uncommitted Alaska royalty crude, the best guess revenue impact would probably be about \$50 to \$100 million per year.

The export of ANS would offer the following benefits:

1. It improves our balance of trade.
2. It helps balance the federal budget by dipping into Japanese pockets rather than the U.S. citizen's pockets.
3. It improves revenues to North Slope producers and makes increased North Slope development even more attractive.
4. It increases State of Alaska revenues.
5. It puts increased pressure on OPEC to lower their prices.

However, the parties negatively impacted by such a change in national policy are probably politically powerful enough to block any move to allow export of ANS crude oil.

Gregg Erickson

THE EXPORT OF ALASKA CRUDE OIL
ITS SIGNIFICANCE FOR
PACIFIC BASIN PETROLEUM TRADE

by
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Introduction

The collapse of world oil prices is a catastrophic blow to crude-oil producers, but it will be a boon to international trade. Lower prices will have two distinct effects. Firstly, substantially lower petroleum product prices will stimulate energy demand. In turn, most energy-demand growth will be met by imported oil, which will be the least costly fuel at the margin for most applications in most markets. Refineries in oil-exporting countries will finally become profitable and will intensify global competition in petroleum-product markets.

Secondly, lower prices and abatement of fears concerning future energy shortages will enhance the incentives for oil-consuming nations to relax trade barriers for crude oil and petroleum products. The result will be a reduction in both transport and processing costs and a gain in economic efficiency. With lower prices, the waste entailed by oil-export restrictions in the United States and Canada will be economically, and hence politically, intolerable. The shift in North American policies will have an impact on petroleum trade throughout the Pacific Basin.

If the United States allows Alaska crude oil to be exported, higher West Coast prices will provide an incentive to export Alberta crude to the state of Washington. Light low-sulfur import crudes from Indonesia and other Pacific Rim countries will find a viable market in California.

Trade in petroleum products will increase. The U.S. will increase its export of high-sulfur fuel oil and increase imports of gasoline and other light fuels.

Significance of World Oil-Market Conditions

Fundamental supply-demand conditions in the world oil market are consistent with price swings as low as \$5 per barrel and as high as \$25 (in 1986 U.S. dollars) over the next decade. But it is Saudi Arabia's market share that will determine whether average prices will settle toward the high or low end of this scale. If the demand for Saudi oil is low relative to the Kingdom's revenue needs, the Saudis will be forced to compete with other oil suppliers rather than with suppliers of other fuels. The world's oil producers may find themselves in a similar situation to U.S. natural-gas producers who, in the last few years, have been faced with "gas-to-gas" competition because their product has been abundant enough to drive rival energy forms (chiefly heavy fuel oil) from ready fuel-switching markets. Under certain conditions, "oil-on-oil" competition could last for a decade. Sooner or later, however, because Middle Eastern oil has a lower marginal development and delivery cost than almost any other energy source (including oil produced elsewhere), the Saudis will regain their position as swing producer.

When there is significant demand for its crude oil, Saudi Arabia will set its price by focusing on the B-fuels market¹, where gas, oil and

1. We use the term B-fuels market as short for those uses that are variously tagged as "bulk-fuels", "boiler-fuels", or "black fuels". It refers to fuels uses in which the object of demand is calories as such, and in which residual and other heavy fuel oils actively compete with coal, natural gas, and other energy sources. In the United States, these markets are most often referred to as boiler-fuel markets, although the uses in question comprise extend much further than the raising of steam for electrical generation and other industrial purpose, to include distillation of a host of substances, melting and drying of bulk materials, metallurgy and other large-scale industrial process heat. A decade ago in Europe, it was fashionable to call these uses the black fuels markets, but supplies are no longer confined to coal and heavy fuel oil, but include natural gas, uranium, municipal waste, and vegetation. For those who prefer to use whole words, bulk fuels is probably the most accurate term.

coal compete. Put another way, the marginal supplier of energy to the world will base its price on the marginal uses of energy and the marginal development costs of fuels competing in that market. The Saudis have almost no economic incentive to limit production or restrain development of their fields, because their oil will never be worth much more than the value of substitute B-fuels.

As late as 1972, the major oil companies forecast Saudi crude oil production of 20 million barrels per day. Such an output is still possible, and the investment required to arrive at that level of production is an order of magnitude less than the cost to consuming nations of providing a similar increment in primary-energy supply from other resources. It is a good bet that the Saudis now realize that higher levels of capacity should have been installed in the mid-1970s, in order to prevent the price runups of 1979 and 1980 (which they themselves wittingly or unwittingly engineered by holding back on production). In short, Saudi Arabia has both the incentive and the ability to meet the world's incremental energy demand through the rest of this century.

Saudi Arabia will price its energy just below the costs of its closest competitors. In the short-run the competition is other sources of oil, plus natural gas in North America and Europe, where the long-distance transmission infrastructure is more than adequate to meet current demand. In the longer-run the competition is from coal and new natural gas supplies (including the substantial cost of adding new transport capacity).

In our view, oil prices are most likely to range between \$10 to \$15 through the early 1990s. It is important to note, however, that as long as the crude market is driven by netback sales arrangements, crude-oil prices are going to fluctuate sufficiently that periodic excursions below \$10 or above \$15 should not be surprising. In other words, seasonal demand swings and the moods of traders and speculators will have a more profound influence on crude-oil pricing patterns than in the past. This volatility in itself will promote trade, as brokers, importers and refiners adjust inventories to take advantage of seasonally and randomly cycling prices.

The West Coast Oil Surplus

The Prudhoe Bay oilfield was discovered in 1968. Its 9.6-billion barrels of proved reserves were a dramatic addition to the U.S. total. Until that time, West Coast oil reserves were only about 15 percent of the national inventory; with the determination that Prudhoe Bay was a commercial discovery, they came to account for 40 percent.

In subsequent years, the delay in completing the Trans-Alaska Pipeline System (TAPS) kept West Coast reserves from declining at the same proportionate rate as those East of the Rockies. In addition, the development of other giant crude-oil fields in Arctic Alaska (for example, the Kuparuk, Lisburne, and Endicott), the discovery of the offshore Santa Maria field near Santa Barbara, and the progress in thermally enhanced oil recovery (TEOR) for heavy California crudes has focused national attention on West Coast oil resources. One major oil company estimates that three-quarters of all the reserves yet to be developed in the United States will be in California and Alaska.

In short, the development of West Coast oil supplies has strategic implications. This has an important bearing on the regulatory environment likely to be faced by California and Alaska oil producers, since investments in future production are now threatened by the collapse in prices.

Since January 1981, when the U.S. system of oil-price controls was terminated, most oil markets have developed a structure in which crude-oil price differentials are a rational function of quality and transportation costs. The most glaring remaining anomaly in North America stems from the U.S. federal prohibition on crude-oil exports. While this regulation affects every domestic oil producer, it is only on the West Coast that it has an important economic impact.

The discovery at Prudhoe Bay stirred a vehement debate over how and where the oil should be shipped. The industry experimented with icebreaking tankers, but finally concluded that overland pipelines were the only practical transport means. Congress had to authorize construction of the pipeline since it crossed federal lands and required a wider right-of-way than permitted under existing law. West Coast

conservationists, concerned about environmental damage from marine crude-oil spills, wanted to prevent tanker movements along their shores, while Congressmen from the Midwest wanted a pipeline to go through Canada into the Chicago area. All parties acknowledged that such an overland pipeline would have lower unit transport costs in the long run, but its initial capital cost would have been considerably higher, and the industry balked. The North Slope producers preferred to ship the oil to a deepwater port on the south coast of Alaska, where it could be sent by tanker to Puget Sound, California and other markets.

Some members of Congress feared that the export of Alaska oil to Japan, Korea and other Asian countries would disadvantage U.S. refineries and its Merchant Marine. Spite from midwesterners deprived of their own pipeline link and from conservationists resentful of legislation that bypassed the newly enacted National Environmental Policy Act, joined with the protectionist interests to enact a prohibition of such exports in the Trans-Alaska Pipeline Authorization Act of 1973. Congress extended the prohibition to all domestically produced crude oil in 1979 amendments to the Export Administration Act.

The impact of this federal legislation is clearly evident in U.S. supply and distribution statistics as well as in the pricing of Alaska and California crude oil. Since TAPS was completed in 1977, the West Coast has had surplus crude-oil production. This situation is illustrated in Figure 1. Until then, there was net flow of petroleum products from other regions. Following the attachment of Alaska North Slope crude oil (ANS), however, the flow reversed and region became a net shipper of crude oil and petroleum products to other states.

The impact of this surplus on the pricing of California and Alaska crude oil is best illustrated using posted prices from California. The pricing of Alaska crude oil is complex, since each producer has a different methodology and only average prices are publicly available. However, there is good reason to believe that ANS sold on the West Coast fetches prices of up to \$5 less than the same crude oil sold in the Gulf Coast. California crude-oil prices are also about \$5 less than their counterparts in Texas and Louisiana.

Thousands of
Barrels per Day

Figure 1
The West Coast Oil Surplus

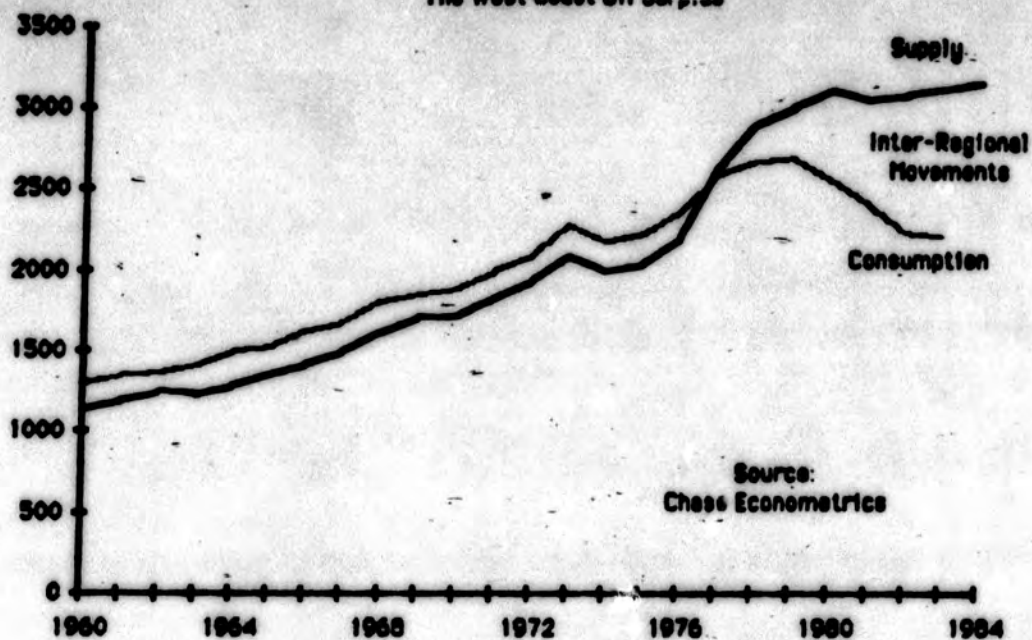
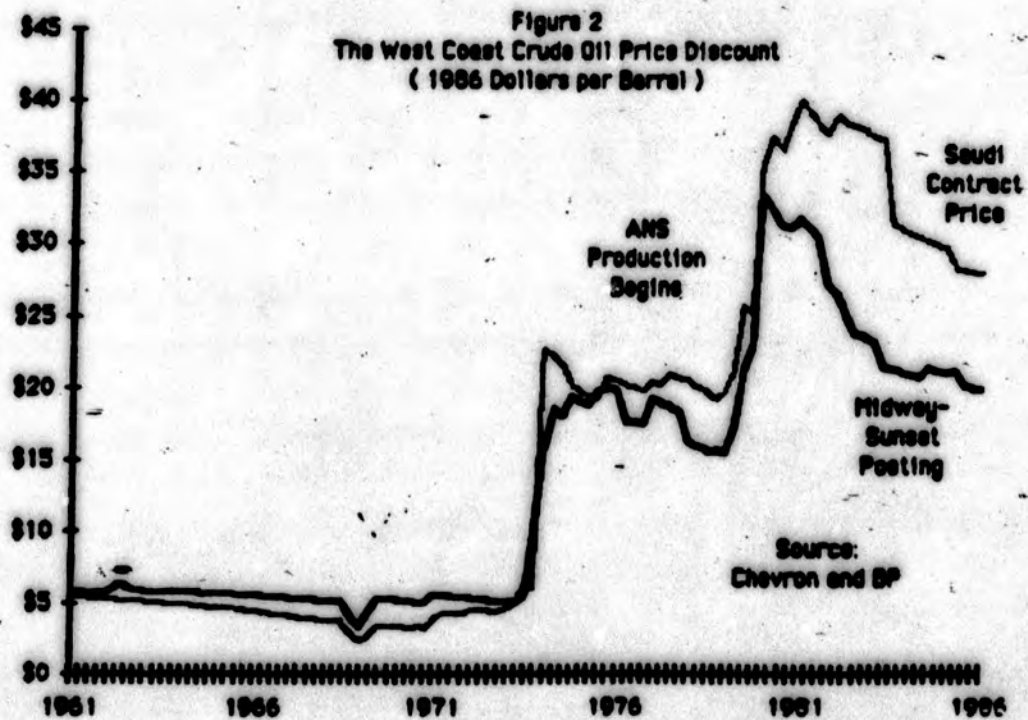


Figure 2
The West Coast Crude Oil Price Discount
(1986 Dollars per Barrel)



The West Coast "discount" is illustrated in Figure 2, where a heavy crude oil from the Midway-Sunset field in California's San Joaquin valley is compared to the official price of Arab Light. Three distinct periods are evident in the chart. From 1961 to 1972, the Mandatory Oil Import Program (MOIP) stabilized domestic prices above the world level. During the period from 1972 to 1976 price controls were in effect for domestic crude-oil production. The prices illustrated here are for the small volumes of uncontrolled production, however, and their movements closely track those of Arab Light. After 1976, however, the prices diverge: Uncontrolled California crude-oil prices are severely depressed. This shift reflects a combination of two influences --- the impact of surplus ANS and the weak market for heavy crude oil that prevailed during much of that period.

The Impact of \$10 to \$15 Crude Oil

The recent drop in crude-oil prices is going to have its most significant volumetric impact in the U.S. West Coast market. The Federal ban on exports requires Alaska and California producers to sell into the depressed West Coast market or ship their crude to the Gulf or East Coast of the U.S., using high-cost domestic tankers.

When world market levels were on the \$30 per barrel, West Coast producers and governments (qua landowners and tax-collectors) were willing to tolerate depressed prices and high transport costs, relative to other producing regions. But at the new price level, much of California's heavy crude-oil production will be uneconomic, and further investment in Arctic Alaska is unlikely. Unless the regulations are changed, therefore, by 1990 crude oil production in Alaska and California is likely to be on the order of one million barrels per day less than they otherwise would have been.

Shrinking production will have an impact on Congress in a way that no lobby, including the ones funded by the U.S. Merchant Marine, can offset. The concern flows from the rapid decline that is in prospect for established Alaska and California production absent new investment; the TEOR projects in the San Joaquin basin, offshore production at Santa Maria crudes, and further development of several giant fields

on the North Slope of Alaska; depend on the maintenance of netback prices substantially exceeding three or four dollars per barrel.

Heavy crude-oil production, particularly from mature fields, is expensive. It requires fuel to generate steam and electricity to pump crude oil, as well as a constant infusion of cash for cleaning and mechanical maintenance. If light crude oil settles between \$10 to \$15 per barrel in Texas, prices for heavy California crudes might range between \$2 and \$7, as long as the West Coast crude market remains in surplus. These prices are well below the average costs incurred by most California TEOR producers. Wells will be shut in rather than maintained, and crude oil production will decline. California production is likely to decline about 10 percent per year, dropping one-half million barrel per day within five years.

The Santa Maria basin offshore California contains the largest U.S. oil find of the past decade. Industry anticipated that this and other California offshore fields could produce up to one-half million barrels per day by the end of this decade. The crude, however, is "heavy" and "sour" --- low gravity and high sulfur --- and hence of low refining value. It is also very expensive to develop. As long as there is a West Coast price discount and world oil prices are less than \$15 per barrel, the planned development is unlikely to proceed.

Crude oil from Alaska's North Slope is even more disadvantaged than California production. The TAPS tariff for shipment across Alaska is now about \$6 per barrel. Then, the crude must be shipped from Valdez at a charge of \$1 to \$2 per barrel to the West Coast or Japan and \$5 or more to the U.S. Gulf Coast. Since export to East Asia is prohibited and the West Coast market is depressed, a North Slope investor (other than one already holding unutilized capacity on TAPS) faces a transport outlay of at least \$11 to move his crude to a viable market. As long as world oil prices fluctuate between \$10 and \$15, therefore, no company will take the risk of such an investment.

Abundant resources of crude oil have been identified on the North Slope, which can be developed for less than \$10 per barrel, net of transport costs, but at current prices such development is uneconomic. The Prudhoe Bay field will begin to decline in 1987, and by the early 1990s

there will be considerable space on the TAPS pipeline. Enhancement of crude-oil from Prudhoe Bay, stepout and infill development of Kuparuk and Milne Point, the opening of production in the Lisburne and Endicott formations, discoveries at Point Thomson and Seal Island, and the prodigious heavy cretaceous deposits at West Sak and Ugnu, are likely to be developed, only if their product can be moved to market at a cost substantially lower than refinery value. This result is unattainable without a relaxation of the export ban, and perhaps further reductions in TAPS transport tolls.

Without a shift in U.S. regulations, further development of Alaska's North Slope must await substantial increases in real oil prices that are not now in prospect. After 1987, production will begin to decline, dropping almost one-half million barrels per day by the mid-1990s.

Implications of Declining West Coast Supplies

Almost one-half of U.S. oil reserves are located in California and Alaska. Compared to production elsewhere, however, West Coast reserves are expensive to produce or transport and expensive to develop. When wellhead prices were more than \$20 per barrel, inefficient federal regulations hardly mattered: a \$5-per-barrel discount would be unlikely to prevent investment. Now, however, \$5 makes a great deal of difference and it is likely that the federal policy will change.

The Reagan administration's avowed policy is to reduce trade barriers and, particularly, to shrink regulation in the energy industries; there has already been considerable progress in this direction. In 1983, the Department of Commerce revised its regulations to allow the export of petroleum products. Since then there has been lively trade in heavy fuel oil from the West Coast to East-Asian markets. In late 1985, federal regulations were again revised concerning the export of Cook Inlet crude oil from Alaska, and a dribble of such exports began in January, 1986.

President Reagan can permit ANS exports by regulation, but either house of Congress can block such a move. The expiration of the Export Administration Act might have eased Congressional restrictions, but it was renewed in 1985. Thus, the export of ANS has a substantial hurdle to overcome.

When Alaska oil was selling at delivered prices of \$34 per barrel, as it was in 1981, or even at its mid-1985 price of nearly of \$27, it was impossible to arouse much public or Congressional concern over a transfer which, after all, affected some of the "deepest pockets" in the nation. Even after deducting the inflated transportation costs of (say) \$11 per barrel, the amounts left to be divided among the beneficiaries --- principally the North Slope producers, the State of Alaska, and the federal treasury --- were stupendous. So long as oil prices remained near all-time highs, therefore, it is hardly conceivable that economic-efficiency arguments for freer trade would make much way against the combination of xenophobia, spite, and generous campaign contributions by U.S. shipbuilders, shipowners, and maritime unions.

Congress will, however, respond to the concerns of Western states and the petroleum industry when oil production begins to decline. It will be forced to respond for the simple reason that the decline has a substantial impact on federal revenue. While a variety of measures, such as crude-oil tariffs and gasoline taxes, are under consideration the least complicated way to enhance federal revenues from the energy industries is to liberalize trade. Every other measure has a major impact on consumers and creates a host of technical problems.

The Impact on Pacific Basin Trade

Canada now has a crude-oil surplus and a nearly empty crude oil pipeline from Edmonton to Puget Sound. Exports were choked off in the mid-1970s because Ottawa feared long-term shortages in the Eastern provinces if Canada's Western reserves were not dedicated solely to domestic use. Alberta crude oil flowing to the state of Washington was replaced by ANS and OPEC crudes. Despite the fact that restrictions on export have been eased, Alberta crude cannot compete with Alaska oil because of the West Coast discount. On the other hand, if ANS is exported, its price to Puget Sound refineries will rise, Alberta crude will become competitive and Canadian crude-oil exports will increase.

Similar adjustments are likely in the California refinery sector. The drop in crude oil prices has made heavy fuel oil once again competitive with gas as electric-utility and industrial fuel. California, how-

ever, prohibits the burning of high-sulfur fuel oil, and there is almost no California or Alaska crude that yields a low-sulfur residuum. The best source of such feedstocks in the Pacific Basin is thus Indonesia.

If the West Coast price discount is eliminated, Indonesian and other low-sulfur imports (including Alberta crudes) will be competitive and can be used in California refineries. This development, in turn, will provide real competition to natural gas at the burner tip, and help rationalize all energy markets in the region.

Conclusion.

The ban on the export of Alaska crude oil is the most crucial impediment to Pacific Basin petroleum trade. It creates an inefficient pricing structure on the West Coast of North America, which distorts prices in surrounding petroleum markets. This prohibition remained in place for more than a decade because high oil prices obscured the inefficiencies it created. Over the coming year, however, the distortions and waste entailed by this policy will become more apparent, and as they come to light, the policy is likely to change.

Once the inhibition on exports of Alaska crude oil is removed, there will be a cascade of reactions that will substantially increase crude-oil and petroleum-product trade throughout the Pacific Basin.

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Shipping - stores and seal

1900-1901

1900-1901

A Special Report to
The President and
The Congress

Shipping, Shipyards and Sealift:

Issues of National Security
and Federal Support 1985

National
Advisory
Committee on
Oceans and
Atmosphere

July 1985



**NATIONAL ADVISORY COMMITTEE
ON
OCEANS AND ATMOSPHERE**
3300 Whitehaven Street, N.W.
Washington, D.C. 20235

SEP 08 1986

To the President and the Members of the Congress:

As Chairman of the National Advisory Committee on Oceans and Atmosphere (NACOA), I am pleased to forward to you a copy of our report, "Shipping, Shipyards and Sealift: Issues of National Security and Federal Support." The conclusions reached and the recommendations made support current trends unlinking shipping from shipbuilding and advance several approaches for strengthening our Nation's sealift capability in the interests of national security.

Respectfully,

John E. Flipse
Chairman

TABLE OF CONTENTS

EXECUTIVE SUMMARY	Page vii
INTRODUCTION	1
Understanding the Scenario	3
Defining the Problem	4
CHAPTER 1.	
Industry Review: Status and Problems in Shipping and Shipbuilding	7
Worldwide Overcapacity—Shipping and Shipbuilding	9
Federal Support Programs for U.S. Maritime Industries.....	10
U.S. Shipping	12
Domestic Trade	12
Foreign Trade	13
U.S. Shipbuilding	15
The Major Yards.....	18
The Minor Yards.....	18
The Orderbook.....	19
Commercial construction	19
Military construction	19
Ship Repair—Commercial and Military	20
Commercial repair work	20
Naval ship overhaul and repair work	21
Employment	21
An Historical Perspective.....	21
The Policy Debate	22
CHAPTER 2.	
Sealift: The Defense Need for Merchant Ships	25
Sealift Requirements	27
The "Congressionally Mandated Mobility Study"	27
The "DOD Sealift Study"	27
The "DOD Sealift Tanker Study"	28
The "Economic Security Shipping Study"	28
Summary	29
Sealift Assets	29
Sources of Sealift Vessels	29
Availability of the Effective U.S.-Control Vessels	30
Availability of Crews	31
The Militarily Useful Vessel	32
Sealift Improvements	35
Cost Comparisons	36
Summary	38
CHAPTER 3.	
Shipyard Mobilization Base: The Defense Need for Shipyards	39
Mobilization Needs, Past and Present	41

The Defense Studies—SYMBA and NADES	42
The "Shipyard Mobilization Base (SYMBA) Study"	42
The "National Defense Shipyard (NADES) Study"	43
NACOA Review of Shipyard Surge Capacity	44
Shipyard Mobilization Base Requirements	46
CHAPTER 4.	
Discussion of Proposed Solutions	51
Approach 1: Increased Support for U.S. Shipyards	53
A. Federally Funded Shipbuilding Program	53
B. Renewal of Ship Construction Subsidy	53
C. Improving Capital Formation - The Maritime Redevelopment Bank.....	54
D. Cargo Preference - Increasing Shipbuilding Demand	54
E. Other Federal Supports	56
Approach 2: Increased Government-Controlled Sealift Assets	56
A. Increasing Government-Controlled Active and Specialized Sealift Fleets	56
B. Increasing Government-Owned Reserve Sealift Fleets	57
Approach 3: Improved and Increased Private Sealift Assets	58
A. Improving the Military Usefulness of Private Vessels	58
B. Terminating "Build-U.S." Requirements	59
C. Encouraging Foreign Investment in U.S. Foreign-Trade Shipping Companies	59
D. Allowing Other Ship Operator Supports	59
E. Encouraging "Reflagging" of Foreign-Registered Vessels to the U.S. Flag	60
F. Allowing Limited Foreign Building for the Jones Act Trade	62
NACOA Positions	63
CHAPTER 5.	
Summary, Conclusions and Recommendations	65
Summary	67
Conclusions	69
Recommendations	71
REFERENCES	77
APPENDICES	83
1. NACOA Panel on Shipbuilding	85
2. Meeting Dates and Speakers	86
3. Organizations Consulted	89
4. Summary of Administration's Maritime Policy: 1982-1984	91
5. Availability of Effective U.S.-Control Vessels	93
6. Selected Legislation of the 98th and 99th Congresses on Maritime Issues	96
7. Glossary of Acronyms	119

EXECUTIVE SUMMARY

Defining the Problem

The Nation's maritime policy, embodied in the Merchant Marine Acts of 1920 and 1936, as amended, has for over half a century provided Federal supports to the maritime industries to preserve in peacetime sufficient capacity to respond to a national defense emergency. It is increasingly clear that our maritime policy, and the package of protections derived from it—tax credits, loan guarantees, ship construction and operating subsidies, limited cargo preference, protected domestic trade (cabotage) and build-U.S. requirements—have had limited success in preserving a viable U.S.-flag fleet and merchant marine. The decline in the shipping and shipbuilding industries despite substantial government supports suggests the need to examine and define the national security requirements for each.

The United States has for some time been the world's largest trading nation with a dramatic increase from 130 million long tons of foreign trade in 1950 to 630 million in 1983. Carriage of foreign trade in U.S.-flag vessels has fallen from over half (by weight) at the end of World War II to less than 6 percent in 1983, but the declining role of U.S. shipping has not impeded the overall growth of the U.S. economy or our foreign trade. Indeed it can be argued that the decline of the high-cost, U.S.-flag fleet, and its supporting shipbuilding base, has had a net beneficial effect on the overall national economy. The economic arguments for Federal support of the maritime industries are thus less than conclusive, and the arguments have focussed increasingly on the national defense needs for U.S. shipping and shipyards.

The primary national requirements for the U.S. maritime industries are the national defense needs, during a conflict, for naval combatant ships to wage war at sea; adequate merchant sealift capacity to project military equipment and supplies overseas and concurrently provide critical shipping to support our economy; and sufficient shipyard capacity to support both. Sealift needs fall into three categories: floating prepositioned storage of supplies; rapid initial overseas deployment of forces, their equipment and supplies (large sealift); and long-term resupply of overseas forces (sustaining sealift). In addition, shipping assets would be needed for import of critical materials and some ordinary trade and for domestic waterborne

transport of critical materials, such as transport of strategic petroleum reserve oil to refineries.

Many experts are concerned that, in time of conflict, the Nation will need many more ships for combat and sealift—and more shipyards to activate, repair and replace them—than present natural economic forces will maintain in peacetime. NACOA has therefore defined the issues, for the purposes of this study on shipbuilding and sealift in the national defense context, as follows:

- What is the most effective and least costly way to ensure that adequate sealift capacity will be available in the timeframe required for a major modern conflict?
- What level of shipbuilding capacity would ensure an adequate base for mobilization and new ship construction and repair in a major conflict?
- To the extent that shipping and shipbuilding capacity is required, what level and type of Federal support are needed or appropriate?

The Scenario

Until recently, national sealift requirements were based on the scenario of a NATO/Warsaw Pact conflict requiring movement of U.S. troops and supplies across the North Atlantic to Europe. The changing balance of world economic and political forces resulting from the late 1960s discovery of massive oil reserves in the Middle East prompted U.S. military planners to begin focussing more attention on the Indian Ocean and the Southwest Asia region (the Middle East and Persian Gulf area). The current defense planning scenario, established by the Joint Chiefs of Staff, assumes that a major global conflict could begin in Southwest Asia, and spread to Europe, Northeast Asia (especially Korea) and three oceans. It is a worst-case scenario in terms of the requirements it generates—a prolonged (3-year), non-nuclear, global conflict, waged in three theatres, with two major periods of sea battle.

Military strategists conclude that a modern global conflict would have to be fought with Naval and sealift vessels already built during peacetime; NACOA concurs with this conclusion. Unlike the beginnings of World War II, where the United Kingdom held off the aggressor for several years while the United States prepared for war, a modern global conflict would almost

certainly mean immediate U.S. involvement, and the increased distance required for sealift of supplies adds severe time constraints. These considerations have prompted serious reappraisal of the status of, and requirements for, the Nation's sealift assets.

Maritime Industry Status

The continued decline in both the shipping and shipbuilding industries in this country has raised increasing national defense concerns.

Although the United States has one of the largest shipbuilding industries in the world, devoted almost solely to naval programs at this time, it ranks only 10th among commercial shipbuilding nations worldwide with less than two percent of the world's commercial ship orderbook. Largely because of differences in national standards of living, the world shipbuilding market, as with other heavy industry, is moving generally from the United States and Europe to the Orient, and from developed to developing nations. The U.S. shipbuilding industry has long been unable to compete with foreign yards. Virtually all of the merchant vessels built in U.S. yards in the past decade have been built either with Federal subsidy or for protected domestic trades, but recent changes in Federal maritime support programs and depressed economic conditions have all but halted this commercial ship construction. Three major shipyards have closed since 1982, and General Dynamics Corporation recently announced that its Quincy Shipbuilding Division, a major shipyard that has been in business for 101 years, will close in the spring or summer of 1986.

There are currently only 6 major U.S. shipping lines, carrying container cargo, down from 19 in 1970, and they are heavily dependent on government cargo reserved for U.S. ships. Almost all U.S.-flag bulk vessels operate in the domestic trades that are reserved for U.S. ships. In the domestic trades, however, trucks, railroads, pipelines, and tug/barges are replacing oceangoing, self-propelled cargo vessels. These developments threaten the viability of the domestic fleet, an important source of militarily useful tonnage and trained U.S. crews for meeting sealift demands in a national emergency.

There are currently less than 500 oceangoing vessels greater than 1,000 gross tons in the U.S.-flag fleet, and 105 U.S. shipyards capable of building or repairing vessels of this size. Except for the tremendous World War II peak, the U.S. shipyard employment base has risen fairly steadily over six decades despite the continued decline in the U.S.-flag fleet. Our longstanding national maritime policy appears to have done a better job of preserving our shipyard base than our U.S.-flag fleet.

Defense Requirements for Ships

The primary national defense requirement for the U.S. shipping and shipbuilding industries, beyond the peacetime carriage of government cargoes and peacetime building and repair of military vessels, is to provide increased sealift and Naval combatant capacity in case of national emergency. Sealift requirements would be similar for a global conflict and for a major U.S. action in Southwest Asia, because lift requirements for other areas would be provided by our allies. Sealift and shipyard requirements to support a major deployment to Southwest Asia have thus received great attention in recent years.

Since 1981, the Department of Defense has completed a comprehensive series of studies quantifying requirements for: prepositioning of supplies, airlift and sealift, delivery of liquid products, shipping needs at home during a global conflict, shipyard capacity for early mobilization (e.g., activating reserve ships) and shipyard capacity for wartime shipbuilding. These studies are all classified either "Secret" or "For Official Use Only;" NACOA has reviewed the entire series.

The 1981 "Congressionally Mandated Mobility Study" (CMMS) concludes that the United States requires an additional airlift capacity of about 20 million ton-miles per day, and recommends that this be supplemented by additional prepositioned supplies and more and faster sealift. The "DOD Sealift Study," completed in March 1984, concludes that the sealift capacity necessary to meet dry-bulk lift requirements for Southwest Asia is about 4.6 million deadweight tons of shipping capacity during the initial surge and about 3.3 million deadweight tons for sustaining resupply. Every militarily useful U.S.-flag private cargo vessel would be needed for sealift in a major overseas deployment, and projections of the future size of the fleet indicate a growing shortfall in U.S.-flag, dry-bulk sealift tonnage. Most of the U.S.-owned vessels under foreign flag are not now considered militarily useful. A companion study, called the "DOD Sealift Tanker Study," now nearing completion, will document a shortfall in militarily useful wet-bulk tonnage for sealift under U.S. ownership (U.S. and foreign flag).

The "Economic Security Shipping Study," recently completed by the Maritime Administration, addresses the shipping requirements for import and domestic transport of critical materials during wartime. The study concludes that there is no shortfall in container or breakbulk ship capacity, because most scheduled general cargo is nonessential in wartime. No shortfall in dry-bulk capacity is expected, since most critical bulk materials are required in small enough quantities to be taken from strategic stockpiles or imported by air. A shortfall is projected, however, in tanker capacity for domestic carriage of refined petroleum prod-

ucts, because the U.S.-flag tanker fleet would be required to support U.S. forces overseas.

Responding to the rapid decline of the U.S.-flag fleet, and increased readiness requirements imposed by the long-distance sealift routes in the new scenario, the Navy is rapidly improving the Nation's sealift capacity. More than \$1 billion a year for 5 years is planned for strategic sealift expenditures, more each year than was spent during all the years since World War II combined. The shortfall in dry cargo sealift is being addressed by increases in government-owned sealift vessels and increased funding for modifying commercial cargo vessels. The shortfall in wet-bulk sealift will probably be addressed by purchase of tankers for the Ready Reserve Force and further examination of alternatives such as foreign petroleum supply. The only projected shortfall in domestic shipping needs during a conflict is in tanker capacity for domestic petroleum carriage, but this could be alleviated by allowing foreign tank vessels (owned by U.S. citizens) to enter the protected Jones Act trade during a conflict. The cumulative effect of these approaches is greatly enhanced sealift capacity that is substantially more "ready."

Defense Requirements for Shipyards

The U.S. shipbuilding base must have sufficient "surge capacity" during early mobilization to activate the reserve combatant and sealift vessels and to convert active merchant vessels for sealift, and must expend quickly for battle damage repair of merchant and combatant ships and for new construction to replace vessels lost during a prolonged conflict.

Two joint studies by the Department of Defense and the Maritime Administration examine the shipyard capacity requirements. The "Shipyard Mobilization Base Study" (SYMBA) reviews the adequacy of the October 1982 shipbuilding base for a 3-year global conflict. The "National Defense Shipyard Study" (NADES) examines the adequacy, for the early mobilization stage of a conflict, of a much smaller shipyard base that is expected to survive the current decline and remain available in 1988-1990. The SYMBA Study concludes that an absolute minimum of facilities needed for the first year of conflict is 51 building positions, 41 graving docks and 56 floating drydocks; that shipyard facilities existing in October 1982 were more than adequate for a major mobilization; and that there might be temporary shortfalls in the number of skilled shipyard workers during early mobilization and later during wartime ship construction. The NADES Study uses different, and NACOA believes more realistic, assumptions about early mobilization and reflects the increased sealift readiness now planned by the Department of Defense. The NADES Study found that early mobilization would require initial availability of 142,000 skilled shipyard workers, peaking to 157,000

in the eighth month. The Department of the Navy concludes that peacetime employment, even in the smaller shipyard base projected for 1990, would be roughly adequate for early mobilization and facilities would be more than adequate for mobilization tasks.

An independent NACOA survey of shipyard surge capacity in the major defense contract yards suggests they are currently operating at only about half their full peacetime capacity in workers and steel fabrication, and only about a third of their capacity to finish new vessels. Our estimate of their wartime maximum capacity suggests a possible increase in ship production of 4 to 6 times greater than in today's underutilized shipbuilding base, without expansion of facilities.

Surge requirements for U.S. shipyards for a major mobilization have been lowered through several government initiatives: by increasing the amount of prepositioned military supplies, thus reducing the number of sealift ships needed; by building and converting a number of vessels under government control for sealift; by increasing the readiness of our reserve fleets, and thus reducing the shipyard work needed for activation; by relying more on conversion of existing commercial vessels than on wartime newbuilding of sealift vessels; and by planning more pre-mobilization work on commercial vessels in the active U.S.-flag fleet. NACOA concurs with the Department of Defense that a substantially reduced private U.S. shipbuilding base would be adequate to meet early mobilization needs required by the present scenario.

Alternatives

The range of solutions offered by public and private interests for solving the Nation's sealift problems fall into three broad categories:

- Preserving excess shipbuilding capacity through increased support for U.S. shipyards in peacetime, so that warships and sealift vessels can be activated, repaired and built during a major conflict.
- Increasing the government-controlled merchant fleet to have immediate and direct control of needed sealift assets during a major mobilization.
- Increasing the number and military readiness of privately owned sealift assets through measures to aid U.S. ship operators.

Our positions on several major proposals are as follows. We oppose a Federal shipbuilding program for new merchant vessels to be chartered or laid up in reserve fleets. We oppose a cargo preference scheme that would reserve a percentage of commercial cargos in U.S. foreign trade to U.S.-flag, U.S.-built vessels. We oppose a federally supported "Maritime Redevelopment Bank," that would use Federal funds to encourage financing for ship construction. We oppose any increased Federal supports to the U.S. shipbuilding industry, because the industry has overcapacity for the commercial market it serves, and the present

shipyard base is substantially in excess of the capacity needed for defense mobilization. We support more concerted efforts to increase the military usefulness of private merchant vessels and to increase the shipping tonnage in the active commercial U.S.-flag fleet. We favor increased use of private vessels as sealift assets rather than preserving excess shipbuilding capacity or increasing government control of sealift assets.

For the most part, NACOA opposes the range of proposals initiated largely in the Congress to preserve excess shipbuilding capacity; opposes further growth in the government-controlled active and reserve sealift fleets without fully exploring other alternatives; and supports a range of proposals from various sources, including our own deliberations, to increase the number and military usefulness of private vessels under U.S. control.

Conclusions and Recommendations

NACOA concludes the following:

- Sealift requirements for the initial stages of a modern major conflict depend more on the sufficiency of existing U.S.-controlled shipping and trained U.S. crews than on shipbuilding capacity. National efforts should therefore emphasize developing a viable Federal and commercial sealift fleet in peacetime.
- The United States now has a very large shipbuilding capacity, and the yards expected to survive the current decline will still have sufficient surge capacity to satisfy wartime needs as defined by current defense scenarios.
- Requirements to build in U.S. shipyards have impaired the competitiveness of U.S. operators of oceangoing, self-propelled cargo vessels, have contributed to the decline in the U.S.-flag fleet, and have failed in recent years to create substantial commercial work in U.S. shipyards.
- Most recent proposals to aid the U.S. shipbuilding industry—such as a federally funded merchant shipbuilding program, renewed construction subsidies, a federally backed maritime bank, and expanded cargo preference—are too small in scope to be of significant impact or would create larger problems.

NACOA recommends the following:

1. **OPPOSITION TO PROPOSALS FOR A FEDERAL SHIPBUILDING PROGRAM FOR COMMERCIAL SEALIFT VESSELS—OR ANY OTHER PROGRAM REQUIRING MAJOR FEDERAL FUNDING—DESIGNED TO PRESERVE THE PRESENT EXCESS CAPACITY IN THE SHIPBUILDING BASE.**

NACOA believes that all additional surge capacity required for mobilization currently exists within the yards doing Navy peacetime construction, and Navy and commercial repair work, and that this work will preserve an "irreducible minimum" shipbuilding base that will be adequate in future mobilization. This smaller shipbuilding base might initially be inadequate for wartime construction, but shipyard expansion would begin immediately and would continue as needed throughout the conflict. The Department of Defense studies allow virtually no geographic movement of skilled shipyard workers during mobilization, and we believe this is an unrealistic constraint. The major constraint on expansion of wartime shipbuilding would not be shipyard capacity, but delayed availability of major components, e.g., propulsion plants for Navy and merchant vessels, and complex weapons systems for combatant vessels; increases or decreases in the shipbuilding base would not affect this problem.

2. **DECREASED DEPENDENCE ON A GOVERNMENT-OWNED AND MAINTAINED READY RESERVE FORCE, AND REDUCED SIZE AND INCREASED READINESS OF THE RESERVE SEALIFT FLEETS.**

NACOA supports the approach of adapting modern, active commercial vessels to military purposes, because maintenance costs are borne by the operator in trade, the vessel provides training for U.S. crew, and the ship would have a ready crew if it were called up for service. In the long run, we believe this is a more efficient and less costly alternative than Federal building, acquiring or serving of an outmoded reserve fleet.

3. **CONTINUED EMPHASIS ON METHODS OF ADAPTING COMMERCIAL EFFICIENT VESSELS FOR MILITARY PURPOSES.**

Continued research is needed to develop cost-effective ways of adapting modern commercial vessels to military sealift needs. In addition, funding should be provided to do such conversion and activation work on U.S.-flag commercial ships during peacetime to enhance their readiness, reduce the shipyard conversion time required at mobilization, decrease the shipyard base required and decrease the need for expanded government-controlled sealift fleets.

4. **INCREASED EMPHASIS ON ENSURING THE AVAILABILITY, TRAINING AND READINESS OF U.S. CREWS NEEDED FOR MOBILIZATION OF RESERVE AND FOREIGN-FLAG SEALIFT VESSELS.**

Requirements for increased numbers of ready crews are being generated by the expanding size of the Ready Reserve Force, and increased reliance on U.S.-owned, foreign-flagged vessels. In addition, the greater readiness requirements for sealift vessels require better training and more rapid availability of crews to staff them.

**6. CONTINUED UNLINKING OF NATIONAL SHIP-
PING AND SHIPBUILDING POLICIES BY ELI-
MINATING ALL REQUIREMENTS FOR U.S.-
FLAG OPERATORS RECEIVING GOVERNMENT
SUPPORTS TO BUILD VESSELS IN U.S. SHIP-
YARDS.**

Specifically, we recommend that operators be allowed to use foreign-built vessels in the U.S. foreign trades and still be eligible for Capital Construction Fund tax credits, Title XI Federal Ship Loan Guarantees, immediate access to government-impelled cargoes and operating subsidy, preferably a new form of operating incentives we propose. (See recommendation #6.)

We believe the half century of requirements to build new vessels in high-cost U.S. shipyards has increased the capital and operating costs of the U.S. shipping industry, has discouraged modernization and expansion of the U.S.-flag fleet; and has contributed to the long-term decline of domestic and foreign waterborne trading opportunities for the U.S. fleet. We support permanent authority for U.S. shipowners to operate foreign-built vessels in the foreign trades while receiving Federal supports, to improve the competitive position, and thus the size and sealift capacity, of the U.S.-flag fleet.

**7. AMENDMENT OF CURRENT MARITIME STAT-
UTES THAT IMPAIR THE COMPETITIVENESS
OF U.S. VESSELS IN FOREIGN TRADE.**

Specifically, we recommend establishment of a new form of operating incentives linked to reductions in crew size and related operating costs; amendment of shipboard manning laws and regulations that prevent reductions in U.S. vessel crew size; and exemption of oceangoing cargo ships from paying duty on foreign

shipyard repairs. Federal supports must be designed to encourage decreases in U.S. operating costs. Crew size and other operating costs must be reduced if the U.S. fleet is to become competitive in the world market and grow to provide increased sealift assets under private control.

**7. INCREASED EMPHASIS ON INCENTIVES TO
ATTRACT FOREIGN-REGISTERED VESSELS—
UNDER U.S. OR FOREIGN OWNERSHIP—TO
THE U.S. FLAG.**

We propose a number of measures to encourage reflagging to the U.S. registry of vessels now under foreign registry. Even a small-scale reflagging would be desirable from a national defense standpoint, because these ships would provide work and training for U.S. crews, would be available for pre-mobilization installation of Sealift Enhancement Features, and would thus increase the sealift readiness of the U.S.-flag fleet.

**8. AMENDMENT OF THE JONES ACT TO ALLOW
SOME FOREIGN BUILDING OF NEW COMMER-
CIAL CARGO SHIPS FOR THE JONES ACT
DOMESTIC TRADE.**

We recommend a 10-year "coproduction" period, requiring building in U.S. shipyards in order to earn transferable credits for building in foreign yards. We suggest that these provisions be applicable only to large, oceangoing self-propelled, cargo-carrying ships that are capable of contributing to the Nation's sealift needs in case of a national emergency. This approach might stimulate a limited increase in commercial shipbuilding orders in U.S. yards, without Federal funding, and would expand and modernize the U.S.-flag, sealift capable cargo fleet.

Introduction

Understanding the Scenario	3
Defining the Problem	4

INTRODUCTION

In its January 1983 report, "Marine Transportation in the United States: Constraints and Opportunities," the National Advisory Committee on Oceans and Atmosphere (NACOA) presented a number of findings and recommendations concerning the U.S. shipbuilding industry. NACOA found that:

Congress and the Administration have continuously stressed that a U.S.-flag marine transportation system, with its supporting industrial base, is essential to our Nation's national security in peace and in times of emergency. Given this policy, NACOA concludes that the present levels of U.S.-flag participation in our trade and the supporting shipbuilding base are critically below that required to meet U.S. needs.

The Committee recommended prompt aid to U.S. shipyards and suggested government-backed low financing to attract foreign orders to U.S. yards, tax incentives for the yards to invest in productivity improvements, and government-assisted worker training programs. The report recommended that tax advantages for U.S. ship operators should continue to apply only for U.S.-built vessels and should not be expanded to encourage U.S. owners to build new vessels in foreign shipyards.

Of the many areas addressed in the 1983 NACOA report, the U.S. shipbuilding base appeared to have the most critical and immediate problems. A number of shipyards were reported to be facing imminent closure, and NACOA believed the situation was serious enough to warrant a follow-on study focussing on the problems of the shipbuilding industry and the possible national security implications. This study was begun in May of 1983.

For half a century, since passage of the Merchant Marine Act of 1936, the major justification for Federal supports for the shipping and shipbuilding industries has been their national defense utility. Consequently, we have reviewed the present Department of Defense (DOD) conflict scenario, mobilization plans, sealift needs and wartime economic shipping needs, available and projected sealift assets, ship activation requirements, wartime ship construction and repair needs, the consequent shipyard mobilization base required, and projections of decline in the shipyard base. The major classified documents on these subjects were made available to NACOA for review, and the Committee

held three classified sessions with officials of the intelligence community, the Department of Defense and the Maritime Administration. We also have considered the substantial recent changes in the Defense Department's assets for and approach to sealift and mobilization. At the same time, we considered numerous proposals designed to improve the Nation's sealift assets or to preserve its shipbuilding base or both. Based upon this expanded review, we have reaffirmed some conclusions from our earlier report on marine transportation, but we also have changed some of our previous recommendations.

Understanding the Scenario

Because of our Nation's geographic location—flanked by oceans on two sides and by the Gulf of Mexico to the south—virtually all of our allies are "overseas." This, coupled with a "forward" defense strategy based on keeping a conflict as far away as possible from our own borders, requires overseas projection of forces and their support by airlift and sealift.

Until recently, national sealift requirements were based on the scenario of a North Atlantic Treaty Organization (NATO)/Warsaw Pact conflict requiring movement of U.S. troops and supplies across the North Atlantic Ocean to Europe. No shortfalls in sealift capacity were foreseen for this scenario for several reasons despite a shrinking U.S.-flag fleet. Many troops and supplies are positioned in Europe. NATO allies have committed 400 merchant vessels to support a U.S. deployment in Europe. U.S.-owned, foreign-flagged vessels are considered to be available, and most (80 percent) carry NATO-nation officers and are largely crewed by foreign nationals from countries that have strong defense relationships with the United States—the Republic of South Korea, the Philippines and Taiwan (Yourch, 1985). Airlift, not sealift, had received primary attention and funding.

During the mid-1960s, the Soviet Union began to change its overall strategy from one of developing and defending its continental territory to one of aggressively extending its economic, political and military presence worldwide (Office of the Chief of Naval Operations, 1985). The discovery of massive oil resources in the Middle East in the late 1960s, and its

consequent effects on the balance of economic and political forces in the region and the world, prompted U.S. military planners to begin focussing more attention on the Indian Ocean and the Southwest Asia region.*

For several years, the U.S. Secretary of Defense, the Joint Chiefs of Staff and the military services have cooperated in studies called Strategic Mobility Requirements and Program (SMRP). The fiscal year 1982 SMRP focussed on the airlift and sealift requirements of a worldwide conflict centered in Europe between NATO and Warsaw Pact nations. SMRP-83 added an analysis of lift requirements for a unilateral U.S. military action in Southwest Asia. The Secretary of Defense directed that SMRP-84 planning be based on the possibility of a worldwide conflict centered in Southwest Asia as well as in the NATO/Warsaw Pact region (Office of the Chief of Naval Operations, 1985).

The Department of Defense quickly realized there would be difficulties responding to a military emergency in Southwest Asia: the distance for projection of forces is great; NATO support would not necessarily be forthcoming for limited U.S. actions; there are few defensible locations for land-based prepositioned supplies; and poor local infrastructure (ports, airstrips, roads) would require sealift of even more equipment for improvements. A Rapid Deployment Force (RDF) was established in 1981 in case of a crisis in this region, and its deployment needs focussed increased attention on the limits of available sealift. For a deployment to Southwest Asia, 95 percent of the supporting equipment and 99 percent of the fuel would go by sea. Yet, as late as fiscal year 1983, 97 percent of the mobility funding went to airlift and only 3 percent to sealift—almost a reverse proportion to the amount of lift each would be required to accomplish in a major mobilization of this kind (Congressional Budget Office, 1984).

What has emerged is a significantly changed approach to defense planning for a major conflict, with a new planning scenario established by the Joint Chiefs of Staff. It is a worst-case scenario in terms of the requirements it generates—a prolonged (3-year), non-nuclear, global conflict, waged in three theatres, with two major periods of sea battle. Continued emphasis is being placed on the requirements for an action in Southwest Asia, because lift requirements in the other two theatres are expected to be largely provided by our allies (U.S. Department of Defense, 1984). Because of this assumption, sealift requirements would be similar for a global conflict and for a unilateral major U.S. involvement in Southwest Asia.

A series of recently completed defense planning studies have addressed requirements for this same scenario; requirements have been quantified for troops, equipment and supplies, airlift, sealift and shipyard capacity. The studies dealing with sealift needs are discussed in Chapter 2 of this report, and those addressing requirements for a shipyard mobilization base—both for early mobilization and for a prolonged conflict—are examined in Chapter 3.

Defining the Problem

Since the founding of our Nation, the United States has, to some degree, protected our shipping and shipbuilding industries from foreign competition. An 1817 cabotage act reserved U.S. coastwise trade to U.S. vessels. Cabotage is generally understood as the trade or transport of merchandise by sea between two ports within the same country; it has also come to mean the practice of restricting such trade to ships registered within that country. Unlike many other maritime nations, the United States requires that vessels in the cabotage trade be not only registered, but built, in this country. The Merchant Marine Act of 1920, commonly known as the "Jones Act," reaffirmed this domestic trade reservation and has since remained basically unchanged. The pre-World War II Roosevelt Administration and the 1936 Merchant Marine Act stressed national defense arguments for protecting our maritime industries. During the five decades since, our national maritime policy has continued to support a strong U.S. fleet—U.S.-owned, built, manned and repaired. These requirements for U.S. ownership, construction in U.S. shipyards, and U.S. crews apply not only to vessels in our inland waterways and coastwise "Jones Act" trade but also to operation and construction subsidies established in the 1936 Merchant Marine Act for U.S. vessels in foreign trade, and for almost all subsequent loan guarantees and tax benefits that have been legislated for the maritime industries. Thus, U.S. ship operators and shipyards have long been linked, and the rationale for supporting both has largely been based on national security needs.

U.S. commercial ship construction costs have become two to three times higher than those reported in foreign yards and delivery times considerably longer. Questions have been raised in recent years about whether the many requirements to build in U.S. shipyards may not be imposing an unnecessary or unfair burden on the already ailing U.S. shipping industry by requiring U.S. shipowners, in effect, to support U.S. shipyards for the national interest.

The decline of both industries—despite substantial government subsidy, protection, tax advantages and other supports—suggests the need to examine and define the national security requirements for each.

* "Southwest Asia" is a geographic descriptor recently adopted by the Department of Defense to describe the Middle East and Persian Gulf area.

National security in this context is often understood to include two aspects. The first involves the overall economic health of the Nation, including such indicators as volume of foreign trade, trade deficit, gross national product, and the like. The second encompasses the Nation's defense needs; in the case of the maritime industries, these include shipping assets to carry military equipment and supplies overseas and to carry wartime imports of critical materials, and a shipbuilding base to activate and replace the sealift shipping, and to repair and build warships, as needed during a conflict.

In examining the economic impact of the shipbuilding industry, we find that the U.S. private shipbuilding and ship repair industry employs about 170,000, with gross industry revenues annually of about \$11 billion, representing less than 0.2 percent of the Nation's labor force, and in 1982 accounting for about 0.25 percent of the Nation's gross national product.* For comparison, the shipbuilding employment level represents about 70 percent as many workers as the motor vehicles industry and about 15 percent of the revenues of that industry (U.S. Department of Commerce, 1982). The U.S. shipping and shipbuilding industries are both capital and labor intensive, and largely unable to compete with lower foreign wage rates and major government supports provided in other shipbuilding nations. Import and export costs for U.S. business as a whole have been lowered through lower foreign-flag shipping costs. U.S. foreign trade has grown steadily and impressively since World War II, and the United States is now the major trading nation in the world. At the same time, however, there has been a precipitous decline in the percentage of this trade carried in U.S. vessels. Indeed, it can be argued that the decline of the high cost U.S.-flag fleet, and its supporting shipbuilding base, has had a net beneficial

* This employment figure excludes 78,500 workers in the Nation's nine public shipyards owned by the Navy and the Coast Guard; within the private sector it includes all workers employed in shipbuilding-related fields, including unskilled and administrative workers within the shipyards and also including related work such as ship design, consulting, etc. As such it is an economic indicator and not strictly representative of the emergency shipbuilding capacity available for a major conflict.

effect on the overall national economy. The economic arguments for Federal support of the maritime industries are thus less than conclusive, and the arguments have focussed increasingly on the national defense needs for U.S. shipping and shipyards.

The major national defense role for U.S. merchant ships is to provide national sealift capacity. With 40 of our 42 allies (Holloway, 1983) and about one-fourth of our land combat troops overseas (Tarpgaard, 1984), sealift capacity is an essential part of U.S. defense readiness. U.S. merchant vessels would be needed in a major or minor conflict to deliver military equipment and supplies overseas and to ensure the continuing import of critical materials to U.S. ports. These sealift vessels must be "in being," that is, already constructed before mobilization. And the U.S. shipbuilding base must have sufficient "surge capacity" to activate and convert available ships very quickly at the onset of a conflict—both reserve naval ships and reserve and commercial merchant ships for sealift. The shipbuilding base also must be sufficient to expand quickly enough to handle battle damage repair to merchant and combatant ships and to begin new construction to replace vessels lost during a prolonged conflict.

Many experts believe the Nation will need, in time of conflict, more ships for sealift and more shipyards to activate, repair and replace them than present natural economic forces will maintain in peacetime. Consequent proposals for Federal supports to the maritime industries abound. Because the national defense argument is so frequently used—but often not defined or quantified by those who use it—NACOA sought to review carefully the national defense needs for sealift and shipyard mobilization base.

NACOA has thus defined the issues, for the purposes of this study on shipbuilding and sealift in the national defense context, as follows:

- What is the most effective and least costly way to ensure that adequate sealift capacity will be available in the timeframe required for a major modern conflict?
- What level of shipbuilding capacity would ensure an adequate base for mobilization and new ship construction and repair in a major conflict?
- To the extent that shipping and shipbuilding capacity is required, what level and type of Federal support are needed or appropriate?

Chapter 5

Summary, Conclusions and Recommendations

Summary	67
Conclusions	69
Recommendations	71

CHAPTER 5

Summary, Conclusions and Recommendations

Summary

The Merchant Marine Act of 1936 clearly states that protecting U.S. shipping interests and preserving U.S. shipyards are national defense requirements. It is increasingly clear, however, that this national policy, and the package of protections derived from it—tax credits, loan guarantees, government-impelled cargo preference, cabotage, and build-U.S. requirements—have had limited success in preserving a viable U.S.-flag fleet and merchant marine. Increased ship size and faster turnaround times in port have preserved the carrying capacity of some parts of the U.S. fleet, particularly the containerships carrying "liner" cargo on scheduled trade routes, but the carriage of dry-bulk commodities in U.S. ships has almost disappeared, and the overall percentage of U.S. foreign trade carried today in U.S.-flag vessels has declined to only 6 percent. Owing to competitive costs from other modes of freight transportation, including oceangoing tug and barge, and especially owing to the cost of vessel replacement in U.S. yards, our domestic Jones Act fleet of ships is aging and shrinking.

Three major shipyards have closed in the past two years (Maryland Shipbuilding, American/Lorain and Savannah). In addition, General Dynamics Corporation has announced it will close its Quincy Shipyard in the spring or summer of 1986, and the Shipbuilders Council of America reports that several more major private shipyards are on the verge of closing. Despite many build-U.S. requirements dictated by law, no commercial oceangoing vessel orders were placed in U.S. shipyards in 1983, only five such ships were ordered in 1984, and no orders have been placed so far in 1985. The shipbuilding industry, at least as far as the major shipyards are concerned, is approaching a "monopsony," a situation where there is only one buyer in the market. The U.S. Navy generated almost 90 percent of the work in the major U.S. private shipyards in 1984. The "system" of laws and Federal programs related to marine transportation is not working. National defense arguments are increasingly used to justify retaining present Federal supports, which the Administration wishes to terminate, or for expanding Federal supports—especially for the U.S. shipbuilding industry.

In peacetime, the national defense need for the maritime shipbuilding industries is carriage of government cargos and building and repair of military vessels. In case of national emergency, the primary national defense requirement for the U.S. shipping and shipbuilding industries is to provide combatant and sealift shipping capacity, and the shipyard capacity to activate, convert, repair or replace the ships. During a conflict or national emergency, sealift ships would be needed for the rapid delivery of military equipment and supplies overseas and for sustained resupply, and additional shipping assets would be needed to carry critical imports to this country and to sustain critical domestic trade. A shipbuilding base would be needed to the extent that naval and merchant vessels would require rapid activation or conversion at the beginning of a conflict, regularly scheduled maintenance, battle damage repair and new construction for replacement of vessels lost during a prolonged conflict. How much sealift capacity is needed depends on how the military chooses to deploy its forces and its equipment. How many sealift ships and how much of a supporting shipyard mobilization base are needed depend a great deal on how the Nation chooses to solve its sealift problems.

Defense mobilization planners are currently working with a conflict scenario developed by the Joint Chiefs of Staff—basically a protracted (3-year), non-nuclear, three-theatre, global conflict that begins in Southwest Asia and spreads to Northeast Asia, Europe and three oceans. A series of Department of Defense studies, completed from 1981 to 1984, examined the cost effectiveness and timeliness of airlift, prepositioning of supplies and sealift for delivery of military equipment and supplies to a distant conflict area, especially to one in Southwest Asia. The studies proposed a coordinated mix of the three approaches and concluded that the United States had shortfalls in all three. A companion study also found a marginally adequate shipyard capacity to support sealift needs. The military's response has been to design programs to remedy the shortfalls in airlift, prepositioning and sealift, and to reduce the amount of ship activation work required to mobilize sealift ships. If these programs are fully funded, DOD projects no shortfall in shipyard capacity for the early stages of mobilization,

even if the number of yards should decrease considerably. Potential shortfalls in shipyard capacity for newbuilding later in a prolonged conflict can be met with wartime expansion of shipyard facilities.

NACOA has reviewed a wide variety of studies and proposals that have been made by representatives of the Administration, the Congress, academia and industry for solving the problems of shipyard and sealift capacity. Because the national defense argument is so consistently used for preserving excess shipyard capacity in peacetime, NACOA found it appropriate first to examine various approaches to solving the sealift problem, including present DOD programs and plans, and then to assess the consequent shipyard capacity needed to support the Nation's sealift needs.

Although there are many variations on each theme, NACOA sees three approaches (Table 24) to enhancing sealift capacity:

1. Provide Federal supports to preserve excess shipbuilding capacity in peacetime time—so that needed warships and military sealift vessels can be activated, repaired and built during a major conflict.

Proposals include:

- (a) A federally funded shipbuilding program, building militarily useful merchant vessels, designed to enhance sealift assets and preserve excess shipyard capacity. New vessels would be sold or chartered to private operators, if possible, or placed in reserve.
- (b) Renewal of Construction Differential Subsidy (CDS) disbursements, with stricter guidelines for controlling U.S. shipyard costs.
- (c) A "Maritime Redevelopment Bank" initially funded from Federal sources, intended to stimulate capital formation for shipbuilding projects and to provide work for U.S. shipyards.
- (d) Cargo preference, to reserve a certain percentage of U.S. foreign bulk cargo trade to U.S.-flag vessels built in U.S. shipyards. The latest cargo preference proposal, in the 99th Congress, would create a demand for about 20 new U.S.-built bulk carrier vessels each year for 15 years.
- (e) Other Federal supports proposed include government purchase of private yards, more Navy vessel repair work for private yards and several tax incentive proposals.

2. Increase the government-controlled merchant fleet—to have immediate and direct control of needed sealift assets during a major mobilization.

The only formal proposal at present involves expanding the government's reserve sealift fleet through increased purchase of existing merchant hulls, both dry cargo and tanker vessels, to be maintained in storage at government expense in high-readiness status.

3. Increase the number and military readiness of privately owned sealift assets in case of a major

mobilization—through increased Federal supports and other measures to aid U.S. ship operators.

Proposals include:

- (a) Increase adaptation of active, commercially efficient vessels to military usefulness, including pre-mobilization modifications to U.S.-flag vessels with commercial operators fully reimbursed for consequent operating losses.
- (b) Terminate the requirements for U.S.-flag ship operators receiving Federal supports to build vessels in U.S. shipyards.
- (c) Increase capital of U.S. shipping companies by allowing greater foreign investment.
- (d) Repeal of the tax on non-emergency ship repairs done in foreign shipyards; amendments to laws and regulations that restrict reductions in crew size in U.S.-flag vessels; and continuation of some form of Operating Differential Subsidy (ODS), with stricter guidelines for controlling crew costs.
- (e) Develop a set of incentives to encourage "re-flagging" of U.S.- and foreign-owned vessels now under foreign registry.
- (f) Allow limited foreign building for the Jones Act domestic trade to stimulate modernization and growth of ships in the U.S.-flag domestic fleet.

These proposals, and NACOA's position on them, are discussed in Chapter 4 of this report. Table 24 summarizes the proposed solutions, with NACOA, Administration and Congressional positions shown for each.

In summary, Congressional initiatives tend to fall into the first general approach—that of increasing Federal aids to U.S. shipyards to preserve excess shipbuilding capacity. Although a variety of such proposals were included in legislation introduced in the 98th Congress, none passed, and most did not get beyond Subcommittee or Committee level. Several bills have been introduced in the 99th Congress that would increase Federal aid to U.S. shipyards; to date, none have been passed by either House.

The Administration opposes virtually all efforts to increase Federal supports to U.S. shipyards, favors a continued buildup of government-owned sealift assets and is mixed in its response to various proposals for increasing and improving privately owned sealift assets.

For the most part, NACOA opposes the range of proposals initiated largely in Congress to preserve excess shipbuilding capacity, and opposes further growth in the government-controlled active and reserve sealift fleets without fully exploring other alternatives. NACOA supports a range of proposals from various sources, including our own deliberations, to increase the number and military usefulness of private vessels under U.S. control—those in the U.S.-flag domestic and foreign trades and those under foreign registry.

Table 24.—Proposed Solutions to Shipyard and Sealift Problems.¹

Proposed Solution	NACOA Position	Administration Position	Congressional Initiative
Approach 1.			
Increased Support for U.S. Shipyards			
A. Federally funded merchant shipbuilding program	Oppose	Oppose	Proposed
B. Renewed ship construction subsidy	Oppose	Oppose	Proposed
C. The Maritime Redevelopment Bank	Oppose	—	Proposed
D. Cargo preference requiring U.S.-built ships	Oppose	Oppose	Proposed
E. Other Federal supports	Oppose	Oppose	—
Approach 2.			
Increased Government-Controlled Sealift			
A. Increase government-controlled active fleet	Oppose	Oppose	—
B. Increase government-controlled reserve fleets	Oppose/Favor	Favor	—
Approach 3.			
Improved and Increased Private Sealift			
A. Improve military readiness of private vessels	Favor	Favor	—
B. Terminate build-U.S. requirements	Favor	Favor	—
C. Encourage foreign investment in U.S. shipping companies	Oppose	Favor	—
D. Allow other ship operator supports	Favor	Oppose/Favor	—
E. Encourage reflagging	Favor	—	—
F. Limited foreign building for Jones Act fleet	Favor	Oppose	—

¹ Proposed solutions are listed according to NACOA discussion in Chapter 4 of this report.

Source: National Advisory Committee on Oceans and Atmosphere. 1985. Washington, D.C.

NACOA supports several Administration positions:

- "Build-foreign" proposals.
- Plans to enhance the readiness of private U.S.-flag vessels through installation of "Sealift Enhancement Features."
- Opposition to commercial cargo preference.

NACOA, however, opposes the Administration's programs and policies of:

- Continued emphasis on expansion of dry cargo- and tanker capacity in the reserve fleet.
- Implementation of the Navy's "seashed/flatrack" containership modification program as currently designed and priced.
- Increased foreign investment in U.S. shipping companies.
- Phase-out of Operating Differential Subsidy, with no replacement program to support ship operators, and elimination of the Capital Construction Fund tax deferral.
- Reaffirmation of the "sanctity" of the Jones Act and continuation of the U.S.-built requirement for vessels in the Jones Act domestic trade.

Rigorous comparison with Congressional positions is difficult, because a unified new approach to shipyard and sealift problems has not yet emerged from the Congress.

Conclusions

NACOA has reached the following conclusions:

1. Under current defense scenarios, sealift requirements for the initial stages of a modern

major conflict depend more on the sufficiency of U.S.-controlled shipping—and on trained U.S. crews—than on shipbuilding capacity. Shipyard facilities can be expanded for new shipbuilding during a prolonged conflict. National efforts should therefore emphasize developing a viable Federal and commercial sealift fleet in peacetime, rather than preserving excess shipyard capacity.

NACOA concurs with military strategists who point out that a modern global conflict would have to be fought with Naval and sealift vessels already built in peacetime. Unlike the beginnings of World War II, where the United Kingdom held off the aggressor for several years while the United States prepared for war, a modern global conflict would almost certainly mean immediate U.S. involvement and much more rapid developments requiring more "ready" response.

In a modern global conflict, or a unilateral U.S. action in Southwest Asia, a large number of dry cargo and tank vessels would be needed very quickly upon mobilization; U.S. reserve vessels and requisitioned foreign-flag vessels would require large numbers of trained and ready U.S. or allied crews. The critical shipyard capacity need is for activation and conversion of combatants and sealift vessels in the early stages of mobilization. Present and projected sealift capacity is deemed by DOD to be adequate for resupply. Wartime shipbuilding capacity is required largely to replace naval and sealift vessels lost in the conflict to the extent that reserve vessels and foreign-flag

assets are not available. There will be time to build up additional shipbuilding capacity if it is needed in a prolonged conflict.

2. Despite several recent major shipyard closures, the United States still has a very large shipbuilding and ship repair capacity, one of the largest in the world. There is sufficient surge capacity within those yards expected to survive economically, without direct government supports to satisfy wartime needs as defined by current defense scenarios. No Federal support of shipyards is necessary beyond the peacetime defense contract work.

The United States has more than 600 ship design, shipbuilding and ship repair facilities; about 90 of these are shipyards with the capability for at least topside repair on a 400-foot vessel, and 29 are considered "major" yards with the capability to build or repair in a dry environment a vessel of at least 475 foot length. In addition, 9 public yards (8 Navy yards and 1 Coast Guard yard) are now employed only in military vessel repair but have done shipbuilding work in the past.

Total U.S. employment in public and private sector shipbuilding-related positions in 1984 averaged about a quarter of a million workers. The number of skilled "production" workers actually engaged in shipbuilding in private U.S. shipyards is currently about 96,000, and the public yards are scheduled to decrease their production workforce from 48,000 to 45,000 in 1985, which gives a total production workforce in U.S. shipyards of about 140,000 (Shipbuilders Council of America, 1985b). Although shipbuilding employment has decreased significantly in very recent years, the 1981 peak in private shipyard employment represented a 15-percent increase of 1971 levels, and the levels of the late 1970s and very early 1980s represented a post-World War II peak in shipyard employment. The current level of employment is sustained despite the fact that the U.S. private shipbuilding industry holds less than 2 percent of the world orderbook for commercial shipbuilding. This partly reflects the type of work being done in the U.S. shipyards—almost exclusively the building or repair of complex combatant vessels that are highly labor intensive.

Large-scale wartime construction of merchant sealift vessels (as was done in World War II) might be required in a protracted conflict. A NACOA review of shipyard mobilization capacity in the major defense-contract yards suggests considerable capacity exists—in workers, steel throughput and vessel tonnage output—in excess of what is being utilized in peacetime. The major constraint on expansion of wartime shipbuilding would not, NACOA believes, be limited shipyard capacity, but delayed availability of such major components as propulsion plants for Navy and merchant

vessels and complex weapons systems for combatant vessels.

The federally funded program for building and converting specially designed vessels for prepositioned supplies and for sealift and support will be completed in 1986. Several major shipyards involved in the program see no future work they can rely on to keep their facilities open, and the Shipbuilders Council of America warns that this shipbuilding capacity may disappear rapidly. In addition, the Council argues that peacetime shipbuilding and repair programs proposed by the Navy have not been fully funded in recent years, and a stretching out of the proposed programs with less shipbuilding work each year would support an even smaller shipyard base.

Surge requirements for U.S. shipyards for a major mobilization have been lowered, however, through several government initiatives: by increasing the amount of prepositioned military supplies and thus reducing the number of sealift ships needed; by building and converting a number of vessels under government control for sealift; by increasing the readiness of our reserve fleets and thus reducing the shipyard work required for activation; by relying more on conversion of existing commercial vessels than on wartime newbuilding of sealift vessels; and by planning more pre-mobilization work on commercial vessels in the U.S.-flag fleet. Indeed, much of the work now supporting private shipyards will improve the readiness of sealift assets to the point that less shipyard capacity would be required for a future mobilization.

The present shipyard capacity appears to be substantially greater than that which would be required for defense mobilization. NACOA believes sufficient shipyards will be kept open without new Federal supports—through military shipbuilding, military and commercial repair work and leasing or bonding of shipyard facilities to port authorities for commercial repair work—to meet the reduced mobilization needs. This will be especially true if the Nation's sealift assets are increased and improved as suggested in the recommendations that follow.

3. Requirements to build in U.S. shipyards have, in recent years, impaired the competitiveness of U.S. operators of oceangoing, self-propelled cargo vessels, and have contributed to the decline in the U.S.-flag fleet. Through subsidies, tax credits and increased freight rates, these measures also have imposed costs on the U.S. public at large. Despite their intent to support the domestic shipbuilding industry, the build-U.S. requirements have failed in recent years to create substantial commercial work in U.S. shipyards.

Such considerations as higher price, longer ship construction time and higher debt service on U.S.-built vessels—as well as a consequent lagging behind the

competition in upgrading capital assets—have affected the competitiveness of U.S. operators in foreign trades and the competitiveness of shipping against trucking, rail and tug/barge transport in the domestic trades.

The build-U.S. requirements were intended to guarantee work for U.S. shipyards to preserve a shipyard mobilization base. Except for defense contract work in the yards, however, newbuilding orders for ocean-going cargo vessels are minimal: none in 1983, only five in 1984 and none so far in 1985. Although the United States is the largest trading nation in the world, U.S. vessels carry only 6 percent of our foreign trade; domestic waterborne trade has been partially lost to pipelines, tug/barge, rail and truck carriage.

Many factors other than U.S. shipbuilding costs have contributed to this loss of cargo, or trading opportunities, for U.S.-flag vessels, but ship operators have asserted that U.S. ship construction costs are a major factor. The build-U.S. requirements thus are providing minimal help to the shipyards, while at the same time they are increasing capital and operating costs of the shipping industry, increasing costs to the U.S. public at large and discouraging modernization and expansion of the U.S.-flag fleet.

4. Most recent proposals to aid the U.S. shipbuilding industry—such as a federally funded merchant shipbuilding program, renewed construction subsidies, a federally backed maritime redevelopment bank, and expanded cargo preference—are either too small in scope to be of significant impact, do not address the most serious problems, or would create larger problems.

Several bills in the 98th and the 99th Congresses have proposed extension of the Construction Differential Subsidy or a direct Federal building program for merchant vessels, but would have been funded only enough to build about 3 to 5 vessels in a year—hardly enough to affect a significant part of the national shipbuilding base. The proposed Maritime Redevelopment Bank sought principally to improve capital formation for shipbuilding, but the industry generally believes capital formation is not really a problem if demand for ship construction is present—in fact, lack of demand for shipbuilding is the real problem. One proposal that would have ensured demand for ship construction was a cargo preference scheme requiring that a significant portion of U.S. wet- and dry-bulk imports and exports be carried in ships registered and built in the United States, with tax credits offered to exporters of major bulk cargoes to avoid placing the burden of higher shipping costs on them or on the producers of such goods. NACOA does not support such a cargo preference scheme, because the required new shipbuilding would add to present overtonnaging in the world bulk trades; the guaranteed market would not encourage competitiveness in

the shipping and shipbuilding industries; U.S. Federal rate setting in a world market for bulk cargoes, which is essentially unregulated, would be cumbersome and might discourage the use of U.S.-flag shipping or, worse, invite formal retaliatory actions in the form of comparable trade restrictions from other nations; and the combined costs to the taxpayer, from the proposed tax credits and from increased import and export prices, would be high. There are more efficient and less costly ways of ensuring sufficient seallift capacity, and more-than-sufficient shipbuilding capacity exists today.

Recommendations

Based upon these conclusions, NACOA offers the following recommendations on national policy for the shipping and shipbuilding industries, and related aspects of defense planning for seallift and shipyard mobilization base. The bases of the recommendations are discussed more fully in the body of the report. NACOA recommendations supporting the shipping industry will increase the Nation's merchant seallift assets and may increase commercial work in U.S. shipyards; the seallift readiness recommendations will increase the readiness of government-owned and commercial seallift vessels and concurrently will decrease the amount of U.S. shipyard mobilization base required for national defense needs.

1. NACOA recommends opposition to proposals for a Federal shipbuilding program for commercial seallift vessels—or any other program requiring major Federal funding—designed largely to provide peacetime work for U.S. shipyards and to preserve the present excess capacity in the shipbuilding base.

This recommendation does not apply to the ongoing ship construction and conversion program for specialized Military Seallift Command vessels designed for prepositioning, rapid deployment and other specific defense purposes.

A number of Congressional, academic, industry and government supporters of U.S. shipyards have proposed a Federal building program, in addition to these Military Seallift Command ships, for new militarily useful merchant vessels to be sold or leased to private operators or placed in reserve. NACOA believes this is not an efficient or cost-effective way of addressing the Nation's seallift problems. In such a Federal seallift shipbuilding program the taxpayer would pay for the vessels in three ways: (1) the taxpayer would incur the unnecessary expense of newbuilding in U.S. yards when comparable vessels can be built for much less overseas, and adequate already built vessels can currently be purchased in the United States and overseas at low costs; (2) the government-owned vessels would entail taxpayer-supported maintenance costs, even if

chartered or stored in reserve status; and (3) Federal subsidy or tax credit would likely be required to encourage private operators to charter militarily useful, commercially inefficient vessels in today's market conditions.

Building new vessels into an overtonnaged market is unlikely to produce commercial opportunities to recoup the government's investment, and newbuilding of vessels for laying up in reserve fleets is highly cost-ineffective when existing hulls can be purchased in U.S. or world markets at very low prices during the current shipping recession. The only justification for a major Federal shipbuilding program would be preservation of excess shipbuilding capacity for national defense needs. NACOA's review of national defense needs for the U.S. shipbuilding industry indicates that this and other forms of Federal support are unnecessary. Funding for peacetime military shipbuilding, conversion and repair is the only Federal support required for preserving a shipyard mobilization base adequate for a major conflict or national emergency.

2. With respect to government-owned merchant sealift vessels, NACOA recommends that:

- (a) In order to decrease the Nation's dependence on a government-owned and maintained Ready Reserve Force, the Navy and the Congress place greater emphasis on examining alternatives for increasing the numbers and the military usefulness of the operating U.S.-flag commercial fleet.**
- (b) The Navy and the Maritime Administration continue efforts to reduce the size and increase the readiness of the reserve sealift fleets, including continued scrapping of the World War II VICTORY ships and dispersing of the Ready Reserve Force vessels to locations nearer to planned activation sites.**

Because of a steady decline in the U.S.-flag fleet, a Ready Reserve Force (RRF) of high-readiness sealift vessels was established in 1976 within the National Defense Reserve Fleet, the Nation's "mothballed" merchant fleet. NACOA supports recent Department of Defense efforts to increase the readiness of the reserve fleets by replacing the World War II VICTORY ships, purchasing newer commercial vessels idled by the present shipping recession, and building (actually converting existing merchant hulls into) such special-purpose vessels as rapid cargo carriers, cargo-unloading crane ships and aviation support ships. Because of recently changed assumptions about the place, amount and especially the timing required for delivery of military equipment in a modern major deployment, defense guidance requires that some specially designed sealift assets be under immediate government control. Maintenance costs for the ships of the Ready Reserve Force, however, are almost \$1 million per vessel per year, when the costs of activation exercises are included, and the planned expansion

of this fleet would substantially increase its continuing maintenance costs. Exacerbating this problem is the fact that the average age of vessels recently purchased for the Ready Reserve Force is 27 years, which raises the likelihood that maintenance costs will increase rapidly, and replacement may be necessary soon. NACOA instead supports expanded efforts at finding cost-effective ways to adapt active commercial vessels, which are operated and maintained at private cost and have ready crews aboard, to meet defense needs.

Activations of Ready Reserve Force vessels are handled through general agency contracts with commercial shipping agents, with no government-coordinated plan to allocate towing assets or shipyard space to different reserve vessels under full mobilization. Although the ships of the Ready Reserve Force are maintained in high readiness (5, 10 or 20 days), continued attention should be given to possible activation delays imposed by "breaking out" and towing.

3. With respect to privately owned U.S.-flag merchant vessels, NACOA recommends that:

- (a) The Department of Defense and the Congress increase the emphasis on research and implementation of methods for adapting modern commercially efficient vessels to military purposes—rather than acquiring ships that have in the past been considered more "militarily useful" but can no longer be effectively used in peacetime trade.**
- (b) The Navy, the Small Business Administration and the Congress carefully examine the possibility of cost reductions in the proposed containership modification program.**
- (c) The Congress fund Department of Defense plans for Sealift Enhancement Features to be added to U.S.-flag merchant vessels in peacetime, with vessel owners fully compensated to the extent that such modifications interfere with commercial use of the vessel during installation and subsequent operations.**

Militarily useful vessels are defined according to size, draft, speed, unloading capability and capacity to carry specialized military cargos, such as large unit equipment (tanks and aircraft), or refined fuels and potable water. Unfortunately for military planners, the world's merchant ships have been growing in size and sophistication to provide fuel conservation and increased efficiency and have generally been changing in ways that make them increasingly less "militarily useful." Conventional wisdom, as evidenced in numerous past reports on shipbuilding and sealift, is that acquisition, or even the newbuilding, of non-commercially efficient vessels is necessary to satisfy defense sealift needs. Adherence to this policy would produce a government cargo fleet that could not operate

cost-effectively in peacetime and would thus be acquired and maintained only to serve in case of a national emergency. An additional consideration is that the very characteristics that make the general cargo vessels so attractive for sealift purposes—flexible breakbulk stowage and self-unloading capability—may come to be seen as a liability. As technology continues to develop for quickly unloading more modern vessels in austere environments, the slow and labor-intensive loading/offloading operations of the old breakbulk vessels may make their use less desirable. They would require more ready crew, trained in outmoded techniques, in a national emergency, and the slowness of cargo stowage and offloading would make these ships less timely in arrival and longer-term "targets" in unfriendly ports. NACOA supports DOD's initiatives to adapt its sealift plans to the commercial fleet of the present and future; and NACOA encourages expanded efforts in this direction.

One such effort seeks to modify U.S.-flag container ships to carry military unit equipment, through stacking of specially designed, oversized, open-topped "containers" (seasheds) and large pallets (flatracks). This would essentially allow breakbulk loading and offloading operations within a containership "hold." While NACOA supports the concept, NACOA concurs with industry sources who believe the costs of the federally funded program are unnecessarily high and should be reexamined. A standard 40-foot container costs about \$4,000, while open-topped, oversized, strengthened "seasheds," each having a self-activated, hinged opening floor, cost \$157,000 each. The problem may lie in the approach, the design, the procurement mechanism or in all three.

Because modern defense scenarios call for rapid availability of sealift assets, timely use of private commercial vessels requires the installation of "Sealift Enhancement Features" in peacetime. The Civil Reserve Air Fleet (CRAF) of privately owned U.S. cargo aircraft has been undergoing pre-mobilization enhancements for several years. In 1984, about \$100 million was spent to adapt aircraft doors and decks for emergency loading of military equipment. The Department of Defense has in its FY 1986 budget a request for almost \$67 million to modify commercially active U.S.-flag vessels to increase their capabilities for communication, underway refuel, self-defense and offloading in austere and unfriendly environments. For the minimal cost of reimbursing ship operators for lost revenues, this program will enhance the readiness of privately owned sealift assets, will reduce the shipyard time required for mobilization and also will decrease the need for expanded government-controlled fleets. NACOA supports this effort and believes it should be fully funded. In addition, the Navy recently announced a new program (Kesteloot, 1985b) to offer upfront payment for costs associated with addition of

Sealift Enhancement Features in new U.S.-built vessels to aid in capital formation and encourage newbuilding of vessels for the U.S.-flag fleet. NACOA supports this initiative but suggests that the Navy also consider retrofitting, with Sealift Enhancement Features, U.S. vessels built in foreign shipyards and selected U.S.-owned vessels under foreign registry considered most adaptable to military use.

4. NACOA recommends that the Navy take steps to ensure the availability, training and readiness of U.S. crews needed for mobilization of reserve and foreign-flag sealift vessels; that the Navy seek, and the Congress appropriate, funding for an enhancement of the Navy's Merchant Marine Reserve.

Current Navy initiatives are directed at identifying specific billets on all vessels (including foreign-flag ships of the Effective U.S.-Control Fleet) that would be required for mobilization, and at seeking agreements with seagoing labor unions to identify qualified active personnel, to keep updated information on their whereabouts at all time, and to provide necessary readiness training through union schools.

In addition to these efforts, NACOA believes such agreements should be formalized by designating the mobilization billets for officers in the Navy's Merchant Marine Reserve, and this Reserve program should be revamped to attract sufficient qualified active and inactive seagoing personnel to fill all these billets.

5. NACOA recommends that the Administration and the Congress continue to unlink national shipping and shipbuilding policies by eliminating all requirements for U.S.-flag operators receiving government supports to build vessels in U.S. shipyards.

We recommend specific amendments to the Merchant Marine Act of 1936 to:

- (a) Allow permanent authority for U.S. operators to build vessels in foreign shipyards and still receive Operating Differential Subsidy, or whatever supports or incentives may replace that subsidy, for operating in the U.S. foreign trades.**
- (b) Allow Capital Construction Fund deferral of taxes on shipping if reinvested in foreign-built, as well as U.S.-built new vessels.**

In addition, we recommend:

- (c) Revision of regulations and administrative practice to allow Title XI Federal Ship Loan Guarantees for foreign vessel construction, with priority on loan guarantees that will provide growth and replacement in trades not already overtonnaged.**
- (d) Amendment of the provisions in various laws regarding eligibility to carry government-impelled cargo—to allow immediate eligibility to a foreign-built vessel rather than the presently required 3-year wait.**

This reiterates a recommendation in NACOA's 1983 report on marine transportation that "U.S. shipowners should be permitted to qualify for ODS with respect to foreign-built vessels registered under the U.S.-flag." However, based on the present review of shipping and shipbuilding and their national defense roles, NACOA has reversed its 1983 report recommendation that the "Title XI and Capital Construction Fund programs should be preserved by the Maritime Administration with their benefits remaining applicable solely to vessels of U.S. registry constructed in U.S. shipyards."

These U.S.-built requirements are intended to preserve excess shipbuilding capacity in peacetime to ensure an adequate shipyard mobilization base for national defense needs. As discussed in our conclusions above, NACOA believes it is unreasonable to hamper the competitiveness of U.S. ship operators to preserve the Nation's shipbuilding base. Further, the national defense arguments for preserving a large peacetime shipbuilding capacity have been overused. In addition, the "build-U.S." requirements are not having the effect of creating significant commercial orders in U.S. shipyards. The national defense needs for sealift require more concentration on U.S.-owned, flagged, or controlled ships—and trained U.S. crews—rather than on yard capacity. Thus, measures must be taken to free the U.S. shipping industry from unnecessary and ineffective restrictions.

NACOA offers three additional recommendations designed to encourage growth of the U.S.-flag fleet, which could provide additional sealift assets without government funding for shipbuilding, acquisition or maintenance, and also would provide more ready U.S. crew for mobilization.

6. NACOA recommends that Congress amend current maritime statutes that impair the competitiveness of U.S. vessels in foreign trade. Specifically, we recommend:

- (a) Establishment of a new form of operating incentives, under short-term (5-year) contracts that are linked to the success of measures to reduce crew size and operating costs.**
- (b) Amendment of the ad valorem tax provision in the Tariff Act of 1922 to exempt oceangoing, self-propelled cargo ships from the duty on non-emergency foreign shipyard repairs.**
- (c) Amendment or repeal of such shipboard manning laws and regulations as the "Cross-over Law" and the "Three-Watch Law" to allow reductions in U.S. vessel crew size comparable to those of most other major seafaring nations.**

The U.S.-flag fleet must be allowed the freedom to be competitive in the world market if it is to expand and increase its utility as a defense sealift asset—both in

vessels and trained seafaring crew. Some form of operating support will be required to allow U.S. vessels to compete in foreign trades while the fleet is being replaced with low-cost, foreign-built vessels, and the crew size and costs are coming down. NACOA proposes a short-lived (5-year) program of operating incentives be made available to all U.S.-flag operators in foreign trades, even those not currently subsidized, during the transition period while fleet modernization and effective manning are being achieved. The supports should definitely not be linked to the U.S./foreign cost differential but should be annual fixed payments, based on some measure such as vessel tonnage, and providing bonuses for improved efficiency, as do the Navy's "Incentivized" shipbuilding contracts. Such "Operating Incentive Payments" should be set at an initial level similar to current Operating Differential Subsidy, but should be phased down over the 5-year period. Other costs of U.S. operation would meanwhile be reduced by our recommendations that building and repairing of ships in foreign shipyards be allowed for U.S. operators in foreign trades.

Currently, less than 200 U.S.-flag vessels are in foreign trades. Lack of competitiveness of U.S. vessels in the world market is due not only to the higher capital costs of U.S. shipbuilding, but also to ship repair and crew costs. U.S. crew costs are 2 to 3 times higher than those of other major maritime nations, and up to 5 and 6 times higher than those of developing nations. Dramatic reductions in crew costs have been accomplished in western Europe and Japan, without reducing wages, by substantially decreasing crew size and increasing job security. Similar improvements in U.S. crew size and wages have been made very recently, with non-union U.S. wages roughly comparable to those of western Europe. However, U.S. crew costs cannot be reduced to those of developing nations because of the relatively high U.S. standard of living. The progress of continued reforms in this country will require temporary exemptions from, and eventually amendments to or repeal of, U.S. Coast Guard manning regulations and shipboard manning laws to allow continued progress in effective manning.

7. NACOA recommends that the Administration and the Congress develop a package of incentives, in addition to those in recommendations #5 and #6, to attract foreign-registered vessels—under U.S. or foreign ownership—to the U.S. flag. We recommend that such set of incentives include a liberalizing of registry regulations for reflagged vessels, giving assurances to owners that they may easily "flag out" again during a certain number of years.

Any measures that improve the competitive position of U.S.-flag vessels—such as the access to foreign shipbuilding and repair, immediate access to government-impelled cargos, "Operating Incentives

Payments" and forced reduction of crew costs, as proposed in Recommendations #5 and #6—also could be considered as possible incentives to encourage reflagging of some U.S.-owned vessels under foreign registry. Several additional possibilities for encouraging reflagging are discussed in Chapter 4 of this report. Such incentives also might attract some foreign-owned vessels under foreign registry, especially those of developed nations.

Reflagging incentives might simply move vessels of the Effective U.S.-Control fleet or of our NATO allies—already designated as sealift assets—into the U.S.-flag fleet. This would still enhance U.S. sealift readiness, however, because more U.S.-flag vessels would provide jobs and training for U.S. seafaring crews, and allow for Sealift Enhancement Features to be added in peacetime, which would make the vessels more ready for mobilization.

An increased fleet under U.S.-flag control would be highly desirable for defense sealift needs, and could reduce the need for expansion of the government-owned reserve fleets.

8. NACOA recommends amendment of the Jones Act to allow a 10-year "coproduction" period of some U.S. and some foreign building of new commercial cargo ships for the Jones Act domestic trade. We recommend that these provisions be applicable only to large oceangoing, self-propelled, cargo-carrying ships that are capable of contributing to the Nation's sealift needs in the case of a national emergency. We further recommend that provisions be written so that U.S. operators may earn credits for orders placed in U.S. shipyards and use those credits for an equal dollar amount of construction or conversion orders in foreign shipyards; we believe such credits should be transferable.

In the past few years, the "build-U.S." requirement for vessels in the domestic trade has done very little to expand or modernize the fleet or to provide work for U.S. shipyards—in 1983, no new oceangoing cargo vessels for the Jones Act were ordered, only five were ordered in 1984, and there have been no new orders

so far in 1985. Carriage of dry cargo is shifting from coastwise ships to oceangoing tug and barge carriage, and to truck and rail modes, and the Jones Act fleet of oceangoing, self-propelled dry cargo ships is aging and shrinking. A 10-year "coproduction" period might encourage modernization and possible expansion of the Jones Act fleet and its seafaring jobs. Reduced operating costs—with modern, efficient and less expensive foreign-built vessels having reduced crews—might allow expansion of the waterborne, coastwise market by taking some freight from oceangoing tug/barge carriage and some intercity cargoes from truck and rail carriage. In this way, such a coproduction scheme could strengthen the Jones Act fleet.

By excluding small coastal vessels and tugs and barges from the coproduction provisions, we would protect the small U.S. shipyards from competition with low-cost foreign building of tugs and barges. We may, however, increase the relative competitiveness of larger, oceangoing cargo ships by allowing some foreign building of these vessels. This is consistent with the purposes of the NACOA report, because it would give a possible competitive advantage to the larger, self-propelled vessels that contribute to the Nation's sealift capacity.

Protections would have to be designed so that domestic operators now using high-cost vessels built in U.S. yards, as required by the Jones Act, would not be seriously undercut by competitors entering the trade with less expensive foreign-built vessels. Some approaches to providing such protections are outlined in Chapter 4 of this report.

NACOA strongly supports retention of the U.S.-ownership and U.S.-crew requirements of the Jones Act, because these vessels operate in our coastal waters and are an important part of our national sealift assets.

Because every U.S.-flag vessel deemed to be militarily useful by the Department of Defense would be used in a major mobilization, any continued decrease in the Jones Act fleet affects the defense sealift capacity of the Nation. NACOA believes coproduction could enhance the Nation's sealift capacity.

**THE JONES ACT AND ITS IMPACT
ON THE STATE OF ALASKA**

VOLUME I: EXECUTIVE SUMMARY

Prepared for the

ALASKA STATEHOOD COMMISSION

by

SIMAT, HELLIESEN & EICHNER, INC.

SHE

July 1982

TABLE OF CONTENTS

BACKGROUND	1
<u>The Jones Act</u>	1
<u>Factors Leading Up to Passage of the Act</u>	2
EXCEPTIONS TO THE ACT	2
THE JONES ACT FLEET	2
ALASKA WATERBORNE TRADE	3
ALASKAN SHIPPING COSTS	
<u>The Impact of Costs on Rates</u>	6
<u>Shipping Costs</u>	6
<u>U.S.-flag Cost Disadvantages</u>	7
<u>U.S.- vs. Foreign-flag Shipping Comparisons</u>	7
THE IMPACT OF SHIPPING COSTS DUE TO THE JONES ACT	
<u>Open Questions About the Jones Act</u>	12
<u>The Impact of the Act on Liner Services</u>	12
<u>The Impact of the Act on the Crude Oil Trades</u>	13
MAJOR CONCLUSIONS	
<u>The Jones Act and Alaska's Liner Service</u>	13
<u>The Jones Act and Alaska's Crude Oil Transportation Service</u>	14
<u>Current Use of Exemptions from the Act</u>	14
<u>Changes in U.S. Maritime Policy</u>	14

LIST OF TABLES AND FIGURES

TABLE 1:	Proportion of Jones Act Vessels to Total U.S.-flag Vessels	4
TABLE 2:	U.S.-flag Privately-owned, Self-propelled Vessels of 1,000 Gross Tons or More - January 1, 1982	4
FIGURE 1:	Cargo Activity of Corps of Engineers Top 10 Alaska Ports	5
TABLE 3:	Summary of U.S.- and Foreign-flag Costs for Containership Operations - Anchorage/Seattle	8
TABLE 4:	Summary of U.S.- and Foreign-flag Costs for Ro/Ro Ship Operations - Anchorage/Seattle	9
TABLE 5:	Summary of U.S.- and Foreign-flag Costs for VLCC Operations - Valdez/Los Angeles	10
TABLE 6:	Summary of U.S.- and Foreign-flag Costs for Product Tanker Operations - Los Angeles/Anchorage	11

BACKGROUND

The purpose of the study is to provide "an expert and objective analysis of the economic effects of the Merchant Marine Act of 1920 (The Jones Act) on the economy of Alaska," considering:

- The costs which the Act adds to the ultimate price of important classes of freight coming to and leaving Alaska;
- The effect of the Act on the cost and standard of living in Alaska;
- The effect the Act has upon further development and expansion of shipping-dependent industries;
- The composition of the U.S.-flag Jones Act fleet;
- The effects higher shipping costs have on state revenues;
- Other important effects the Act may have upon Alaska's economy, resources, and future development.

The Jones Act

The term "Jones Act" refers to Section 27 of the Merchant Marine Act of 1920, which states:

No merchandise shall be transported by water, or by land and water,....between points in the U.S.....either directly or via a foreign port or for any part of the transportation, in any other vessel than a vessel built in and documented under the laws of the U.S. and owned by persons who are citizens of the U.S....

Because Section 27 restricts U.S. domestic waterborne trade to vessels of U.S. construction, U.S. registration, and U.S. ownership, the Jones Act has come to be referred to as the U.S. cabotage law. Cabotage refers to the reservation of a nation's domestic cargo to ships of that nation's fleet. It could be described as a form of protectionism applied to transportation services. In fact, the purpose of the Merchant Marine Act of 1920 is stated clearly in the preamble of the Act:

That it is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned and operated privately by citizens of the United States....

Factors Leading Up to Passage of the Act

To understand why the Merchant Marine Act of 1920 was enacted, it is first necessary to review the U.S. experience in World War I.

At the beginning of World War I in 1914, the British maintained the world's largest merchant fleet with over 8,500 vessels. The remaining protagonists, together with Britain, accounted for over 14,000 vessels or nearly 60 percent of the world fleet and over 65 percent of the world's tonnage.

As the warring nations recalled their merchant fleets to military service or lost them in action on the high seas, the U.S. began to experience a crippling scarcity of vessels for its on-going commerce. Commodities and goods were left literally rotting on the piers. A major shipbuilding program to provide the country with the ships necessary to carry men and materials to Europe for an extended war was undertaken. However, only a few vessels were delivered before the armistice ending World War I was declared in November of 1918.

The experience of World War I indicated to U.S. lawmakers the dangers of relying on foreign-flag fleets. In the summer of 1919, the Senate Commerce Committee chaired by Wesley L. Jones, Republican from the State of Washington (1909 to 1932), began working on a revision of the national maritime laws. Under Jones' direction the Merchant Marine Act of 1920 was passed into law.

EXCEPTIONS TO THE ACT

A variety of circumstances and conditions have resulted in differing exceptions to the Jones Act for some territories and states. The third and fourth proviso exceptions to Section 27 of the Merchant Marine Act of 1920 are examples of exceptions that apply to Alaska. For practical purposes, the third proviso allows the use of foreign owned, registered, and built ships for carrying cargoes between Alaska and the lower 48 states via Canadian ports so long as rail movement is involved, while the fourth proviso applies to movements on the Yukon River.

There are other exceptions. For instance, trade with the U.S. island possessions of Guam, Tutuila (American Samoa), Wake, Midway and Kingman Reef may be carried on foreign built U.S.-flag vessels.

Of direct interest to Alaska are the conditions that govern trade to the Virgin Islands. For historical reasons, the Virgin Islands are exempt from the Jones Act. As a result, Alaskan crude oil can be shipped out of Alaska on foreign-flag vessels to a refinery in the Virgin Islands. The product can then be shipped foreign-flag to the U.S. mainland. Data compiled by the Maritime Administration indicate that this route accounts for about 5 percent to 15 percent of Alaskan oil shipments.

THE JONES ACT FLEET

The Jones Act fleet consists of those vessels eligible to engage in the coastwise trade. Generally, that includes any vessels built in the U.S., under

U.S. ownership, registered under the laws of the U.S., and not restricted because of subsidy status. Vessels that have received Construction Differential Subsidy (CDS) or are receiving Operating Differential Subsidy (ODS) from the Maritime Administration cannot serve the cabotage or coastwise trade without special waivers.

Currently, the Jones Act fleet accounts for 60.7 percent of U.S.-flag tonnage. Most of these vessels are tankers; in that category, 86.8 percent of all vessels are eligible for coastwise trading. Data appear in Table 1.

The Alaska trade fleet of six^{1/} dry cargo freighters and 88 tankers constitutes 28.8 percent of the Jones Act fleet and 16 percent of the active U.S.-flag privately owned fleet.

Alaska trade freighters constitute only 8.6 percent of the total Jones Act eligible freighters. The containerships are smaller than those generally found in the Jones Act fleet and the Ro/Ro ships are larger. Among tankers, the Alaska trade fleet is made up of 34.4 percent of the total Jones Act fleet, but has 54 percent of the carrying capacity. This is because tankers in Alaska service are larger than the fleet average. Data appear in Table 2.

ALASKA WATERBORNE TRADE

Alaska's waterborne commerce is dominated by crude oil shipments from Valdez which accounted for 89.5 percent of Alaska's total port activity in 1979. When crude oil shipments are subtracted from the total, remaining waterborne commerce is 34.5 percent foreign imports and exports, 47.5 percent coastwise receipts and shipments, and 18 percent internal receipts and shipments. Data illustrating the relationship of total foreign, coastwise, and internal movement of the top ten Alaska ports is shown in Figure 1. Excluding crude oil shipments, the activity of the top ten Alaska ports includes approximately 60 percent of the state's total waterborne commerce.

Coastwise dry cargo shipments out of Alaska move primarily to the Pacific Northwest (Seattle and Tacoma). Of the total, 51.2 percent move to the Pacific Northwest, California receives 15.9 percent, and internal shipments within Alaska account for the remaining 32.9 percent.

Tanker movements from Alaska are destined primarily for refineries in California. Panama, the Pacific Northwest, and Hawaii also receive varying amounts of Alaska crude, based on the 1979 data.

Coastwise dry cargo shipments to Alaska originate to a large degree in the Pacific Northwest (77.3 percent). A very high proportion of the cargo moving to and from Alaska's smaller ports is transshipped via the major ports.

^{1/} Includes Sea-Land and TOTE; excludes barge services.

TABLE 1
PROPORTION OF JONES ACT VESSELS
TO TOTAL U.S.-FLAG VESSELS

	Number of Vessels			DWT (000)		
	<u>Jones Act</u>	<u>Total</u>	<u>%</u>	<u>Jones Act</u>	<u>Total</u>	<u>%</u>
A. DRY CARGO	70	280	25.0	1,119.0	5,123.7	21.8
B. TANKERS	<u>256</u>	<u>295</u>	<u>86.8</u>	<u>11,950.3</u>	<u>16,409.2</u>	<u>72.8</u>
C. TOTAL	<u>326</u>	<u>575</u>	<u>56.7</u>	<u>13,069.3</u>	<u>21,532.9</u>	<u>60.7</u>

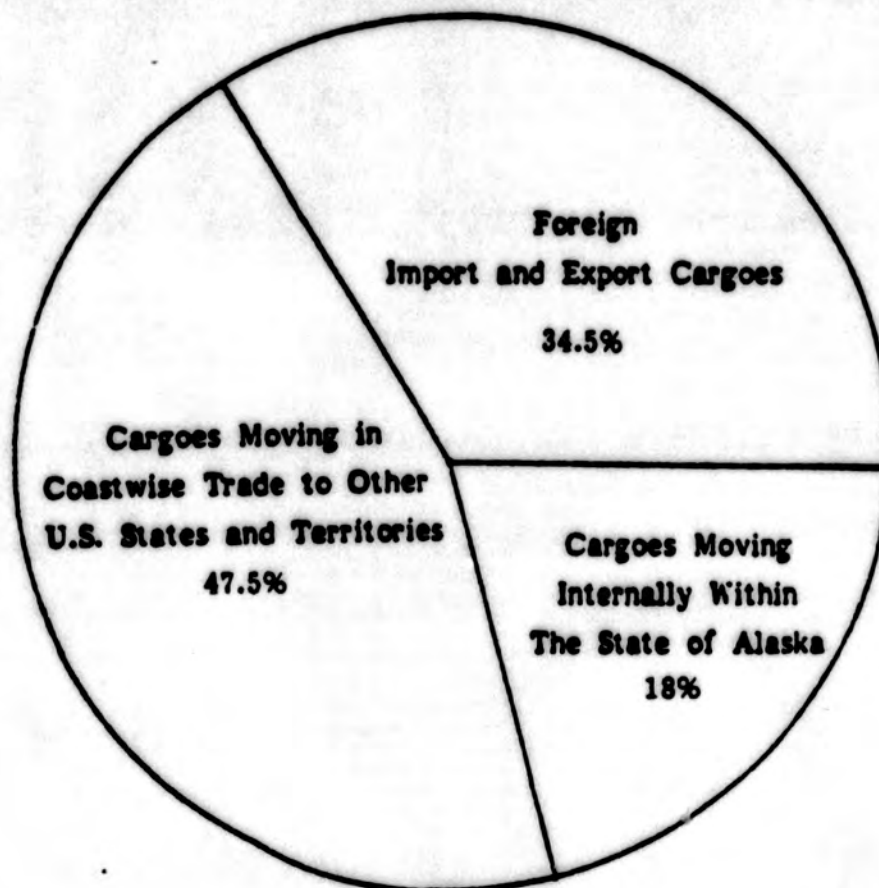
TABLE 2
U.S.-FLAG PRIVATELY-OWNED, SELF-PROPELLED VESSELS
OF 1,000 GROSS TONS OR MORE
January 1, 1982

	<u>Serving Alaska</u>	<u>Total Jones Act</u>	<u>% Serving Alaska</u>	<u>Serving Alaska</u>	<u>Total Jones Act</u>	<u>% Serving Alaska</u>
A. FREIGHTERS	6	70	8.6	64.7	1,119.0	5.8
B. TANKERS	<u>88</u>	<u>256</u>	<u>34.4</u>	<u>6,513.8</u>	<u>11,950.3</u>	<u>54.5</u>
C. TOTAL JONES ACT FLEET	<u>94</u>	<u>326</u>	<u>28.8</u>	<u>6,578.5</u>	<u>13,069.3</u>	<u>50.3</u>

1/ Privately-owned, self-propelled vessels of 1,000 gross tons or more -
January 1, 1982

Source: U.S. Maritime Administration

FIGURE 1
CARGO ACTIVITY OF CORPS OF ENGINEERS TOP 10 ALASKA PORTS
(EXCLUDING CRUDE OIL AT VALDEZ)
BASED ON TONS OF CARGO SHIPPED AND RECEIVED
1979



Tanker cargo being received in Alaska, consisting of petroleum products for consumption in the state, flows almost exclusively from California; a high percentage is redistributed from larger to smaller Alaska ports.

Anchorage is the primary receiving port for consumer products, building materials, and food. Whittier also serves the Anchorage market with the same categories of cargo. Most of the high volume cargoes (commodities registering annual volumes of 10,000 tons or more) moving into Alaskan ports other than Anchorage and Whittier, consist of petroleum products.

ALASKAN SHIPPING COSTS

The Impact of Costs on Rates

The cost of shipping in the Alaska trade, and the cost premium caused by the Jones Act, were estimated by comparing the cost of present vessel services with the probable cost of those services were they operated with foreign-flag ships. Although it is true that the observed impact on customers is conveyed through shipping rates, not underlying shipping costs, and that competition and value of service, or "what the traffic will bear," establish freight rates for each commodity in the short run, costs set the limits for freight rates in the long term. In other words, although cost and rate may not be the same or even similar for any given commodity at any given time, in the long run (and/or over a mixture of commodities carried in the same service), rates are, in fact, cost determined. Hence, the cost-based method is a valid approach for determining the relative impact of differing governmental policies which affect the long term character of a shipping market.

Shipping Costs

Ocean shipping costs can generally be divided into the following categories:

- Capital
- Manning and Subsistence
- Fuel
- Maintenance and Repair (M&R)
- Supplies and Equipment
- Insurance
- Cargo Handling
- Other Port Costs
- Agency, brokerage, and Commission
- Waterway Tolls and Pilot Fees
- Corporate Overhead

There are exceptions, however. For example, tanker movements seldom involve meaningful cargo handling costs, because this function is provided by shipboard pumps, the cost of which is already part of other cost categories. Other types of shipping have other costs—e.g., container ownership in the case of container systems.

U.S.-flag Cost Disadvantages

Among the categories listed, not all are areas in which there are cost differences between U.S.- and foreign-flag vessels. The major areas in which U.S.-flag vessels are at a disadvantage are:

- Crew wages — Generally, U.S. manning costs are higher, due in part to higher rates of compensation and in many cases, higher manning levels.
- Insurance — Insurance is usually higher because of higher U.S. vessel repair costs and typically higher levels of medical care, workmen's compensation, etc.
- Vessel acquisition — Vessel acquisition costs are higher because of higher U.S. construction costs. In addition, delivery schedules in the U.S. are said to be much slower, introducing a cost of delay. The requirement for U.S. subsidized operators to purchase U.S.-built vessels has been temporarily waived, allowing U.S.-flag carriers to buy vessels overseas at cheaper prices. This does not apply in the domestic trades, however.
- Vessel Maintenance and Repair — Vessel M&R is higher due to the necessity for making repairs in the U.S.
- Overhead — Overhead is sometimes higher due to higher general levels of salary for U.S. headquarters office staffs, to the extra staff required for government compliance activity, and the fact that foreign lines use agents in the U.S.
- Fuel Costs — In most cases U.S. fuel costs are higher because steam turbine vessels are employed which have higher fuel consumption rates than foreign-flag vessels that traditionally use slow speed diesel engines.

U.S.- vs. Foreign-flag Shipping Comparisons

The SH&E Required Freight Rate model was used to calculate costs of U.S. and hypothetical foreign-flag vessels in a representative sample of Alaskan service, focusing on cost differences in the categories set out above. Summary results from four runs appear in Tables 3-6, as follows:

Table 3	-	Container vessel: Seattle-Anchorage
Table 4	-	Roll on/Roll off vessel; Tacoma-Anchorage
Table 5	-	Crude Oil Tanker; Valdez-Los Angeles
Table 6	-	Petroleum Products Tanker; California to various Alaskan ports.

TABLE 3

**SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR CONTAINERSHIP OPERATIONS
ANCHORAGE/SEATTLE**

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>
MANNING AND SUBSISTENCE	70,637.14	75.95
FUEL	63,448.54	68.22
M-R	10,285.71	11.06
SUPPLIES AND EQUIPMENT	1,182.86	1.27
INSURANCE	9,485.71	9.12
CAPITAL COSTS	30,857.14	33.18
STEVEDORING COSTS	87,750.00	94.35
TERMINAL COSTS	241,800.00	260.00
PORT COSTS	60,000.00	64.52
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CONTAINER COSTS	76,371.43	82.12
POSITIONING COSTS	143,000.00	153.76
FEEDER TRANSPORTATION COSTS	0.00	0.00
AGENCY, BROKERAGE, AND COMMISSION	18,600.00	20.00
CORPORATE OVERHEAD	<u>169,356.13</u>	<u>182.10</u>
TOTAL	981,774.66	1,055.67

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>
MANNING AND SUBSISTENCE	81,040.00	84.13
FUEL	45,215.96	48.62
M-R	9,000.00	9.68
SUPPLIES AND EQUIPMENT	1,182.86	1.27
INSURANCE	4,937.14	5.31
CAPITAL COSTS	15,428.57	16.59
STEVEDORING COSTS	87,750.00	94.35
TERMINAL COSTS	241,800.00	260.00
PORT COSTS	60,000.00	64.52
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CONTAINER COSTS	76,371.43	82.12
POSITIONING COSTS	143,000.00	153.76
FEEDER TRANSPORTATION COSTS	0.00	0.00
AGENCY, BROKERAGE, AND COMMISSION	18,600.00	20.00
CORPORATE OVERHEAD	<u>106,332.79</u>	<u>114.34</u>
TOTAL	850,558.24	914.69

TABLE 4
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR RO/RO SHIP OPERATIONS
ANCHORAGE/SEATTLE

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>
MANNING AND SUBSISTENCE	54,940.00	49.50
FUEL	80,303.27	72.35
M-R	5,000.00	4.50
SUPPLIES AND EQUIPMENT	900.00	0.81
INSURANCE	11,600.00	10.45
CAPITAL COSTS	72,000.00	64.86
STEVEDORING COSTS	76,500.00	68.92
TERMINAL COSTS	288,600.00	260.00
PORT COSTS	44,000.00	39.64
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CONTAINER COSTS	36,382.50	32.78
POSITIONING COSTS	176,000.00	158.56
FEEDER TRANSPORTATION COSTS	0.00	0.00
AGENCY, BROKERAGE, AND COMMISSION	24,200.00	21.80
CORPORATE OVERHEAD	153,604.55	138.38
TOTAL	1,024,030.32	922.55

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>
MANNING AND SUBSISTENCE	31,820.00	28.76
FUEL	57,906.61	52.17
M-R	4,000.00	3.60
SUPPLIES AND EQUIPMENT	900.00	0.81
INSURANCE	6,240.00	5.62
CAPITAL COSTS	36,000.00	32.43
STEVEDORING COSTS	76,500.00	68.92
TERMINAL COSTS	288,600.00	260.00
PORT COSTS	44,000.00	39.64
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CONTAINER COSTS	36,382.50	32.78
POSITIONING COSTS	176,000.00	158.56
FEEDER TRANSPORTATION COSTS	0.00	0.00
AGENCY, BROKERAGE, AND COMMISSION	24,200.00	21.80
CORPORATE OVERHEAD	106,724.88	96.15
TOTAL	889,373.98	801.24

TABLE 5
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR VLCC OPERATIONS
VALDEZ/LOS ANGELES

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	224,588.74	1.87
MANNING AND SUBSISTENCE	86,990.71	0.72
FUEL	227,090.91	1.89
M-R	11,729.44	0.09
SUPPLIES AND EQUIPMENT	3,743.15	0.03
INSURANCE	23,956.13	0.20
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	140,000.00	1.17
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	717,599.08	5.98

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	112,294.37	0.94
MANNING AND SUBSISTENCE	86,714.46	0.39
FUEL	227,090.91	1.89
M-R	7,886.29	0.06
SUPPLIES AND EQUIPMENT	3,743.15	0.03
INSURANCE	13,924.50	0.12
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	140,000.00	1.17
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	551,253.68	4.59

TABLE 6
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR PRODUCT TANKER OPERATIONS
LOS ANGELES/ANCHORAGE

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	102,285.71	2.92
MANNING AND SUBSISTENCE	131,266.87	3.78
FUEL	154,833.33	4.42
M-R	4,546.03	0.13
SUPPLIES AND EQUIPMENT	11,365.08	0.32
INSURANCE	22,730.16	0.65
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	21,600.00	0.62
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	448,626.98	12.82

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	51,142.86	1.46
MANNING AND SUBSISTENCE	86,826.87	1.91
FUEL	98,250.00	2.81
M-R	3,977.78	0.11
SUPPLIES AND EQUIPMENT	11,365.08	0.32
INSURANCE	13,979.05	0.40
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	12,000.00	0.34
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	257,541.43	7.36

These summary runs indicate that the relative impact of the Jones Act on Alaskan commerce varies with specific circumstances. For example, in liner trades^{1/} (represented by container and Ro/Ro vessels) a significant part of the total cost relates to containers, cargo handling, and other cargo-related functions. These are not affected by the Jones Act. Hence, the relative cost difference between U.S.- and foreign-flag vessel service is less than, say, the tanker trades, where Jones Act-affected cost categories make up a much larger share of the total cost.

THE IMPACT OF SHIPPING COSTS DUE TO THE JONES ACT

Open Questions About the Jones Act

There are a number of unanswered questions relating to changing or eliminating the Jones Act. They include:

- Is it preferable to remove all provisions of the Act or a selected subset?
- What is the likely response by foreign shipping interests to a relaxation of the coastwise laws? On what terms would foreign owners and operators be interested in providing service?
- What immigration problems, if any, would result from employing foreign seamen in the Alaska coastwise trade?
- If foreign-flag operations can be introduced at great savings, what has impeded foreign-flag vessels from being used more extensively to carry coastwise cargoes via Canadian ports?
- What will be the U.S. labor reaction to the introduction of foreign ships and foreign crews and what secondary effect might this have on Alaska?

The Impact of The Act on Liner Services

The total U.S.-flag premium cost for liner services in the Alaskan trade (i.e., services which transport package cargo such as consumer goods, automobiles, machinery, etc.) is about \$41 million per year, as follows:

	<u>Container</u>	<u>Ro/Ro</u>	<u>Tug Barges</u>
Cost per trip - U.S.-flag	\$981,774	\$1,024,030	\$195,217
Cost per trip - foreign-flag	<u>850,858</u>	<u>889,373</u>	<u>158,023</u>
Net	\$131,116	\$134,657	\$37,188
Voyages per year	<u>X 155</u>	<u>X 100</u>	<u>X 200</u>
	\$20,322,980	\$13,465,700	\$7,437,600
	<u>GRAND TOTAL</u>		<u>\$41,226,280</u>

^{1/} "Liner trades" refers to all ocean freighter services which handle packaged and piece goods, in contrast to "bulk trades" which handle petroleum, grain, ore, and other bulk commodities.

The cost penalty applies to commodities as a group. How it may be distributed to any specific commodity or group of commodities is uncertain; if any one item is judged to pay less premium, then something else must automatically be said to pay more, and the net result to the people of Alaska is essentially the same.

With regard to the relative impact of the Act on inbound versus outbound commodities, the analysis indicates it is northbound liner commodities which are most likely absorbing the cost premium, meaning the direct (or initial) impact of the Jones Act is falling more heavily on Alaskan receivers and consumers rather than on Alaskan businesses shipping their products southbound.

The Impact of the Act on the Crude Oil Trades

With regard to crude oil, the RFR analyses indicated the differential between U.S.- and foreign-flag tanker operations in the Valdez to Los Angeles service is \$1.39 per long ton. For shipments from Valdez, transshipped at the Panama Canal and sent onward to the U.S. Gulf Coast, the differential would be \$5.67.

Assuming an average annual U.S.-flag shipment rate of 80 million tons per year, with two-thirds moving to California and one-third to the Gulf Coast via Panama, the annual cost penalty ultimately being borne by Alaska through the netback mechanism is \$225 million. Clearly, the Jones Act's major impact on Alaska is in the sphere of crude oil shipments.

MAJOR CONCLUSIONS

The Jones Act and Alaska's Liner Service

- Commerce of the State of Alaska moving in liner services, mostly consumer goods and business supplies, is absorbing an aggregate annual cost of approximately \$41 million because of the restrictions imposed by the Merchant Marine Act of 1920.
- Due to the inherent directional imbalance of Alaska cargoes, the incidence of higher costs and rates is having the greatest impact on northbound cargoes.
- In the high-volume Anchorage-Pacific Northwest trade, the state may have a potential for reducing rates by stimulating backhaul cargoes. The extra cost of transportation for such cargoes would be low.
- In modern containerized-type operations, the bulk of the costs are not flag related. Consequently, the scope for cost and rate reductions as a result of introduction of foreign-flag services is not as great proportionately as in other sectors of the merchant marine.

The Jones Act and Alaska's Crude Oil Transportation Service

- Alaska's net return from its oil sales is being reduced due to the additional costs imposed by the Jones Act, which, based on current conditions, are approximately \$225 million per year.

Current Use of Exemptions from the Act

- The State of Alaska has some relief available from the Merchant Marine Act of 1920. This relief is currently not being exploited. Non-use of this loophole does indicate that the cost savings ultimately available from use of foreign-flag vessels may not be as great as has sometimes been supposed.

Changes in U.S. Maritime Policy

- In view of the Administration's apparent position to uphold the Jones Act, efforts to have it rescinded in toto will be difficult in the immediate future.
- Given the recent lifting of prohibitions on overseas-built vessels for U.S. subsidized trades, the State of Alaska may wish to consider an effort to obtain a waiver of the requirement to use vessels built in the U.S. and place less emphasis on changing the remainder of the Jones Act.
- The State of Alaska should develop a coordinated, thoroughly-considered Jones Act strategy that seeks reasonable and politically attainable concessions in areas where the cost impacts are most meaningful. This approach has the potential for success, and can be instrumental in reducing the impact of the Jones Act on the State's economy.

**THE JONES ACT AND ITS IMPACT
ON THE STATE OF ALASKA**

VOLUME II: FINAL REPORT

Prepared for the

ALASKA STATEHOOD COMMISSION

by

SIMAT, HELLIESEN & EICHNER, INC.



July 1982

TABLE OF CONTENTS

1.	INTRODUCTION.....	1
2.	ANALYSIS OF THE JONES ACT	
2.1	<u>The Jones Act refers specifically to Section 27 of the Merchant Marine Act of 1920 and generally to all coastwise laws</u>	2
2.2	<u>The Merchant Marine Act of 1920 was established to insure a strong U.S.-flag merchant marine in reaction to the U.S. experience in World War I</u>	3
2.3	<u>The application of the Jones Act to Alaska has been subject to a variety of changes and exceptions</u>	4
2.4	<u>To understand these exceptions to Section 27, it is necessary to trace the history of the passage and subsequent amendments to the Merchant Marine Act of 1920</u>	4
2.5	<u>The Jones Act is not applied uniformly to all U.S. non-contiguous states and territories</u>	10
2.6	<u>Various proposed legislation and policy changes may affect the coastwise trading laws and maritime promotion laws</u>	11
3.	ANALYSIS OF THE JONES ACT FLEET	
3.1	<u>The Jones Act fleet is that portion of the U.S.-flag merchant fleet that is U.S.-built and does not receive subsidy</u>	15
3.2	<u>Jones Act vessels constitute 56.7% of the U.S. privately owned fleet</u>	15
3.3	<u>Ninety-four Jones Act vessels participated in the Alaska trade from December 1982 - January 1982</u>	15
3.4	<u>The Alaska trade fleet accounts for 28.8% of the Jones Act fleet</u>	17
4.	ANALYSIS OF ALASKA TRADE	
4.1	<u>There are three data bases available for determining cargo flow patterns to and from Alaska</u>	20
4.2	<u>Alaska's interstate trade accounts for 47.5% of Alaska's waterborne activity when Valdez crude oil is excluded</u>	20
4.3	<u>Alaska's domestic trade moves primarily among Alaska ports, and between Alaska ports and the Pacific Northwest and California</u>	23

TABLE OF CONTENTS (continued)

5.	U.S.-FLAG VS. FOREIGN-FLAG OPERATING COSTS	
5.1	<u>The methodology used in this analysis compared U.S.-flag and foreign-flag costs on existing service routes</u>	34
5.2	<u>There are a variety of technical factors and overlapping market sectors that make the maritime transportation industry complex and difficult to comprehend</u>	36
5.3	<u>In the Alaska coastwise trade there are essentially four types of service</u>	38
5.4	<u>U.S.-flag operators bear many cost disadvantages when compared to foreign-flag operators</u>	39
5.5	<u>The difference in U.S.-flag and foreign-flag vessel operating costs on key Alaska coastwise trade routes varies depending upon specific circumstances</u>	40
6.	IMPACT OF SHIPPING COSTS	
6.1	<u>There are many open questions concerning proposed removal of the coastwise laws which would have an impact on the savings actually realized</u>	51
6.2	<u>A scenario assuming the repeal of the Merchant Marine Act of 1920 must be realistic</u>	52
6.3	<u>For liner shipping services, Alaskan commerce is supporting a cost premium equivalent to about \$100 per capita per year</u>	53
6.4	<u>Alaska crude oil shipped south from Valdez is absorbing a \$255 million per U.S.-flag cost premium</u>	54
6.5	<u>Alaskans are paying a U.S.-flag cost premium of \$5.46 per long ton on petroleum products shipped north from Los Angeles</u>	54
6.6	<u>Alaskan wood products are absorbing a U.S.-flag cost premium of \$3.41 for southbound movements</u>	54
7.	REMARKS AND CONCLUSIONS	55
APPENDIX A	- Section 27 of the Merchant Marine Act of 1920	
APPENDIX B	- Results of RFR Computer Runs	
APPENDIX C	- Bibliography	

LIST OF TABLES AND FIGURES

TABLE 2A:	Cargoes Moving Via Canadian Ports in 1976.....	9
TABLE 3A:	Proportion of Jones Act Vessels to Total U.S.- flag, Privately-Owned, Self-Propelled Vessels of 1,000 Gross Tons or More - January 1, 1982	16
TABLE 3B:	List of Coastwise Vessel Callings on Alaska - December 1981 - January 1982	18
TABLE 3C:	U.S.-flag, Privately-Owned, Self-Propelled Vessels of 1,000 Gross Tons or More - January 1, 1982	19
TABLE 4A:	Corps of Engineers Top Ten Alaska Ports, 1979	21
FIGURE 4A:	Cargo Activity of Corps of Engineers Top 10 Alaska Ports	22
TABLE 4B:	Coastwise Cargo Shipments From Alaska To Other Points in the U.S., Including Alaska	24
TABLE 4C:	Coastwise Cargo Shipments From Alaska From Other Points in the U.S., Including Alaska	25
FIGURE 4B:	Coastwise Trade Shipped From Alaska in Short Tons	26
FIGURE 4C:	Coastwise Trade Shipped to Alaska in Short Tons	27
TABLE 4D:	1979 Alaska Coastwise Trade Receiving Ports.....	28
TABLE 4E:	1979 Alaska Coastwise Trade Shipping Ports	31
TABLE 5A:	Summary of U.S.- and Foreign-flag Costs for Containership Operations - Anchorage/Seattle	42
TABLE 5B:	Summary of U.S.- and Foreign-flag Costs for Ro/Ro Ship Operations - Anchorage/Seattle	43
TABLE 5C:	Summary of U.S.- and Foreign-flag Costs for Ro/Ro Ship Operations - Seattle/Whittier	44
TABLE 5D:	Summary of U.S.- and Foreign-flag Costs for VLCC Operations - Valdez/Los Angeles	46
TABLE 5E:	Summary of U.S.- and Foreign-flag Costs for VLCC Operations - Valdez/Panama	47
TABLE 5F:	Summary of U.S.- and Foreign-flag Costs for Handy-size Tanker Operations - Panama/Gulf	48
TABLE 5G:	Summary of U.S.- and Foreign-flag Costs for Product Tanker Operations - Los Angeles/Anchorage....	49
TABLE 5H:	Summary of U.S.- and Foreign-flag Costs for Bulk Carrier Operations - Ketchikan/Seattle	50

1. INTRODUCTION

This report was prepared in accordance with a professional services contract dated March 15, 1982 between Simat, Helliesen & Eichner, Inc. (SH&E) and the Alaska Statehood Commission.

The purpose of the study is to provide "an expert and objective analysis of the economic effects of the Merchant Marine Act of 1920 (The Jones Act) on the economy of Alaska."

The Commission specifically requested that the study consider the following issues:

A. The costs which the Act adds to the ultimate price of important classes of freight coming to and leaving Alaska, including crude and refined oil products, timber, building materials, fish products, ore, consumer items, and food. Contractor will prepare a freight rate model for comparable foreign vessels on similar routes.

B. The aggregate effect which higher Alaska consumer prices caused by the Jones Act have on the costs and standards of living in urban and rural Alaska.

C. The effects the Jones Act has upon further development and expansion of shipping-dependent industries, including mining, timber, and fishing.

D. The composition of the U.S.-flag Jones Act fleet, and report on what percentage of its total annual business is attributable to the Alaska trade.

E. The effects higher shipping costs due to the Jones Act have on state revenues derived from or dependent upon the extraction of natural resources.

F. Other important effects the Jones Act may have upon Alaska's economy, resources, and future development.

G. In a conclusion, contractor will summarize its findings on the annual costs (direct and indirect), disincentives, and advantages of the Jones Act to the State of Alaska and to the average Alaskan resident.

The study addresses the seven major issues in six tasks as follows:

- 1. Analysis of the Jones Act;**
- 2. Analysis of the Jones Act fleet;**
- 3. Analysis of Alaska trade;**
- 4. U.S. versus foreign vessel operating costs;**
- 5. Impact of shipping costs; and**
- 6. Conclusions.**

2. ANALYSIS OF THE JONES ACT

The purpose of this chapter is to identify and describe the Jones Act and other relevant cabotage legislation as it affects the State of Alaska.

2.1 The Jones Act refers specifically to Section 27 of the Merchant Marine Act of 1920 and generally to all coastwise laws.

The term "Jones Act" is understood to refer generally to the Merchant Marine Act of 1920 and specifically to Section 27 of that Act. Section 27 addresses the registry, country of construction and ownership of vessels carrying cargoes between points in the U.S. and between points in the U.S. and U.S. territories and possessions. A copy of Section 27 of the Merchant Marine Act of 1920, in its entirety, is provided as Appendix A.

Basically, Section 27 states:

No merchandise shall be transported by water, or by land and water,.....between points in the U.S....either directly or via a foreign port or for any part of the transportation, in any other vessel than a vessel built in and documented under the laws of the U.S. and owned by persons who are citizens of the U.S...

Because Section 27 restricts U.S. domestic waterborne trade to vessels of U.S. construction, U.S. registration, and U.S. ownership, the Jones Act has come to be referred to as the U.S. cabotage law. Cabotage refers to the reservation of a nation's domestic cargo to ships of that nation's fleet. It could be described as a form of protectionism applied to transportation services. The word "cabotage" is of uncertain origins but apparently stems from the spanish word cabo (cape or promontary) and is thought to have originally meant the navigation between two capes.

Section 27 coins its own term for laws that apply the principles of cabotage by referring to them as coastwise laws. This term appears often in various ruling and litigation concerning U.S. cabotage and it stands as a reminder that restrictions and exemptions on the use of foreign registered, foreign built, and foreign owned vessels in the U.S. trade are treated in a variety of rulings and laws other than those embodied solely in Section 27. As a matter of practice, those who refer loosely to the Jones Act in the contexts of the totality of U.S. cabotage laws are probably referring generally to the so-called coastwise laws and not specifically to Section 27 of the Merchant Marine Act of 1920. It is important to note that, in some maritime circles, the Jones Act refers to that portion of the Merchant Marine Act of 1920 covering personal injury of seamen.

There are exceptions to the basic prohibitions contained in Section 27 and some of these apply specifically to Alaska. These exceptions will be addressed in detail. It is also important to remember that coastwise laws treat three distinct issues:

1. Country of Construction (must be built in the U.S.);
2. Country of Registry (must be documented under laws of the U.S.)
3. Citizenship of Owners (must be citizens of the U.S.)

2.2 The Merchant Marine Act of 1920 was established to insure a strong U.S.-flag merchant marine in reaction to the U.S. experience in World War I.

The purpose of the Merchant Marine Act of 1920 is stated clearly in the preamble of the Act:

That it is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned and operated privately by citizens of the United States....

To understand why the Merchant Marine Act of 1920 was enacted it is first necessary to review the history of cabotage in the U.S. and more specifically to study the U.S. experience in World War I.

Cabotage is not a recent development on the American scene. Some of the first official acts of the new American republic were to establish tonnage duties which in effect discriminated against foreign-built, foreign-owned ships. The purpose then, as now, was no doubt to protect and nourish a U.S.-flag merchant marine to serve the country in time of national emergency.

In 1817, the duty system was replaced by a prohibition on the movement of goods between U.S. ports in foreign vessels. In effect, the act of March 1, 1827 was the nation's first true cabotage law.

Although the original cabotage laws applied only to the continental U.S., as the nation expanded and gained territorial possessions, the principle of cabotage was extended to U.S. possessions and territories. Soon after the purchase of Alaska, Congress decreed that trade with the new territory should fall under the cabotage law. (Act of July 27, 1868, Sec. 5, 15 Stat. 241.)

The cabotage laws were suspended briefly during World War I for all areas except Alaska. The suspension was limited to the duration of the war plus 120 days. The Merchant Marine Act of 1920 (the Jones Act) restored the cabotage laws.

The restoration of the cabotage laws was made inevitable by the catastrophic experience of World War I. At the beginning of World War I in 1914, the British maintained the world's largest merchant fleet with over 8,500 vessels

equalling 35% of the world fleet. The initial protagonists in World War I (Germany, Austria, and Italy of the triple Alliance and Britain, France and Russia of the triple Entente), together with Japan and Turkey, accounted for over 14,000 vessels or nearly 60% of the world fleet and over 65% of the world's tonnage.

As the warring nations recalled their merchant fleets to military service or lost them in action on the high seas, the U.S. began to experience a crippling scarcity of vessels for its on-going commerce. Commodities and goods were left literally rotting on the piers.

The initial U.S. response to the WWI shipping crisis was to pass the Shipping Act of 1916, which set up the U.S. Shipping Board and the Emergency Fleet Corporation. The Emergency Fleet Corporation undertook a major shipbuilding program to provide the country with the ships necessary to carry men and materials to Europe for an extended war. However, only a few vessels were delivered before the armistice ending WWI was declared in November of 1918.

The experience of WWI indicated to U.S. lawmakers the dangers of relying on foreign-flag fleets. There was a feeling that the lack of merchant vessels had damaged U.S. commerce in the years before the U.S. entered WWI, and had displaced valuable resources by engendering a wasteful and ultimately unnecessary shipbuilding program. By 1921, the U.S. fleet numbered over 4,200 vessels - up from the 1,600 that were available at the beginning of the war in 1914.

In the summer of 1919, the Senate Commerce Committee chaired by Wesley L. Jones, Republican from the State of Washington (1909 to 1932), began working on a revision of the national maritime laws. Under Jones' direction the Merchant Marine Act of 1920 was passed into law. The Act is described as providing for:

The promotion and maintenance of the American merchant marine, to repeal certain emergency legislation, and provide for the disposition, regulation and use of property acquired there under, and for other purposes.

2.3 The application of the Jones Act to Alaska has been subject to a variety of changes and exceptions.

The basic Section 27 prohibition against the use of foreign-built, owned, and registered ships in U.S. coastwise trades is mitigated for the State of Alaska by two exceptions described as the third and fourth provisos of Section 27.

The so-called third proviso states:

...Provided further, that this section shall not apply to merchandise transported between points within the continental United States, including Alaska, over through routes heretofore or hereafter recognized by the Interstate Commerce Commission for which routes rate tariffs have been or shall hereafter be filed with said Commission when such routes are in part over Canadian rail lines and their own or other connecting water facilities...

The fourth proviso states:

...provided further, That this section shall not become effective upon the Yukon River until the Alaska Railroad shall be completed and the Shipping Board shall find that proper facilities will be furnished for transportation by persons citizens of the United States for properly handling the traffic...

In addition, with respect to Hyder, Alaska, Public Law 87-77, 75 Stat. 196, states:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, notwithstanding the provisions of law of the United States restricting to vessels of the United States the transportation of passengers and merchandise directly or indirectly from any port in the United States to another port of the United States, passengers may be transported on Canadian vessels between ports in southeastern Alaska, and passengers and merchandise may be transported on Canadian vessels between Hyder, Alaska, and other points in southeastern Alaska, and between Hyder, Alaska, and other points in the United States outside Alaska, either directly or via a foreign port, or for any part of the transportation until the Secretary of Commerce determines that United States-flag service is available to provide such transportation.

- 2.4 To understand these exceptions to Section 27, it is necessary to trace the history of the passage and subsequent amendments to the Merchant Marine Act of 1920.

The original wording of the so-called third proviso excluded Alaska from the exception with the wording "...provided further, that this section shall not apply to merchandise transportation between points within the continental U.S., excluding Alaska over through routes ... recognized by the Interstate Commerce Commission." This exclusion of Alaska had the effect of closing Canadian ports for the movement of cargoes between Alaska and the lower 48 states. There is speculation that the exclusion of Alaska was included by Jones to benefit commercial interests in the State of Washington.

The territorial legislature of Alaska contested the wording of the original third proviso which excluded Alaska from the exception. (The exception would have allowed cargoes to move between Alaska and the lower 48 states through Canadian ports.) A law suit filed on behalf of the territory contending that the exclusion was unconstitutional was denied by the U.S. Supreme Court saying that there were intended differences in the administration of states vs. territories. Through the period of the early 1920's complaints were registered and bills were introduced to change the Section 27, but none were successful.

During WWII, the Second War Powers Act of 1942 granted the Secretary of the Treasury the right to waive navigation laws. As a result, Canadian vessels were allowed to carry coastwise cargo between Alaska and the 48 states. The War Powers Act expired in 1947.

In 1958, with the passage of the Statehood Act, the third proviso of the Merchant Marine Act of 1920 was changed. The words "excluding Alaska" were replaced with the words "including Alaska." The latter is the wording of the current version of the third proviso. For practical purposes, it allows the use of foreign owned, registered and built ships for carrying cargoes between Alaska and the lower 48 states via Canadian ports.

Both the third and fourth provisos of the Merchant Marine Act of 1920 have been subject to interpretation. The agency with jurisdiction over the coastwise laws is the Customs Service of the U.S. Department of the Treasury, Division of Carriers Drawback and Bonds.

The following are examples of operations that have been planned in the past and the Customs Service's opinion on those proposals.

Proposals Concerning the Third Proviso

Question

Can a foreign-flag vessel carrying chemicals from Alaska unload part of its cargo in Vancouver and part in Los Angeles? Is the situation changed if all of the cargo is unloaded in Vancouver and then part of it is reloaded for Los Angeles?

Answer

No, in both situations.

Question

Can a trailer load of frozen fish from Alaska be offloaded at Prince Rupert, carried by Canadian ferry to Vancouver and then moved by motor carrier to the State of Washington?

Answer

No, the situation is in violation. No rail carriage is involved.

Question

Can cargoes from the lower 48 move north to Canada via highway and then by Canadian Rail to Edmonton, then by truck to Hay River and then to the Arctic Coast?

Answer

Yes. This route goes by Canadian rail and is on a tariff filed with the ICC. The connecting water facility cited in the third proviso need not connect directly with Canadian rail.

Question

Can Alaska oil be transported to Panama via a U.S.-flag vessel, stored in a foreign-flag vessel and then reloaded on a U.S.-flag vessel?

Answer

Yes. The foreign-flag vessel is not used for transport.

Question

Can a foreign-flag vessel carry railcars and truck trailers received from Canadian railroads between Canadian ports and Alaska?

Answer

Yes, providing they are on routes "recognized by the Interstate Commerce Commission" and tariffs have been filed.

Proposals Concerning The Fourth Proviso

Question

River? Does the reference to the Yukon River include its tributary, the Tanana

Answer

Yes. .

The Department of Treasury's rulings on provisos three and four of Section 27 were summoned succinctly in a letter to Mr. John Leeper in March of 1977.

....We have held that through routes are, within the meaning of the third proviso, 'recognized by the Interstate Commerce Commission' when rate tariffs for them have been filed with the Commission, have not subsequently been rejected for filing, have become effective according to their terms, and have not been subsequently suspended by the Commission or superseded or withdrawn.

1

We have held that over Canadian rail lines means simply over rail trackage in Canada and that their own or other connecting water facilities means water facilities, whether or not connecting with trackage in Canada. These holdings were made with explicit reference to the through route participated in by the Alaska Trainship Corporation...We are aware of one other such tariff involving Ward Cove, Alaska, and of several involving Vessels of the Northland Transportation Company moving from Hay River, N.W.T., to the North Slope.

With regard to the fourth proviso, the Alaska Railroad is deemed to have been completed within the meaning of the statute, but the Secretary of Commerce has not made the finding which would make the proviso inoperative. We have held that this proviso makes the coastwise laws not effective on the Yukon only with respect to the transportation of merchandise.

....any foreign-flag operator may provide the connecting water facilities on a through route in compliance with the third proviso, provided it is named in the tariffs filed.

The most effective use of the third proviso exception was the service provided by the Alaska Trainship Corporation, a Crowley Maritime Corporation subsidiary. The Alaska Trainship Corp. operated a Liberian flag rail ferry vessel, the M.S. Alaska. It had a capacity for 64 rail cars. Cargoes were transported between Seattle and New Westminster, B.C. by the Burlington Northern Railroad over Canadian trackage. In Canada, the rail cars were loaded aboard the vessel. Cargoes departed Seattle on Thursday evenings and arrived at Whittier the following Sunday where they were rolled off the ferry onto the Alaska railroad for delivery in Anchorage on Monday and Fairbanks on Tuesday. The water transit time was two days and 22 hours.

In 1976, 99,893 short tons of cargo moved out of the Port of New Westminster, B.C. for Whittier, Alaska, or less than .5% of the total Alaska coastwise trade. Table 2A shows the cargoes that moved via British Columbia ports in 1976.

While the Merchant Marine Act of 1920 represents the most explicit of the coastwise trading laws, there are other laws, including the Merchant Marine Act of 1936, that serve to restrict the use of foreign-flag ships, or reserve cargoes specifically for U.S.-flag vessels.

The two most current examples involve conflicts with the Merchant Marine Act of 1936. The first involves waivers to the Act to allow U.S.-flag tankers built with construction subsidy to participate in the Alaska coastwise oil trade. In 1980, seven subsidized U.S.-flag vessels received permission to enter the Alaska trade for up to six months of any 12 month period. Operators of those vessels were required to pay back a pro rata share of the construction subsidy based on the amount of time spent in the Alaska trade. The second issue involves

TABLE 2A
CARGOES MOVING VIA CANADIAN PORTS IN 1976

WHITTIER TO NEW WESTMINSTER, B.C.

COMMODITY	SHORT TONS
911 Fresh Fish	3,419
912 Shellfish	38
2031 Fish, Fish Products	143
3411 Fabricated Metals	35
3511 Machinery	389
4011 Iron and Steel Scrap	1,096
4112 Miscellaneous Shipments	2
TOTAL	5,122

NEW WESTMINSTER, B.C. TO WHITTIER

COMMODITY	SHORT TONS
191 Miscellaneous Farm Prod	15
911 Fresh Fish	126
1494 Gypsum, Crude and Plaster	2,272
1499 Nonmetallic Minerals	170
2042 Prepared Animal Feeds	4,374
2094 Groceries	20,744
2421 Lumber	20,707
2431 Veneer, Plywood	457
2491 Wood Manufactures	1,529
2621 Standard Newsprint Paper	3,182
2631 Paper and Paperboard	184
2810 Sodium Hydroxide	240
2819 Basic Chemicals	2,970
2891 Miscellaneous Chemicals	3,690
2916 Lubricating Oils	99
2918 Asphalt, Tar, Pitches	2,014
2931 Asphalt Building Mat.	48
3211 Glass	143
3241 Building Cement	12,938
3251 Structural Clay Product	26
3291 Miscellaneous Nonmetallic	2,596
3317 Iron and Steel Pipes	3,324
3411 Fabricated Metals	3,985
3511 Machinery	946
3611 Electrical Machinery	62
3731 Ships and Boats	6
4112 Miscellaneous Shipments	7,226
TOTAL	99,893

Source: Simat, Helliesen & Eichner, Inc.

American President Lines' (APL's) bid to amend Sections 506 and 605a of the 1936 Merchant Marine Act to allow subsidized carriers to operate in the domestic western Alaska trade. Neither of these issues specifically involve the Merchant Marine Act of 1920.

Public Law 83-664 requires that at least 50% of all government generated cargo be shipped on privately owned U.S.-flag commercial vessels if such vessels are available at fair and reasonable rates. PL83-664 covers oil being transported into the U.S. for the Strategic Petroleum Reserve.

The Military Transportation Act of 1904 requires that all supplies for the U.S. Armed Services be carried on vessels of U.S. registry or vessels owned by the U.S. With some exceptions, the Military Sealift Command uses U.S.-flag commercial liner service, dedicated charter vessels and its so-called "nucleus fleet" in serving the needs of the U.S. Armed Forces.

The Intercoastal Shipping Act of 1933 requires the filing of tariffs with the Federal Maritime Commission and sets the procedure for regulating rate increases in the domestic non-contiguous trade.

2.5 The Jones Act is not applied uniformly to all U.S. non-contiguous states and territories.

A variety of circumstances and conditions have resulted in differing exceptions to the Jones Act for some territories and states. The third and fourth proviso exceptions to Section 27 of the Merchant Marine Act of 1920 are examples of exceptions that apply to Alaska.

There are other exceptions. For instance, trade with the U.S. island possessions of Guam, Tutuila (American Samoa), Wake, Midway and Kingman Reef may be carried on foreign built U.S.-flag vessels in accordance with 46 USC11.

Of greater interest to Alaska, however, are the circumstances and conditions that govern trade to the Virgin Islands. When the Virgin Islands were first purchased from Denmark, most of its trade was handled by foreign-flag vessels. U.S.-flag carriers did not operate in the Virgin Islands trade with any regularity at the time of the purchase. In providing for the transition, the Virgin Islands were exempted from the Merchant Marine Act of 1920 when Section 21 of that Act extended the jurisdiction of the coastwise laws to the island territories and possessions of the United States. The exemption provided under Section 21 required the President to issue a proclamation yearly to extend the exemption. In 1936 the method of handling the exemption was changed. The Merchant Marine Act of 1936 provided that:

...the coastwise laws of the United States shall not extend to the Virgin Islands of the United States, until the President of the United States shall, by proclamation, declare that such coastwise laws shall extend to the Virgin Islands and fix a date for the going into effect of same.

Since the enactment of the Merchant Marine Act of 1936, there has been no executive action to extend the coastwise laws to the Virgin Islands. As a result, cargoes move between the Virgin Islands and U.S. mainland on foreign-owned ships. The exemption has been used extensively for moving petroleum products.

Because the Jones Act does not apply, Alaska crude oil can be shipped out of Alaska on foreign-flag vessels to a refinery in the Virgin Islands. The product can then be shipped foreign-flag to the U.S. mainland. According to an article in the June 1982 edition of American Shipper, foreign-flag vessels are used exclusively on the Alaska/Virgin Islands leg and a combination of U.S.- and foreign-flag vessels are used on the Virgin Islands/U.S. mainland leg. Data compiled by the Maritime Administration indicates that this route accounts for about 5% to 15% of Alaska oil shipments on a month-to-month basis.

2.6 Various proposed legislation and policy changes may affect the coastwise trading laws and maritime promotion laws.

The Reagan Administration's proposed maritime policy initiatives, as contained in an interdepartmental memo dated 5/3/82 ^{1/}, consisted of a number of steps that affect coastwise laws either directly or indirectly.

Each of the relevant policy proposals is summarized below, with SH&E's comments.

Proposal

Presidential Statement Reaffirming Existing Cargo Preference Law. The President would issue a statement reaffirming the existing laws that mandate partial U.S.-flag carriage of government-impelled cargoes.

Comment

This proposal says nothing and changes nothing. It does indicate that the administration is committed to cargo preference and, by inference, the maintenance of the coastwise cabotage laws.

Proposal

Economic Deregulation of Cabotage Trades. The Federal Maritime Commission (FMC) has published a proposed ruling which would eliminate rate regulation for operators in the cabotage trades (domestic trades covered by the Jones Act). We [the Administration] should file in support of this ruling as a further step in deregulation of ocean shipping. Staff has begun to draft a filing.

^{1/} Memo appeared in July 1982 American Shipper.

Comment

From a practical point of view, deregulation of the non-contiguous trades will effect Alaska very little because most of the state's lower 48 cargoes are shipped on the basis of ICC tariffs. In our judgement, continued deregulation of the Alaska trade is probably in the state's best interest, as the trade with the lower 48 states appears to be competitive for the most part. This situation does not apply to some other non-contiguous states and territories where competition is limited, such as Guam.

Proposal

Extension of Foreign Build for ODS ^{1/} Fleet. It is proposed that the temporary authority established in the fall of 1981 for ODS operators to construct vessels outside the U.S. and still receive ODS for those vessels be extended. This would allow ODS operators, without CDS^{2/}, to replace their existing fleets.

Comment

This has no direct impact on the Alaska trade. However, if the administration is going to make permanent policy of allowing foreign-built ships to be used in the subsidized U.S.-flag fleet, it is an admission that the Administration is no longer willing to pay construction subsidy for higher cost U.S.-built vessels. The State of Alaska can logically ask why the domestic trades, which by law must be served by higher cost, U.S.-built ships which are not benefited by any U.S. subsidy, must then subsidize U.S. shipyards when the Federal Government itself is unwilling to make the subsidy on behalf of the country at large. This administration proposal would require legislative action.

Proposal

Allow Reflagged Vessels Immediate Eligibility to Carry Government-Impelled Cargoes. A required corollary to the above is to remove the present requirement that foreign-built or rebuilt vessels must be documented under the laws of the United States for three years before they can carry government-impelled cargoes under the provisions of PL664.

Comment

This is a further relaxation of the U.S. tradition of requiring the merchant fleet to be built in domestic yards. It adds still more logic to an argument to extend this relaxation to the domestic trades. This administration proposal requires legislation.

^{1/} Operating Differential Subsidy.

^{2/} Construction Differential Subsidy.

Proposal

Foreign Investment in U.S.-Flag Shipping. Increasing the allowed percentage of foreign ownership in U.S.-flag ships from 49% to 75% would attract needed capital to the industry. The proposal calls for U.S. citizen control of management and the board of directors.

Comment

No direct impact on Alaska although it might facilitate an infusion of foreign capital into Alaska's marine infrastructure. This administration proposal will require legislation.

Proposal

Extend the Capital Construction Fund (CCF) to Inland Waterway, Coastwise and Intercoastal Operators. The tax deferral privileges of the CCF would be extended to all operators in domestic commerce in order to facilitate the replacement of their fleets.

Comment

This would allow Alaska trade carriers to defer income tax on earnings set aside for new vessel construction. This would reduce costs in the Alaska trade and encourage replacement of equipment so it would be in the state's best interest. This administration proposal would require legislation.

Proposal

Allow U.S.-Controlled Foreign Corporations to Use U.S.-Flag Vessels Without Tax Penalty. U.S.-controlled flag-of-convenience operators would be allowed to operate U.S.-flag vessels under lease without tax penalty in the same manner they operate foreign-flag vessels. These leases would be entitled to the tax advantages of the 1981 Tax Act.

Comment

It is not clear what impact this would have on the Alaska trade, if any. Presumably, any action that enhances the attractiveness of U.S.-built vessels will ultimately bring the cost of U.S. vessels down relative to foreign-built vessels. This administration proposal requires legislation.

Proposal

Longshoremen's and Harbor Workers Compensation Act. Changes in this act would reduce the cost of building ships in the United States. (Shipyard workers are covered by the act.) Under this proposal, DOT would join with the Department of Labor in endorsing needed changes through the vehicle of legislation now under consideration on the Hill.

Comment

Any action that will reduce the cost of U.S.-built ships is in the best interest of the state.

Deferred Proposal

Extend the Jones Act to the U.S. Virgin Islands Petroleum Trades. This proposal would result in U.S.-flag carriage of Alaskan crude oil now going in foreign vessels from Alaska to the Virgin Islands and complete U.S. carriage of petroleum products now carried partly by foreign vessels from the Virgin Islands to the mainland. It would provide employment opportunity for 9-15 U.S.-flag vessels, but it would cost the oil company involved an estimated \$20 million annually.

Comment

The key concern for the State of Alaska, other than the issue of oil revenues, is the pressure on the administration not only to maintain the Jones Act but increase its scope. Note that it is suggested in the proposal that the repeal of the Jones Act exception for the Virgin Islands would provide employment for 9-15 U.S.-flag vessels. This proposal conflicts with the Administration's Caribbean basin policy, so extension of the Jones Act to the Virgin Islands appears unlikely. Note that this proposal was "deferred" by the Administration.

3. ANALYSIS OF THE JONES ACT FLEET

The purpose of the chapter is to identify the so-called Jones Act fleet and determine what percentage of that fleet is engaged in the Alaska trade.

3.1 The Jones Act fleet is that portion of the U.S.-flag merchant fleet that is U.S.-built and does not receive subsidy.

In identifying the Jones Act fleet, it is first necessary to define the terms. For purposes of this analysis, the total U.S. merchant fleet is determined to be all U.S.-flag, privately owned, self-propelled vessels of 1,000 gross tons or more. This is a commonly accepted definition and is appropriate for this analysis. It does exclude certain tugs and barges that serve the Alaska trade.

The Jones Act fleet consists of those vessels that are eligible to engage in the coastwise trade. Generally, that includes any vessels built in the U.S., under U.S. ownership, registered under the laws of the U.S., and not restricted because of subsidy status. Vessels that have received Construction Differential Subsidy (CDS) or are receiving Operating Differential Subsidy (ODS) from the Maritime Administration cannot serve the cabotage or coastwise trade without special waivers — they are generally limited to international trades.

Because the content of the U.S. fleet and the Jones Act fleet varies over time, the analysis was done on the status of the fleet on January 1, 1982.

3.2 Jones Act vessels constitute 56.7% of the U.S. privately owned fleet.

As shown in Table 3A, the total U.S. privately owned fleet consists of 575 self-propelled merchant vessels over 1,000 gross tons. Of this number, 280 are classified as dry cargo freighters, the remaining 295 are tankers. Of this total, 326 or 56.7% of the fleet are classified as Jones Act vessels.

Table 3A also compares the fleets in terms of their deadweight tonnage (DWT). DWT reflects the fleet's carrying capacity in tons. This analysis shows that the Jones Act fleet constitutes 60.7% of the carrying capacity of the nation's active privately owned fleet.

3.3 Ninety-four Jones Act vessels participated in the Alaska trade from December 1981 - January 1982.

In order to get an accurate count of vessels plying the Alaska trade, an accounting was made of all vessels that called at Alaska during the months of December 1981 and January 1982. This allowed enough time for vessels engaged in the trade to complete voyages and therefore be included in the total.

TABLE 3A

**PROPORTION OF JONES ACT VESSELS TO TOTAL U.S.-FLAG
PRIVATELY-OWNED SELF-PROPELLED VESSELS
OF 1,000 GROSS TONS OR MORE
JANUARY 1, 1982**

		Number of Vessels			DWT (000)		
		<u>Jones Act</u>	<u>Total</u>	<u>%</u>	<u>Jones Act</u>	<u>Total</u>	<u>%</u>
A. DRY CARGO							
01	Freighter	7	54	13.0	77.1	669.2	11.5
04	Bulk Carrier	9	13	69.2	222.8	329.7	67.6
05	Combo Passenger	3	3	100.0	20.0	20.0	100.0
06	Combo Refrig	-	4	0.0	-	37.4	0.0
09	Container	33	102	32.4	485.7	1,976.8	24.6
24	Collier	1	1	100.0	24.3	24.3	100.0
53	Container/Barge	-	18	0.0	-	682.3	-
54	Container/Car	2	2	100.0	36.1	36.1	100.0
58	Partial Container	-	54	0.0	-	768.9	0.0
59	Roll-On/Roll-Off	11	23	47.8	164.3		50.4
73	Bulk/Oil	1	1	100.0	15.2	15.2	100.0
78	Ore/Bulk/Oil	-	2	0.0	-	164.4	0.0
87	Tug/Barge-Bulk	3	3	100.0	73.5	73.5	100.0
	Total	70	280	25.0	1,119.0	5,123.7	21.8
B. TANKERS							
02	Tankers	229	257	89.1	11,012.2	14,777.3	74.5
22	LPG Tanker	3	3	100.0	84.4	84.4	100.0
26	Tug/Barge-Tank	6	9	66.7	186.9	309.9	60.3
30	Asphalt Tanker	2	2	100.0	31.4	31.4	100.0
33	Chemical Tanker	6	6	100.0	164.8	164.8	100.0
34	LNG Tanker	5	13	38.5	357.3	928.1	38.5
38	Sulphur Tanker	5	5	100.0	113.3	113.3	100.0
	Total	256	295	86.8	11,950.3	16,409.2	72.8
C. TOTAL		326	575	56.7	13,069.3	21,532.9	60.7

Source: U.S. Maritime Administration.

Table 3B lists all vessels calling at Alaska by name in five categories:

- Tankers calling at Valdez
- Tankers calling at other Alaskan ports
- Containerships (vessels carrying standardized containers)
- Ro/Ro vessels (vessels carrying trailers and other wheeled cargo)
- Tankers transiting Panama Canal with Alaska oil

3.4 The Alaska trade fleet accounts for 28.8% of the Jones Act fleet.

The Alaska trade fleet of six ^{1/} dry cargo freighters and 88 tankers constitutes 28.8 percent of the Jones Act fleet. Table 3C shows the numbers of vessels and aggregate deadweight tonnage in both categories of vessels. Note that the Alaska trade fleet constitutes 16% of the active U.S.-flag privately owned fleet.

A comparison of Tables 3A and 3C shows that the dry cargo freighters in the Jones Act fleet are generally smaller and more specialized than the total fleet.

Among tankers, the Jones Act fleet constitutes 86.8% of the total U.S. fleet. Here again the Jones Act ships are smaller.

The Alaska trade dry bulk freighters constitute only 8.6% of the total Jones Act eligible freighters. The containerships are smaller than those generally found in the Jones Act fleet and the Ro/Ro ships are larger.

Among tankers, the Alaska trade fleet is made up of 34.4% of the total Jones Act fleet, but has 54% of the carrying capacity. This is because tankers in Alaska service are larger than the fleet average.

^{1/} Includes Sea-Land and TOTE; excludes barges services.

TABLE 3B

LIST OF COASTWISE VESSEL CALLINGS ON ALASKA December 1981 - January 1982

NAME	(000) DWT	NAME	(000) DWT	NAME	(000) DWT
<u>Tankers Calling at Valdez, Alaska</u>		<u>Tankers Calling at Other Alaska Ports</u>			
1. American Sun	88.7	1. Alaska Standard	2.7	15. Eastern Sun	38.2
2. American Independence	262.4*	2. Santa Paula	34.9	16. Golden Gate	62.1***
3. Arco Alaska	128.4	3. Sasinema II	70.5	17. Gulf King	34.7
4. Arco Anchorage	128.6	4. Cornucopia (LPG)	23.7	18. Gulf Prince	33.1
5. Arco California	128.6	5. Chevron Colorado	34.5	19. Gulf Queen	34.7
6. Arco Fairbanks	128.6	6. Chevron Mississippi	70.2	20. Mobil Fule	31.2
7. Arco Juneau	128.6	7. Sierra Madre	37.5	21. Mobile Power	31.0
8. Arco Sag River	70.4		274.0	22. Mobilgas	20.9
9. Day Ridge	225.0**			23. Mount Washington	49.3
10. HT Alaska	100.1	<u>Containerships Calling at Alaska Ports</u>		24. Ogden Challenger	33.3
11. HT San Diego	100.1	1. Aleutian Developer	2.3	25. Ogden Champion	37.9
12. Brooks Range	173.4	2. Newark	9.3	26. Ogden Leader	37.0
13. Chevron Arizona	34.5	3. Philadelphia	9.4	27. Ogden Wabnah	37.9
14. Chevron California	70.2	4. Portland	9.7	28. Ogden Willamette	37.9
15. Exxon Baton Rouge	75.6		30.7	29. Overseas Alaska	62.0
16. Exxon Bencala	172.8	<u>Roll-On/Roll-Off Vessels Calling at Alaska Ports</u>		30. Overseas Aleutian	39.0
17. Exxon Houston	67.9	1. Great Land	16.1	31. Overseas Anchorage	47.4
18. Exxon New Orleans	67.0	2. Westward Venture	17.9	32. Overseas Arctic	62.0
19. Exxon North Slope	173.4		34.0	33. Overseas Chicago	90.6***
20. Exxon Philadelphia	75.6	<u>Tankers Transiting Panama Canal With Alaskan Oil</u>		34. Overseas Joyce	46.9
21. Exxon San Francisco	75.6	1. Achilles	41.2	35. Overseas Natalie	67.2
22. Glacier Bay	81.0	2. American Eagle	33.1	36. Overseas New York	90.4
23. Golden Gate	62.1	3. Arco Heritage	50.0	37. Overseas Ohio	90.6***
24. Kenai	123.1	4. Arco Prudhoe Bay	70.4	38. Overseas Villa	35.7
25. Keystone Canyon	173.4	5. Arco Texas	70.2	39. Overseas Valdez	37.0
26. Manhattan	113.9	6. Baltimore Trader	57.9	40. Overseas Vivian	37.0
27. Maryland	264.1*	7. Chevron Arizona	34.5***	41. Overseas Washington	90.5***
28. Mobil Arctic	129.0	8. Chevron Louisiana	39.5	42. Pennsylvania Sun	50.9
29. Mobile Meridian	49.2	9. Colorado	30.4	43. Petersburg	50.1
30. Mobiloli	30.1	10. Connecticut	37.6	44. Philadelphia Sun	37.5
31. Overseas Boston	123.7	11. Cove Communicator	31.9	45. Texaco Florida	42.0
32. Overseas Chicago	90.6	12. Cove Leader	67.4	46. Texaco New York	42.9
33. Overseas Juneau	120.0	13. Cove Spirit	25.2	47. Texas Sun	50.9
34. Overseas Ohio	90.6	14. Dina	30.3	48. Washington Trader	41.0
35. Overseas Washington	90.5				2,252.3
36. Prince William Sound	123.4				
37. Sohio Interpid	20.6				
38. Sohio Resolute	80.8				
39. Thompson Pass	173.4				
40. Tonsina	122.9				
41. Williamsburg	225.1*				
	5,107.4				

* Vessel built with CDS.
** CDS repair.
*** Also calling at Valdez.

TABLE 3C

**U.S.-FLAG PRIVATELY OWNED SELF-PROPELLED VESSELS
OF 1,000 GROSS TONS OR MORE
January 1, 1982**

	Number of Vessels			DWT (000)		
	Serving Alaska	Total Jones Act	% Serving Alaska	Serving Alaska	Total Jones Act	% Serving Alaska
A. FREIGHTERS						
09 Containerships	4	33	12.1	30.7	485.7	6.3
59 Roll-On/Roll-Off	2	11	18.2	34.0	164.3	20.7
Other	-	26	-	-	469.0	-
Total	6	70	8.6	64.7	1,119.0	5.8
B. TANKERS						
02 Tankers	87	229	38.0	6,490.1	11,012.2	58.9
22 LPG Tankers	1	3	33.3	23.7	84.4	28.1
Other	-	24	-	-	853.7	-
Total	88	256	34.4	6,513.8	11,950.3	54.5
C. TOTAL JONES ACT FLEET	<u>94</u>	<u>326</u>	<u>28.3</u>	<u>6,578.5</u>	<u>13,069.3</u>	<u>50.3</u>

Note: Three large tankers built with CDS totalling 751,600 DWT also operated in the Alaskan trade in this period under permission granted by the Maritime Administration pursuant to 46 CFR 250.

Source: U.S. Maritime Administration.

4. ANALYSIS OF ALASKA TRADE

The purpose of this chapter is to identify relevant cargo flows in the Alaska trade and to characterize and define the Alaska coastwise trade.

4.1 There are three data bases available for determining cargo flow patterns to and from Alaska.

There are several data bases that can be referenced to identify key traffic flows in the Alaska trade. The most widely used is Waterborne Commerce of the U.S., published yearly by the U.S. Army Corps of Engineers. The most recent available published data from the Corps of Engineers is for 1979.^{1/}

In addition, the U.S. Department of Transportation, Maritime Administration publishes Domestic Waterborne Trade of the U.S. 1975-1979 which can be used to augment the Corps' data. Although these data provide unique comparisons, they are also taken from the Corps' Waterborne Commerce data base.

Other data are available including the Bureau of Census Import and Export series and the 1972 and 1977 Census of Transportation Surveys. However, these data were not considered relevant to a study of the Jones Act trade and were, therefore, not used.

Also useful for this study is an SH&E proprietary data base showing Alaska port-to-port commodity data for the year 1976. Although these data are somewhat out of date, no other port-to-port data are available, and this data base, therefore, gives a unique picture of waterborne cargo flow patterns within Alaska and between Alaska and the other 49 states and territories.

There are some minor inconsistencies among the various data bases.

4.2 Alaska's interstate trade accounts for 47.5% of Alaska's waterborne activity when Valdez crude oil is excluded.

The Corps of Engineers publishes detailed data for traffic moving into and out of 10 key Alaska ports. These data identify foreign exports as well as coastwise and intrastate (internal) movements. They are summarized in Table 4.1.

As might be expected, Alaska's waterborne commerce is dominated by crude oil shipments from Valdez. Valdez shipments accounted for 89.5% of Alaska's total port activity in 1979.

When Valdez crude oil shipments are subtracted from the total, a more useful distribution of cargo is provided. As shown in Figure 4A, Alaska's waterborne commerce (excluding Valdez crude oil shipments) is 34.5% foreign imports and exports, 47.5% coastwise receipts and shipments, and 18% internal receipts and shipments. The relationship of total foreign, coastwise, and internal

^{1/} The Corps of Engineers does have preliminary data for 1980. Final data for 1980 were not available for this study.

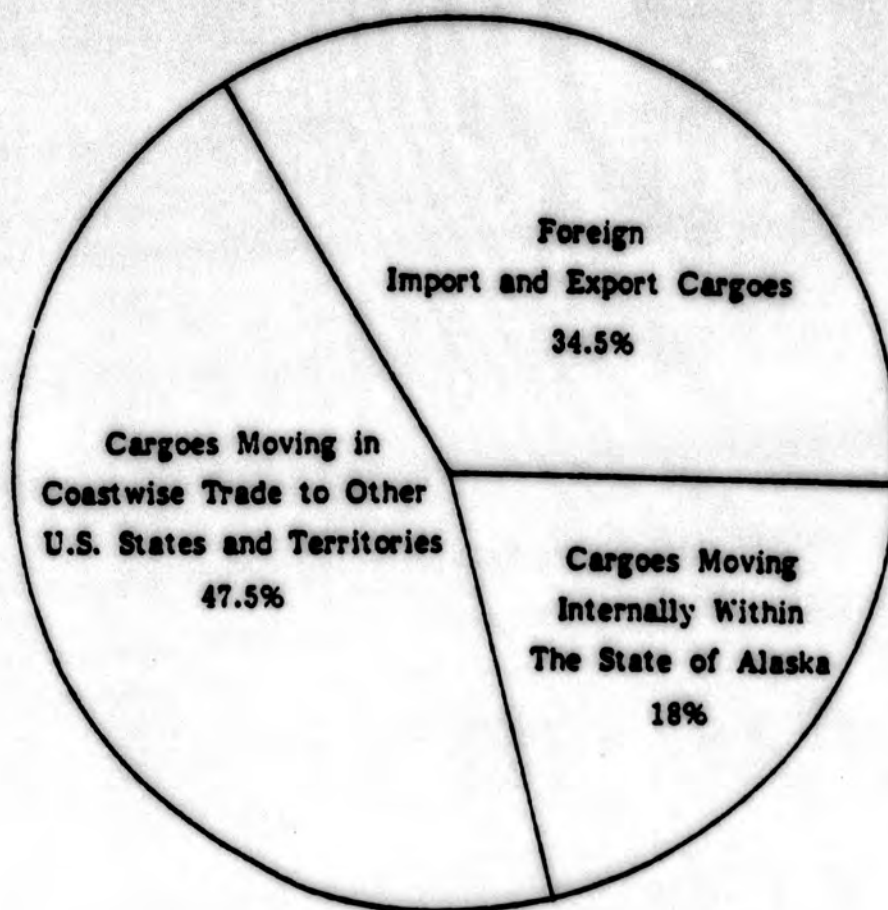
TABLE 4A
CORPS OF ENGINEERS TOP TEN ALASKA PORTS, 1979
(Short Tons of Cargo)

	<u>Foreign Import</u>	<u>Foreign Export</u>	<u>Coastwise Receipt</u>	<u>Coastwise Shipment</u>	<u>Internal Receipt</u>	<u>Internal Shipment</u>	<u>Local</u>
Metlakatla Harbor	1,909	165,983	3,367	5,026	176,096	69,775	—
Ketchikan Harbor	493,204	433,478	381,499	78,833	573,945	162,824	78,234
Wrangell Harbor	40	206,872	7,592	5,094	10,220	79,066	—
Wrangell Narrows	—	1,351	825	5,115	—	—	—
Sitka Harbor	82	165,033	171,769	40,780	139,883	2,638	662
Skagway Harbor	739,518	45,293	3,383	144	11,598	271	—
Valdez Harbor	—	47,910	180,989	65,223,519	—	—	—
Anchorage	321,219	8,315	1,182,530	126,020	—	—	663
Kodiak Harbor	315	16,114	509,338	406,759	—	—	—
Iliuliuk Harbor ^{1/}	<u>4,480</u>	<u>42,888</u>	<u>269,797</u>	<u>166,699</u>	<u>—</u>	<u>—</u>	<u>96,193</u>
TOTALS	1,560,767	1,133,237	2,711,089	66,057,989	911,742	314,574	175,752

^{1/} Unalaska

Source: U.S. Army Corps of Engineers, Waterborne Commerce of the U.S., 1979.

FIGURE 4A
CARGO ACTIVITY OF CORPS OF ENGINEERS TOP 10 ALASKA PORTS
(EXCLUDING CRUDE OIL AT VALDEZ)
BASED ON TONS OF CARGO SHIPPED AND RECEIVED
1979



	<u>Volume</u>	<u>Percent</u>	<u>Volume Without Valdez Crude Oil</u>	<u>Percent</u>
Total	72,865,150	100.0%	7,794,544	100.0%
Foreign	2,694,004	3.7	2,694,004	34.5
Coastwise	68,769,078	94.3	3,698,472	47.5
Internal	1,402,068	2.0	1,402,068	18.0

Source: SH&E

movement of the top 10 Alaska ports is shown in Figure 4A. Excluding crude oil shipments, the activity of the top 10 Alaska ports includes approximately 60% of the state's total waterborne commerce.

4.3 Alaska's domestic trade moves primarily among Alaska ports, and between Alaska ports and the Pacific Northwest and California.

For purposes of this analysis, the data are divided into dry cargo and tanker shipments or, basically, petroleum and non-petroleum cargoes.

Tables 4B and 4C show the states of origin and destination of cargoes moving to and from Alaska. These relationships are shown graphically in Figures 4B and 4C.

Coastwise dry cargo shipments out of Alaska move primarily to the Pacific Northwest (Seattle and Tacoma). Of the total dry cargo shipments 51.2% move to the Pacific Northwest. California receives 15.9% and internal shipments within Alaska account for the remaining 32.9%.

Tanker movements from Alaska are destined primarily for refineries in California that account for 62.5% of the tanker shipments. Panama, the Pacific Northwest, and Hawaii also receive varying amounts of Alaska crude based on the 1979 data.

Coastwise dry cargo shipments to Alaska originate almost exclusively in the Pacific Northwest (77.3%, as shown in Table 4C). 22.6% is shown as being received from other Alaska ports. It should be noted that, for the top ten ports, the portion of Alaska internal (non-petroleum) cargo was 18%, whereas for the entire state it was 32.9% (shipments) and 22.6% (receipts). This reflects the fact that much of the cargo to and from Alaska's smaller ports is moved through the larger ports. In other words, a very high proportion of the cargo moving to and from Alaska's smaller ports is internal or intrastate cargo.

Tanker cargo being received in Alaska consists of petroleum products for consumption in the state. As can be seen from Table 4C, petroleum products flow almost exclusively from California; a high percentage is redistributed from larger to smaller Alaska ports.

Figures 4B and 4C show that non-self propelled vessels constitute a large percentage of the cargo flows in both directions except for crude oil movement out of Alaska.

Table 4D shows the pattern of cargo receipts in the coastwise trade. Anchorage is the primary receiving port for consumer products, building materials and food. Whittier also serves the Anchorage market with the same categories of cargo. Most of the high volume cargoes (commodities registering annual volumes of 10,000 tons or more) moving into Alaskan ports other than Anchorage and Whittier, consist of petroleum products.

Table 4E shows the distribution of high volume cargoes out of Alaska ports. These data reflect the movement of logs, wood products, fish, crude oil and miscellaneous chemicals out of Alaska ports, as well as the redistribution of petroleum products.

TABLE 4B

**COASTWISE CARGO SHIPMENTS FROM ALASKA
TO OTHER POINTS IN THE U.S., INCLUDING ALASKA
(Short Tons)**

1979

DRY CARGO

	<u>N. Atlantic</u>	<u>California</u>	<u>Pacific N.W.</u>	<u>Alaska</u>	<u>Total</u>	<u>Percent</u>
Self-propelled	22	129,079	380,406	366,885	876,392	61.9%
Non self-propelled ^{1/}	—	95,192	343,693	98,671	537,556	38.1
TOTAL	22	224,271	724,099	465,556	1,413,948	100.0%
PERCENT	>1	15.9	51.2	32.9	100.0%	

TANKER

	<u>North Atlantic</u>	<u>Gulf</u>	<u>California</u>	<u>Pacific N.W.</u>	<u>Hawaii</u>	<u>Alaska</u>	<u>Virgin Islands</u>	<u>Panama ^{2/}</u>	<u>Total</u>	<u>Percent</u>
Self-propelled	122,709	141,864	41,262,929	9,832,980	2,246,805	445,958	131,111	11,419,688	65,604,044	99.4%
Non self-propelled ^{1/}	—	—	—	38,613	—	368,796	—	—	407,409	.6
TOTAL	122,709	141,864	41,262,929	9,871,593	2,246,805	814,754	131,111	11,419,688	66,011,453	100.0%
PERCENT	.2	.2	62.5	15.0	3.4	1.2	.2	17.3	100.0%	

^{1/} Barges^{2/} Most shipments to Panama are reloaded on smaller vessels for onward movement to the Gulf.Source: Maritime Administration, Domestic Waterborne Trade 1978-1979.

TABLE 4C

**COASTWISE CARGO SHIPMENTS TO ALASKA
FROM OTHER POINTS IN THE U.S., INCLUDING ALASKA
(Short Tons)**

1979

DRY CARGO

	<u>S. Atlantic</u>	<u>Gulf</u>	<u>Pacific N.W.</u>	<u>Alaska</u>	<u>Total</u>	<u>Percent</u>
Self-propelled	1,922	68	920,093	366,885	1,288,968	62.6%
Non self-propelled	—	—	672,992	98,671	771,663	37.4
TOTAL	1,922	68	1,593,085	465,556	2,060,631	100.0%
PERCENT	<1	<1	77.3	22.6	100.0%	

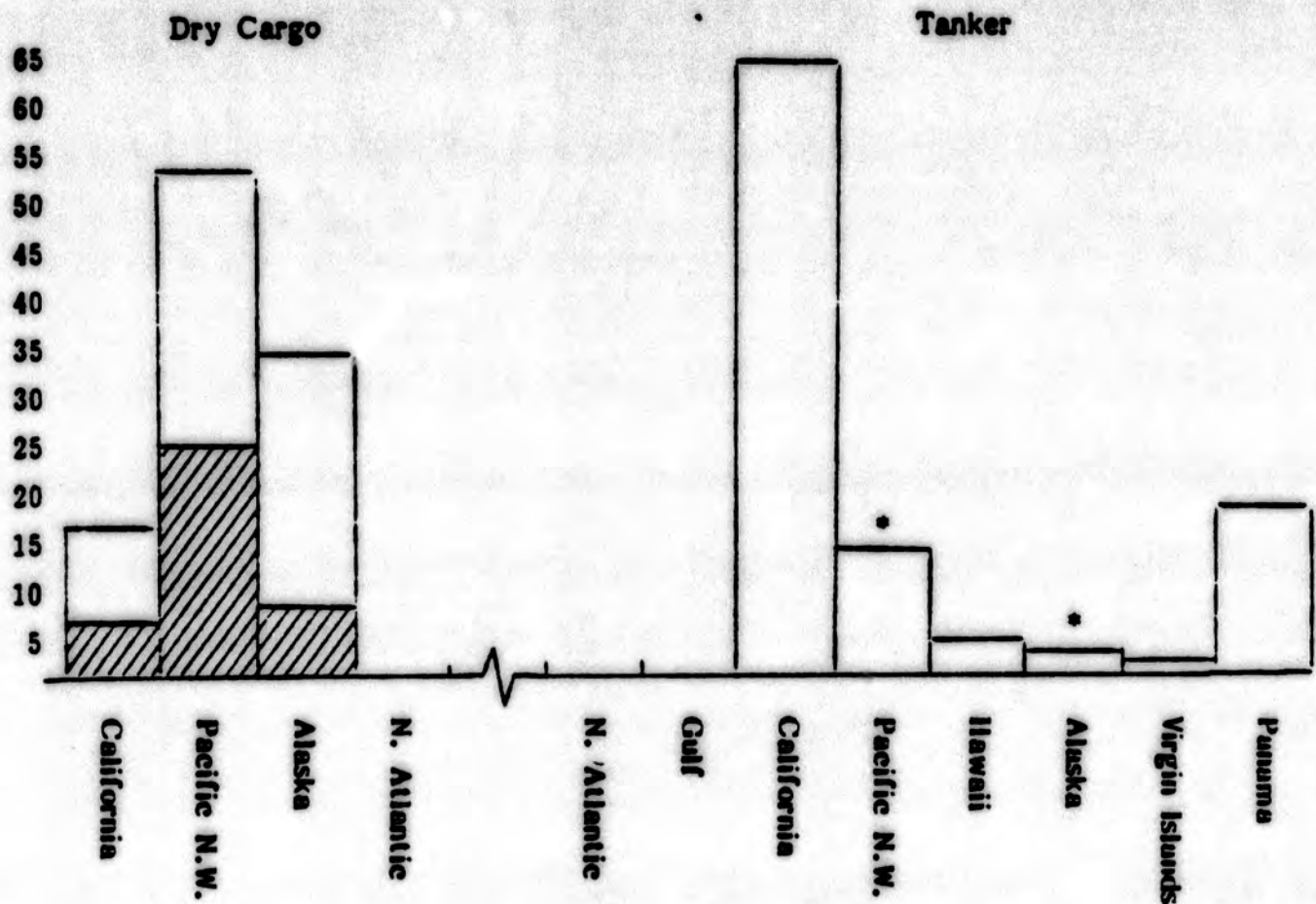
TANKER

	<u>California</u>	<u>Pacific N.W.</u>	<u>Alaska</u>	<u>Total</u>	<u>Percent</u>
Self-propelled	592,856	14,951	445,958	1,053,765	58.4%
Non self-propelled	382,832	—	368,796	751,628	41.6
TOTAL	975,688	14,951	814,754	1,805,393	100.0%
PERCENT	54.0	1.0	45.0	100.0%	

Source: Maritime Administration, Domestic Waterborne Trade 1975-1979.

FIGURE 4B
COASTWISE TRADE
SHIPPED FROM ALASKA IN SHORT TONS
1979

Percent Moving to Key Locations



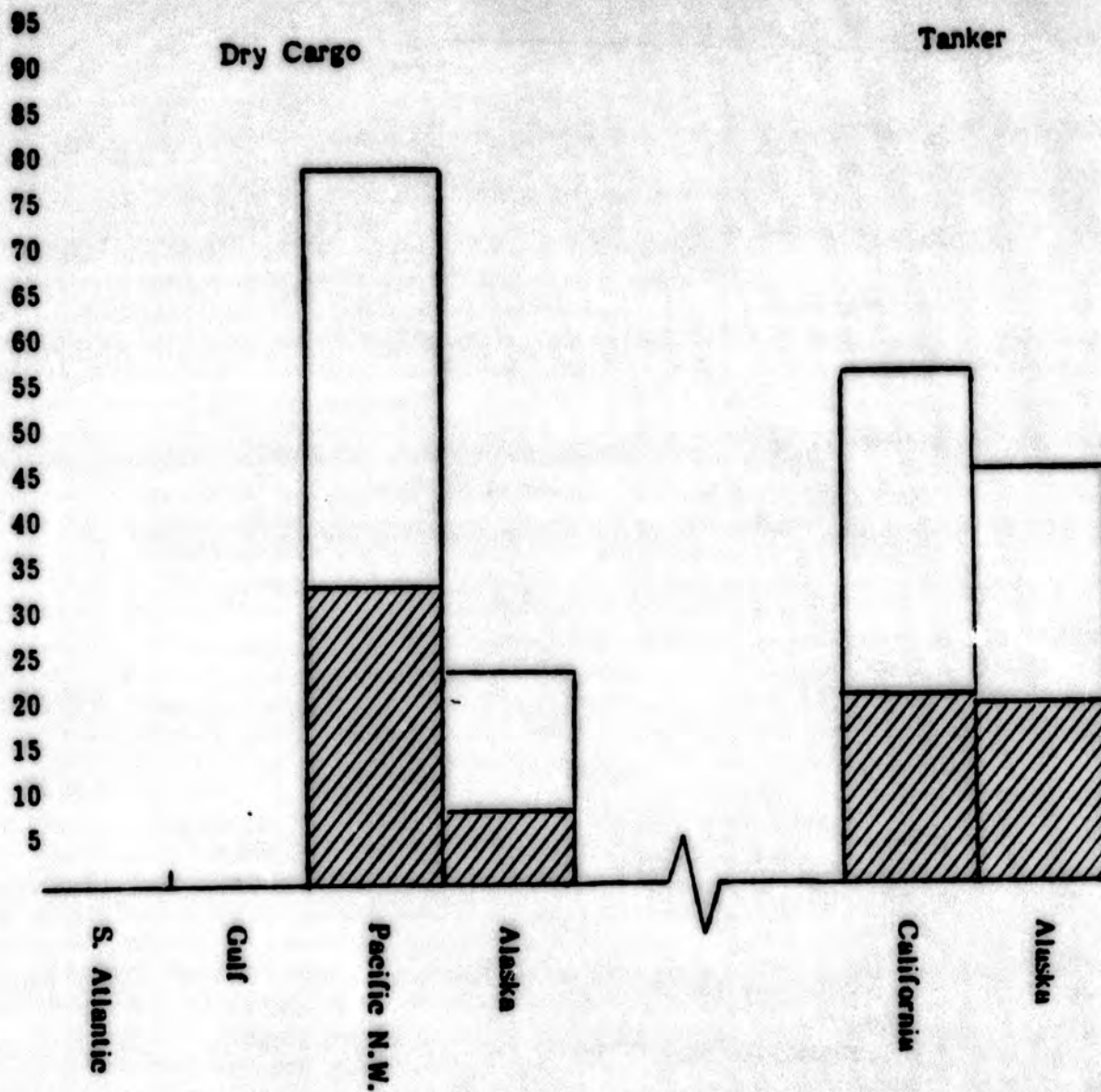
= non self-propelled vessels

* = small percentage non self-propelled vessels

Source: SH&E

FIGURE 4C
COASTWISE TRADE
SHIPPED TO ALASKA IN SHORT TONS
1979

Percent Coming From Key Locations



 = non self-propelled vessels

Source: SH & E

TABLE 4D

1979 ALASKA COASTWISE TRADE RECEIVING PORTS

(Listing of Commodities of 10,000 Short Tons
or More Annual Volume)

<u>Commodity No.</u>	<u>Commodity</u>	<u>Short Tons</u>
KETCHIKAN		
2911	Gasoline	43,538
2912	Jet Fuel	33,060
2914	Distillate	145,726
2915	Residual	43,805
2916	Lubricating Oil	32,376
SITKA		
2810	Sodium Hydroxide	35,457
2819	Basic Chemicals	10,945
2891	Miscellaneous Chemical Products	12,431
2915	Residual Fuel Oil	71,292
VALDEZ		
2911	Gasoline	35,701
2914	Jet Fuel	26,160
2914	Distillate	116,286
ANCHORAGE		
0141	Fresh and Frozen Vegetables	15,836
1121	Coal and Lignite	10,329
2011	Meat, Fresh, Frozen, Chilled	17,776
2021	Dairy Products	16,734
2081	Alcoholic Beverages	37,936
2094	Groceries	93,346
2099	Miscellaneous Food Products	35,497
2421	Lumber	36,733
2431	Veneer Plywood	15,777
2511	Furniture and Fixtures	27,829
2911	Gasoline	126,949
2913	Kerosine	153,339
2918	Asphalt, Tar	22,980
2991	Petroleum and Coal Products	12,453
3241	Building Cement	59,212
3291	Miscellaneous Nonmetallic Minerals	29,175
3317	Iron and Steel	11,636
3411	Fabricated Metal Products	29,428
3711	Motor Vehicles	16,193

- continued -

TABLE 4D (Continued)

<u>Commodity No.</u>	<u>Commodity</u>	<u>Short Tons</u>
KODIAK		
1121	Coal and Lignite	12,010
2031	Fish and Shellfish, Prepared	72,987
2081	Alcoholic Beverages	18,617
2912	Jet Fuel	10,654
2914	Distillate Fuel	38,951
2915	Residual Fuel Oil	23,610
ILIULIUK		
2911	Gasoline	50,738
2913	Kerosene	63,319
2914	Distillate Fuel Oil	132,063
BETHEL		
2912	Jet Fuel	16,081
2991	Petroleum and Coal	15,606
CORDOVA		
2914	Distillate Fuel Oil	13,610
DILLINGHAM		
2911	Gasoline	13,663
HOMER		
2911	Gasoline	64,446
2915	Residual Fuel Oil	32,444
JUNEAU		
2094	Groceries	11,800
2911	Gasoline	24,882
2914	Distillate Fuel Oil	40,938
2921	Liquefied Gases	33,720

- continued -

TABLE 4D (Continued)

<u>Commodity No.</u>	<u>Commodity</u>	<u>Short Tons</u>
NAKNEK RIVER		
2911	Gasoline	16,450
2914	Distillate Fuel Oil	11,802
PETERSBURG		
2914	Distillate Fuel Oil	12,391
SEWARD		
2914	Distillate Fuel Oil	13,158
2421	Lumber	11,307
WHITTIER		
2081	Alcoholic Beverages	14,432
2421	Lumber	21,718
2891	Miscellaneous Chemicals	11,528
3317	Iron and Steel Pipe	11,094
3411	Fabricated Metal Products	12,440
3511	Machinery, except electrical	17,059
4011	Iron and Steel Scrap	19,970

Source: U.S. Corps of Engineers, Waterborne Commerce of the United States, 1979.

TABLE 4E
1979 ALASKA COASTWISE TRADE SHIPPING PORTS
 (Listing of Commodities of 10,000 Short Tons
 or More Annual Volume)

<u>Commodity No.</u>	<u>Commodity</u>	<u>Short Tons</u>
KETCHIKAN		
2611	Pulp	49,600
SITKA		
2611	Pulp	23,207
VALDEZ		
1311	Crude	65,070,606
2911	Gasoline	39,418
2912	Jet Fuel	13,399
2914	Distillate Fuel Oil	95,972
ANCHORAGE		
2031	Fish and Shellfish, prepared	22,974
3511	Machinery, except electrical	12,238
3711	Motor Vehicles	10,299
3911	Miscellaneous Manufactured Products	19,812
4112	Commodities, NEC ^{1/}	28,032
KODIAK		
2031	Fish and Shellfish, prepared	75,605
2081	Alcoholic Beverages	16,281
4112	Commodities, NEC ^{1/}	223,896
ILIULIUK		
2031	Fish and Shellfish, prepared	13,615
2911	Gasoline	32,098
2912	Jet Fuel	42,646
2914	Distillate Fuel Oil	48,389
CORDOVA		
2031	Fish and Shellfish, prepared	15,232

^{1/} Not Elsewhere Classified

- continued -

TABLE 4E (Continued)

<u>Commodity No.</u>	<u>Commodity</u>	<u>Short Tons</u>
DILLINGHAM		
2031	Fish and Shellfish, prepared	12,204
HOMER		
2411	Logs	42,617
2871	Nitrogenous Chemicals	32,039
JUNEAU		
4112	Commodities, NEC	10,230
KING COVE		
2031	Fish and Shellfish, prepared	12,224
NAKNEK RIVER		
2031	Fish and Shellfish, prepared	10,746
PETERSBURG		
2416	Wood Chips	13,787
SEWARD		
2416	Wood Chips	16,278
OTHER SOUTHEASTERN ALASKA PORTS		
2411	Logs	77,797
2412	Rafted Logs	849,638
2416	Wood Chips	33,578
2421	Lumber	32,830

TABLE 4E (Continued)

<u>Commodity No.</u>	<u>Commodity</u>	<u>Short Tons</u>
SOUTHERLY SIDE OF ALASKA PENINSULA		
1311	Crude Petroleum	5,089,260
2411	Logs	197,017
2416	Wood Chips	84,855
2421	Lumber	28,097
2819	Basic Chemicals	17,453
2871	Nitrogenous Chemical Fertilizers	629,260
2921	Liquefied Gases	1,110,877

Source: U.S. Corps of Engineers, Waterborne Commerce of the United States, 1979.

5. U.S.-FLAG VS. FOREIGN-FLAG OPERATING COSTS

The purpose of this chapter is to compare U.S.-flag and foreign-flag vessel operating costs for typical Alaska coastwise services.

5.1 The methodology used in this analysis compared U.S.-flag and foreign-flag costs on existing service routes.

The methodology employed in this analysis relies on a computer model that simulates vessel service systems. In other words, the model accepts vessel characteristics, service characteristics, and basic cost data and then calculates the total cost of providing a service. This cost is then divided by the units carried to provide a cost per unit. This cost per unit then becomes the required freight rate, hereinafter referred to as RFR, that must be earned to sustain the service. This means that the weighted average rate per unit of all of the commodities carried in the service must equal or surpass the calculated RFR. The computer model is called a Required Freight Rate or RFR Model.

All ocean carriers experience the same types or categories of costs. The actual costs themselves may vary widely depending on the flag of registry, the size of vessel, the size of the crew, the type of propulsion and the efficiency of management.

In general terms, ocean shipping involves costs in the following categories:

- Capital
- Manning and Subsistence
- Fuel
- Maintenance and Repair (M&R)
- Supplies and Equipment
- Insurance
- Cargo Handling
- Other Port Costs
- Agency, Brokerage, and Commission
- Waterway Tolls and Pilot Fees
- Corporate Overhead

There are exceptions, however. For example, tanker movements seldom involve meaningful cargo handling costs, because this function is provided by shipboard pumps, the cost of which is already part of other cost categories. Other types of shipping have other costs, e.g., container ownership in the case of container systems.

In this study we have selected a cross-section of service routes in the Alaska coastwise trade and have estimated the underlying cost elements for both U.S.-flag vessels and hypothetical foreign-flag vessels. The service is the same for both vessels; only the flag of registry of the vessels differs.

It is important to note that although the routes and service systems selected are similar to those already in existence in the Alaska trades, the underlying costs employed in the RFR model are independent estimates. The study team did not have access to proprietary cost data from U.S. companies currently serving the Alaska trade. The team did have access to generalized U.S.-flag and foreign-flag cost data from which average or typical underlying costs were constructed. For example, U.S. (and some foreign) data on manning and construction costs are available from MarAd. A number of publications track shipbuilding costs (indices). Fuel cost is published in price lists by oil companies. Obviously, in many instances professional judgment was also required in estimating specific cost elements for both U.S. and foreign-flag operations.

The reader should also be reminded that while competition and value of service, or "what the traffic will bear," establish short term freight rates for each commodity, costs set the limits for freight rates in the long term. In other words, although cost and rate may not be the same or even similar for any given commodity at any given time, in the long run (and/or over a mixture of commodities carried in the same service), rates are, in fact, cost determined. Put another way, over time, rates will fluctuate but will tend to average out at the level of costs.^{1/} Hence, the cost-based RFR method is a valid approach for determining the relative impact of differing governmental policies which affect the long term character of a shipping market.

To give an example, in the liner trades a carrier may sometimes have excess capacity. Since he is committed to a schedule, he will sometimes drop the rate on one or more commodities to less than the total cost of carrying those commodities in order to attract business. As long as the reduced rate covers the out-of-pocket cost of carrying the commodity and makes a contribution to system costs, the carrier is better off than if it had not carried the cargo. He does this, of course, only with the knowledge that at some other time, he will be able to recover the loss, and thus generate long term revenues in line with long term costs. There are obvious dangers associated with this type of pricing, as well as inequities. Most liner carriers maintain a mix of rates on commodities, and raise and lower rates at various times. Therefore, some rates may be substantially higher than the full cost of moving the cargo, and others may be less. The result is that actual rates vary above and below the average cost of service calculated at any point in time. But revenues as a whole will track costs; the introduction of cost changes in a trade will be reflected in rates proportionally.

The RFR model was used to calculate costs for eight services, as follows:

Service	Commodity
Containership - Anchorage/Seattle	Consumer items and fish/fish products
Ro/Ro ship - Anchorage/Tacoma	Consumer items and motor vehicles
VLCC - Valdez/Los Angeles	Crude oil
VLCC - Valdez/Panama	Crude oil
Handy-Size Tanker - Panama/Gulf	Crude oil
Product Tanker - Los Angeles/Anchorage	Petroleum products
Tug Barge - Whittier/Seattle	Building materials and general cargo
Bulk Carrier - Ketchikan/Seattle	Logs and ore

^{1/} See Martingale, pg. 2.40

5.2. There are a variety of technical factors and overlapping market sectors that make the maritime transportation industry complex and difficult to comprehend.

In order to understand the competitive and market forces at work, it is necessary to briefly examine the characteristics of the maritime industry.

Traditionally, the maritime industry groups its vessels and services under three headings: "liner," "non-liner" or "tramps" (dry bulk), and "tanker" (liquid bulk). However, a careful look at today's industry shows that those terms no longer describe the structure of the industry. For example:

- "Tramp" vessels have been largely supplanted in the bulk trades by vessels operating on long-term charters, on fairly regular routes, sometimes having been designed to carry a single commodity between specific ports for the vessel's life.
- Hybrid services have appeared which carry "liner" cargoes in "bulk" services.
- New technologies and operating plans allow some vessels to switch between liner and bulk or bulk and tanker service virtually at will.

Many features of the industry play a role in defining who is competing with whom in a given market sector. The following five characteristics distinguish shipping market sectors from each other:

- the type of cargo;
- shipment size;
- affreightment terms;
- vessel technology; and
- vessel route and schedule.

Cargo Type

All cargo can be classified under two main headings. General cargo is that which is packaged in some manner, or is unitized by its nature, and can be marked and counted. Bulk cargo is that which is free-flowing and unpackaged, can be shoveled, pumped, etc., and cannot be marked or counted. Bulk cargo is commonly further divided into liquid and dry, due to the volumes involved and the differing technology required. Hence, cargo can be broadly classified into three groupings:

- general cargo;
- dry bulk cargo; and
- liquid bulk cargo.

Within these major headings are special categories of cargo requiring special handling technology and arrangements such as heavy lift, reefer, wheeled vehicles, corrosives, etc.

Consignment Size

From the standpoint of shipping economics, consignment size is important as it relates to vessel capacity. Using this guideline, three classifications of consignment size can be defined:

- shipload;
- less than shipload but large; and
- small.

Affreightment Terms

Shipping contracts are of two basic types:

- Bills of lading, which are contracts for a service, are short-term, and are associated with common carrier or liner service; and
- Charters which are contracts for shipping space, are often long-term, and are associated with non-common carrier service.

There are a number of different types of charters in use, including voyage, time, and bareboat charters, contracts of affreightment, and the limiting case, industrial carriage, whereby the shipper controls the vessel outright.

Vessel Technology

Vessels can be classified in many ways. In order to define the parameters of shipping markets, a useful breakdown is by degree of cargo specialization. The classifications would therefore be as follows:

- general purpose vessels (e.g., multipurpose, multideck conventional vessels, modern combined Ro/Ro-container carriers, tug-barge);
- semi-specialized vessels (e.g., single deck bulk carriers, reefer ships, chemical tankers, unit load vessels, OBO's, etc.);
- highly specialized vessels (e.g., ULCC's, woodchip carriers, LNG carriers, vehicle carriers, live sheep carriers, etc.).

Vessel Route and Schedule

Two basic vessel operating plans are possible—i.e., continuous service in the same trade area, or an irregular trading pattern taking the vessel anywhere there is cargo available (so-called "tramping"). If the pattern is regular, this may be on a scheduled or non-scheduled basis. Therefore, three route/schedule service types can be defined:

- regular/scheduled;
- regular/non-scheduled; and
- irregular.

5.3 In the Alaska coastwise trade there are essentially four types of service.

Basically, in this analysis the study team addressed four types of service:

- general cargo small shipment service;
- dry bulk shipload service;
- liquid bulk shipload service;
- parcel tanker service.

General Cargo Small Shipment Service

General cargo small shipment service caters to the needs of shippers of small consignments of a wide variety of goods. Carriers supplying this service are typically referred to as "liner" operators, although the term "liner" strictly refers to a type of service, not necessarily a type of vessel or cargo.

The vessels serving this market sector operate on regular routes and, most often, on a tightly scheduled basis. They offer a common carrier service; that is, they will (subject to certain conditions and limitations) accept cargo from any shipper in any quantity and carry it according to published rates and schedule. The shipping contract employed is the bill of lading. A highly variegated cargo mix is carried; many operators use general purpose vessels to serve the greatest variety of cargo possible (including reefer, heavy lift, bulk liquid, etc.), while others operate semi-specialized vessels and, thus, restrict themselves to certain classes of cargo (e.g., full container vessel operators cannot carry most non-containerizable cargo).

The containership and Ro/Ro service between Seattle/Tacoma and Anchorage and the tug-barge service between Whittier and Seattle that have been selected for analysis in this study fall into the category of general cargo small shipment service.

Dry Bulk Shipload Service

The dry bulk market is dominated by a small number of commodities moving in very large volume (the five "major bulks," viz., iron-ore, coal, grain, phosphates, and bauxite/alumina), plus a number of "minor bulk" commodities which move in shipload quantities. These shipments are invariably on a charter basis, including a large volume of industrial carriage. Terms range from voyage and trip charters to charters covering the life of the vessel. Multipurpose vessels are suitable for these cargoes, but have been increasingly superseded since the early 1960's by semi- or highly specialized single deck bulk vessels, including combination carriers, ore carriers, chip carriers, and so on. The trading pattern is sometimes irregular (as in the case of traditional tramping),

but more and more the vessels are trading in a fairly regular pattern over a long time period. Indeed, the greatest structural change in this market sector in recent years has been the shift away from "tramps" trading on a spot basis to vessels on long-term charters plying regular routes in the service of single clients. The emergence of resource-poor Japan as an industrial power has been a major factor in this development.

The ore and logs/chips service selected from Ketchikan to Seattle is classified as a dry bulk shipload service.

Liquid Bulk Shipload Service

The liquid bulk shipload, or tanker, sector is dominated by crude oil movements which are so large that they alone account for nearly half of all seaborne trade measured in tons and more than half measured in ton-miles.

The tanker trade bears many similarities to the dry bulk sector. Shipments are large, and the shipping terms are either charter or industrial carriage. The routes are fairly fixed by geographical circumstance, so even those vessels trading in the spot market tend to trade among a limited number of ports. The vessels are, in great part, highly specialized; for example, the very large crude carriers have no real prospect of entering any other trade, and even smaller tankers are generally suitable only for carrying grain in addition to their basic oil cargoes.

A large part of the world tanker fleet is directly owned by the oil companies, and a large part of the remainder is on a long-term charter to them. As a result, oil companies have a large degree of influence on the marketplace, and this is an important distinction between the liquid and dry bulk shipping sectors.

The VLCC service from Valdez to Los Angeles or Panama analyzed in this study falls in this category.

Parcel Liquid Bulk Service

The trade in parcel liquid bulk cargo is dominated by petrochemicals and specialized petroleum products, with tallow, vegetable and fish oils, and molasses making up most of the remainder of the cargo. The vessels generally operate on regular routes and often to a fairly fixed schedule. Multi-port itineraries are common.

5.4 U.S.-flag operators bear many cost disadvantages when compared to foreign-flag operators.

U.S.-flag operators, whether they ply the Jones Act trade or the international trade, share many of the same cost disadvantages.

- Crew wages — Generally, U.S. manning costs are higher than those of the foreign-flag competition. These higher costs are due in part to higher rates of compensation and in some cases higher manning levels. Some U.S.-flag vessels in international trade are given substantial subsidies to offset the cost disadvantage they suffer when compared with foreign-flag operators.
- Insurance — Insurance is usually higher because of higher U.S. vessel repair costs and typically higher levels of medical care, workmen's compensation, etc..
- Vessel acquisition — Vessel acquisition costs are higher because of higher U.S. construction costs. For some U.S. operators in foreign trade the cost differential is subsidized. The subsidy has not always covered the difference, particularly in times of world shipbuilding overcapacity. In addition, delivery schedules in the U.S. are said to be much slower, introducing a cost of delay. The requirement for U.S. subsidized operators to purchase U.S.-built vessels has been temporarily waived, allowing U.S.-flag carriers to buy vessels overseas at cheaper prices. This does not apply in the domestic trades, however.
- Vessel Maintenance and Repair — Vessel M&R is higher due to the necessity for making repairs in the U.S.
- Overhead — Overhead is sometimes higher due to higher general levels of salary for U.S. headquarters office staffs, to the extra staff required for government compliance activity, and the fact that foreign lines use agents in the U.S.
- Fuel costs — In many cases U.S. fuel costs are higher because steam turbine vessels are employed which have higher fuel consumption rates than foreign-flag vessels that traditionally use slow speed diesel vessels.

5.5 The difference in U.S.-flag and foreign-flag vessel operating costs on key Alaska coastwise trade routes varies depending upon specific circumstances.

RFR calculator runs were made for the services cited in Part 5.1 of this report, in each case comparing U.S.-flag with foreign-flag vessels. In each case, similar ships and identical services were assumed.

Containership - Anchorage/Seattle

In this comparison, the ship characteristics and voyage characteristics for both U.S.-flag and foreign-flag services are the same except that the foreign-

flag vessel uses diesel machinery. In addition, the foreign-flag vessel is assumed to employ a smaller crew—28 vs. 41. This is a typical foreign-flag crew size for vessels of this class. It should be noted, however, that crew sizes vary throughout the world, and even from voyage to voyage on a given vessel.

Table 5A shows the cost summary for both U.S.- and foreign-flag service. The differences in cost favor the foreign-flag operation. It is estimated that U.S. containership costs for the Anchorage/Seattle service approximate \$1,055 per TEU ^{1/}, while foreign-flag costs would be about \$915 per TEU. How TEU's would equate to tons depends upon how much cargo is loaded into each container; this is highly variable, and depends upon the commodity characteristics and loading efficiency. No general guideline is practical or meaningful.

Ro/Ro Ship - Anchorage/Tacoma

In this comparison, ship and voyage characteristics are the same, with the exception of diesel machinery which was assumed for the foreign-flag operation. The U.S.-flag employs a crew of 41 versus 28 for the foreign-flag.

Cost summaries comparing the U.S.- and foreign-flag service are shown in Table 5B. It is estimated that U.S. Ro/Ro costs for the Anchorage/Seattle service approximate \$920 per TEU, while foreign-flag costs would be on the order of \$800 per TEU.

It will be observed that, for container and Ro/Ro services, the cost by U.S.- and foreign-flag vessels is similar in most cost categories. This is because there is no flag-influenced aspect in those categories. For example, containers cost the same no matter what the nationality of the owner — shipowners of all nationalities purchase them, in effect, from a common worldwide pool. Similarly, the cost of cargo handling is the same to all similarly situated vessel owners, irrespective of flag. Cost differences will occur, for the most part, only in those categories outlined in Section 5.4.

Tug Barge - Seattle/Whittier

In this comparison, the introduction of a foreign-flag tug barge rail ferry on the Seattle/Whittier run was analyzed. Current U.S.-flag tugs have diesel powerplants, so the cost differences occur in cost categories other than fuel. There are no costs borne by ocean carriers associated with railcars, railcar handling and other cargo related costs, since these are for the account of the railroads. The ocean shipping cost per railcar is estimated at approximately \$620 in the U.S.-flag case, and approximately \$505 for a foreign-flag operator.

Cost summaries comparing the U.S.- and foreign-flag service are shown in Table 5C.

^{1/} TEU is "Twenty-foot Equivalent Unit," the standard measure of output in the container trades. In Alaska, most or all containers are 35' or 40' long, and based on total cubic volume are considered equivalent to two TEU's.

TABLE 5A

**SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR CONTAINERSHIP OPERATIONS
ANCHORAGE/SEATTLE**

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>
MANNING AND SUBSISTENCE	70,637.14	75.95
FUEL	63,448.54	68.22
M-R	10,285.71	11.06
SUPPLIES AND EQUIPMENT	1,182.86	1.27
INSURANCE	8,485.71	9.12
CAPITAL COSTS	30,857.14	33.18
STEVEDORING COSTS	87,750.00	94.35
TERMINAL COSTS	241,800.00	260.00
PORT COSTS	60,000.00	64.52
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CONTAINER COSTS	76,371.43	82.12
POSITIONING COSTS	143,000.00	153.76
FEEDER TRANSPORTATION COSTS	0.00	0.00
AGENCY, BROKERAGE, AND COMMISSION	18,600.00	20.00
CORPORATE OVERHEAD	169,358.13	182.10
TOTAL	981,774.66	1,055.67

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>
MANNING AND SUBSISTENCE	41,040.00	44.13
FUEL	48,215.96	48.62
M-R	9,000.00	9.68
SUPPLIES AND EQUIPMENT	1,182.86	1.27
INSURANCE	4,937.14	5.31
CAPITAL COSTS	15,428.57	16.59
STEVEDORING COSTS	87,750.00	94.35
TERMINAL COSTS	241,800.00	260.00
PORT COSTS	60,000.00	64.52
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CONTAINER COSTS	76,371.43	82.12
POSITIONING COSTS	143,000.00	153.76
FEEDER TRANSPORTATION COSTS	0.00	0.00
AGENCY, BROKERAGE, AND COMMISSION	18,600.00	20.00
CORPORATE OVERHEAD	106,332.28	114.34
TOTAL	650,858.24	914.69

TABLE 5B

**SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR RO/RO SHIP OPERATIONS
ANCHORAGE/SEATTLE**

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>
MANNING AND SUBSISTENCE	54,940.00	49.50
FUEL	80,303.27	72.35
M-R	5,000.00	4.50
SUPPLIES AND EQUIPMENT	900.00	0.81
INSURANCE	11,600.00	10.45
CAPITAL COSTS	72,000.00	64.86
STEVEDORING COSTS	76,500.00	68.92
TERMINAL COSTS	288,600.00	260.00
PORT COSTS	44,000.00	39.64
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CONTAINER COSTS	36,382.50	32.78
POSITIONING COSTS	176,000.00	158.56
FEEDER TRANSPORTATION COSTS	0.00	0.00
AGENCY, BROKERAGE, AND COMMISSION	24,200.00	21.80
CORPORATE OVERHEAD	153,604.55	138.38
TOTAL	1,024,030.32	922.55

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>
MANNING AND SUBSISTENCE	31,920.00	28.76
FUEL	57,906.61	52.17
M-R	4,000.00	3.60
SUPPLIES AND EQUIPMENT	900.00	0.81
INSURANCE	6,240.00	5.62
CAPITAL COSTS	36,000.00	32.43
STEVEDORING COSTS	76,500.00	68.92
TERMINAL COSTS	288,600.00	260.00
PORT COSTS	44,000.00	39.64
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CONTAINER COSTS	36,382.50	32.78
POSITIONING COSTS	176,000.00	158.56
FEEDER TRANSPORTATION COSTS	0.00	0.00
AGENCY, BROKERAGE, AND COMMISSION	24,200.00	21.80
CORPORATE OVERHEAD	186,724.88	166.15
TOTAL	889,373.96	801.74

TABLE 5C
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR TUG BARGE OPERATIONS
SEATTLE/WHITTIER

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER RAILCAR</u>
MANNING AND SUBSISTENCE	18,720.00	59.62
FUEL	91,131.00	290.23
M-R	2,000.00	6.37
SUPPLIES AND EQUIPMENT	4,000.00	12.74
INSURANCE	13,800.00	43.31
CAPITAL COSTS	86,000.00	170.34
CORPORATE OVERHEAD	9,760.58	31.00
GROSS TOTAL	195,211.57	621.69

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER RAILCAR</u>
MANNING AND SUBSISTENCE	13,440.00	42.80
FUEL	91,131.00	290.23
M-R	1,600.00	5.10
SUPPLIES AND EQUIPMENT	4,000.00	12.74
INSURANCE	7,960.00	25.35
CAPITAL COSTS	32,000.00	101.91
CORPORATE OVERHEAD	7,901.63	25.16
GROSS TOTAL	158,032.63	503.29

VLCC - Valdez/Los Angeles

In this comparison, ship and voyage characteristics are basically the same for both U.S.- and foreign-flag operations. The exceptions are number of crew and the vessel's capital and associated costs. The foreign-flag vessel uses a steam turbine that has a crew of 24 versus 28 for the U.S.-flag vessel.

For the assumed vessel, which is a composite of typical vessels in the trade, U.S.-flag costs are estimated at approximately \$6.00 per ton, while an equivalent foreign-flag vessel's costs would be approximately \$4.60 per ton. RFR results appear in Table 5D.

It should be noted that the figures relate only to true and normal ocean shipping cost categories as recognized in normal shipping economies practice, and may not include all charges levied by the oil companies for purposes of calculating netbacks. However, these other charges are not truly part of ocean shipping, and more importantly would not be affected, other things held equal, by the flag of the vessel (examples would include in-transit inventory cost or risk assessments). Consequently, they have not been included. All costs which are affected by provisions in the Jones Act are included.

VLCC - Valdez/Panama

Analogous to the above, costs were estimated for the longer Valdez/Panama voyage. Results appear in Table 5E.

Handy-Size Tanker - Panama/Gulf

To close the loop for crude oil deliveries from Valdez to the U.S. Gulf, comparison was made of U.S.- versus foreign-flag tankers of a type which typifies the Panama-U.S. Gulf Coast segment. In this case, it was assumed the foreign-flag vessel would be diesel powered. The results appear in Table 5F.

Product Tanker - Los Angeles/Anchorage

In this comparison, ship and voyage characteristics are the same for both U.S.- and foreign-flag operations with the exception of diesel propulsion and crew size. The foreign-flag vessels use a crew of 24 vs. 28 for the U.S.-flag.

The cost per ton for U.S.-flag is \$12.82 vs. \$7.86 for foreign-flag.

Table 5G provides a cost summary for both U.S.- and foreign-flag operations.

Bulk Carrier - Ketchikan/Seattle

In this comparison, identical ship and voyage characteristics were used except for main propulsion (diesel for foreign-flag) and crew size. A crew of 27 was assumed for the U.S.-flag and 24 for the foreign-flag. The cost comparison provided in Table 5H shows that the U.S.-flag operation costs \$16.48 per ton vs. \$13.07 for the foreign-flag operation.

TABLE 5D
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR VLCC OPERATIONS
VALDEZ/LOS ANGELES

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	224,500.74	1.07
MANNING AND SUBSISTENCE	86,990.71	0.72
FUEL	227,090.91	1.89
M-R	11,229.44	0.09
SUPPLIES AND EQUIPMENT	3,743.15	0.03
INSURANCE	23,956.13	0.20
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	140,000.00	1.17
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	717,599.08	5.98

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	112,294.37	0.94
MANNING AND SUBSISTENCE	46,714.46	0.39
FUEL	227,090.91	1.89
M-R	7,486.29	0.06
SUPPLIES AND EQUIPMENT	3,743.15	0.03
INSURANCE	13,924.50	0.12
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	140,000.00	1.17
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	551,253.68	4.59

TABLE 5E
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR VLCC OPERATIONS
VALDEZ/PANAMA

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	480,000.00	4.00
MANNING AND SUBSISTENCE	185,920.00	1.55
FUEL	535,500.00	4.46
M-R	24,000.00	0.20
SUPPLIES AND EQUIPMENT	8,000.00	0.07
INSURANCE	51,200.00	0.43
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	140,000.00	1.17
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	1,424,620.00	11.87

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	240,000.00	2.00
MANNING AND SUBSISTENCE	99,840.00	0.83
FUEL	535,500.00	4.46
M-R	16,000.00	0.13
SUPPLIES AND EQUIPMENT	8,000.00	0.07
INSURANCE	29,760.00	0.25
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	140,000.00	1.17
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	1,069,100.00	8.91

TABLE 5F
SUMMARY OF U.S.- AND FOREIGN FLAG COSTS
FOR HANDY-SIZE TANKER OPERATIONS
PANAMA/GULF

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	\$1,714.29	1.48
MANNING AND SUBSISTENCE	66,366.67	1.90
FUEL	87,583.33	2.50
M-R	2,798.41	0.07
SUPPLIES AND EQUIPMENT	5,746.03	0.16
INSURANCE	11,492.06	0.33
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	2,400.00	0.07
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	227,600.79	6.50

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	25,057.14	0.74
MANNING AND SUBSISTENCE	33,786.67	0.97
FUEL	55,875.00	1.60
M-R	2,011.11	0.06
SUPPLIES AND EQUIPMENT	5,746.03	0.16
INSURANCE	7,067.62	0.20
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	2,400.00	0.07
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	132,743.57	3.79

TABLE 5G
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR PRODUCT TANKER OPERATIONS
LOS ANGELES/ANCHORAGE

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	102,205.71	2.92
MANNING AND SUBSISTENCE	131,266.67	3.75
FUEL	154,833.33	4.42
M-R	4,546.03	0.13
SUPPLIES AND EQUIPMENT	11,365.00	0.32
INSURANCE	22,730.16	0.65
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	21,600.00	0.62
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	448,626.98	12.82

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
CAPITAL COSTS	51,142.06	1.46
MANNING AND SUBSISTENCE	84,826.67	1.91
FUEL	98,250.00	2.81
M-R	3,977.78	0.11
SUPPLIES AND EQUIPMENT	11,365.00	0.32
INSURANCE	13,979.05	0.40
CARGO HANDLING	0.00	0.00
OTHER PORT COSTS	12,000.00	0.34
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
WATERWAY TOLLS AND PILOT FEES	0.00	0.00
CORPORATE OVERHEAD	0.00	0.00
TOTAL	257,541.43	7.36

TABLE 5H
SUMMARY OF U.S.- AND FOREIGN-FLAG COSTS
FOR BULK CARRIER OPERATIONS
KETCHIKAN/SEATTLE

U.S.-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
MANNING AND SUBSISTENCE	55,500.57	2.06	12.5
FUEL	33,497.22	1.24	7.5
M-R	6,857.14	0.25	1.5
SUPPLIES AND EQUIPMENT	8,000.00	0.30	1.8
INSURANCE	16,000.00	0.59	3.6
CAPITAL COSTS	30,401.43	1.13	6.9
STEVEDORING COSTS	182,250.00	6.75	41.0
OTHER CARGO HANDLING COSTS	14,850.00	0.55	3.3
PORT COSTS	30,000.00	1.11	6.7
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
AGENCY, BROKERAGE, AND COMMISSION	21,060.00	0.78	4.7
CORPORATE OVERHEAD	46,261.42	1.71	10.4
TOTAL	644,859.78	16.48	100.0
LESS OPERATING SUBSIDY	(0.00)	(0.00)	(0.0)
NET TOTAL	644,859.78	16.48	100.0

FOREIGN-FLAG

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
MANNING AND SUBSISTENCE	16,045.71	0.59	4.5
FUEL	17,036.11	0.66	5.1
M-R	6,857.14	0.25	1.9
SUPPLIES AND EQUIPMENT	8,000.00	0.30	2.3
INSURANCE	4,000.00	0.15	1.1
CAPITAL COSTS	15,204.00	0.57	4.3
STEVEDORING COSTS	182,250.00	6.75	51.6
OTHER CARGO HANDLING COSTS	14,850.00	0.55	4.2
PORT COSTS	30,000.00	1.11	8.5
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
AGENCY, BROKERAGE, AND COMMISSION	21,060.00	0.78	6.0
CORPORATE OVERHEAD	26,697.49	1.36	10.4
TOTAL	352,860.46	13.87	100.0
LESS OPERATING SUBSIDY	(0.00)	(0.00)	(0.0)
NET TOTAL	352,860.46	13.87	100.0

6. IMPACT OF SHIPPING COSTS

The purpose of this chapter is to determine the transportation cost impact on the people of Alaska due to the Merchant Marine Act of 1920.

6.1 There are many open questions concerning proposed removal of the coastwise laws which would have an impact on the savings actually realized.

There is no doubt that foreign-flag shipping costs, on the whole, are less than U.S.-flag shipping costs, and that Alaska and other non-contiguous states and territories are paying for premium transportation service, which they may not have chosen given a free choice. However, no one has attempted to focus on which of the Jones Act restrictions are the most onerous, or how service and competition would change if relevant provisions in the Merchant Marine Act of 1920 were repealed.

The following questions are important and should be addressed by all parties interested in the Jones Act restrictions as they apply to the Alaska coastwise trade.

- Is it the intent of those calling for the repeal of the coastwise laws to relieve the State of restrictions on U.S.-flag, U.S.-ownership, U.S.-constructed, U.S.-crew, or some combination of the four? Is it the intent to open up to foreign competition the Alaska intrastate trade and the fishing industry as well (e.g., to allow foreign-flag fishing vessels to land their catch in the U.S.)?
- What is the likely response by foreign shipping interests to a relaxation of the coastwise laws? On what terms would foreign owners and operators be interested in providing service? For example, would they be willing to subject themselves to FMC and ICC regulations and U.S. anti-trust laws? This question is fundamental to the savings which would actually be realized by the state as a result of any change in the Jones Act. Unfortunately, it cannot be answered in a vacuum — rather the answer will come only with experience.
- What immigration problems, if any, would result from employing foreign seamen in the Alaska coastwise trade?
- If foreign-flag operation can be introduced at great savings, what has impeded foreign-flag vessels from being used more extensively to carry coastwise cargoes via Canadian ports?

- What will be the U.S. labor reaction to the introduction of foreign ships and foreign crews and what secondary effect might this have on Alaska?

The above and other questions emphasize the necessity for developing a thoroughly considered strategy for dealing with the Jones Act.

6.2 A scenario assuming the repeal of the Merchant Marine Act of 1920 must be realistic.

To determine the probable cost premium paid by Alaska because of the requirement to use U.S.-flag vessels, it is first necessary to make some assumptions concerning service and competition. The assumptions will differ depending on whether the service is in the liner or bulk trade. Therefore, it is assumed for purposes of this analysis:

Liner Trade

- Only the Anchorage/Seattle trade has sufficient volume to attract foreign owners and operators.
- No change would be experienced in the intrastate trade, because the volume between any two points is low and there would be local resistance to replacing local seamen. It must be recalled that "cheap" seamen from far away are, in practice, not so cheap when risk factors and regular repatriation costs are added in.

Bulk Trades

The movement of petroleum products north and the shipment of Alaskan products south (other than fish which is carried in the liner service) is by bulk carriers — either tankers or dry bulk carriers.

- For purposes of this analysis it is assumed that vessels would be chartered on the same basic terms (charter length, etc.) as is done currently — all of the major oil companies satisfy their needs for carrying capacity through foreign-flag shipping where they can and operate their foreign shipping systems on economic and risk principles similar to those applied in U.S. trades. The practical significance of this is that current rates in the international spot market would not control rates in the Alaska trade even if foreign-flag ships were allowed to be used. Rather, long term chartered and owned vessels would continue to play a significant role, and would serve at rates lower than spot market high points, but higher than spot market low points.

- Ores and forest products currently do not move to the lower 48 market to any significant extent. It is uncertain the extent to which this situation would be changed by the reduction in transportation costs offered via use of foreign-flag vessels, since commodity movements depend primarily on commodity prices in market areas at any particular time, and this in turn is largely determined by numerous supply and demand factors in the commodity market which are unrelated to transportation.

6.3 For liner shipping services, Alaskan commerce is supporting a cost premium equivalent to about \$100 per capita per year.

Based on the data in Tables 5A, 5B and 5C, which relate liner waterborne services currently serving Alaska from the lower 48, the shipping cost premium being borne by Alaskan commerce can be calculated as follows:

	<u>Container</u>	<u>Ro/Ro</u>	<u>Tug Barges</u>
Cost per trip - U.S.-flag	\$981,774	\$1,024,030	\$195,217
Cost per trip - foreign-flag	850,658	889,373	158,023
Net	\$131,116	\$134,657	\$37,188
Voyages per year ^{1/}	X 155	X 100	X 200
	<u>\$20,322,980</u>	<u>\$13,465,700</u>	<u>\$7,437,600</u>

GRAND TOTAL \$41,226,280

The grand total of \$41 million equates to \$100 per resident per year.

The cost penalty applies to commodities as a group. How it may be distributed to any specific commodity or group of commodities is a matter of conjecture, and is not particularly meaningful in an economic sense because, if any one item is judged to pay less premium, then something else must automatically be said to pay more, and the net result to the people of Alaska is essentially the same. In general, when setting individual rates ocean carriers normally take account of the space taken up by one ton of that commodity, and charge a proportionately higher per ton rate to those using more space. As such, lighter density goods (e.g., fiberglass insulation, automobiles) will tend to carry a higher premium on a per ton basis than heavier density goods (such as canned goods).

^{1/} Containers and Ro/Ro voyages based on published schedules with allowance for vessel downtime. Tug barge voyages based on SH&E estimate of number of equivalent voyages, based on tonnages reported received at Whittier.

With regard to the relative impact on inbound versus outbound commodities, the most salient feature of Alaskan liner service is the directional imbalance. In transportation ratemaking, where there is competition, rates in the underutilized direction normally fall to low levels as carriers compete to obtain cargo to fill up otherwise empty space. Rates tend to fall to levels which cover only those costs directly attributable to that cargo, such as cargo handling and container shifting, among others. These types of costs would be the same for a foreign-flag operator, and thus it is unlikely foreign-flag competition would have much impact on southbound rates. It is northbound liner commodities which are most likely absorbing the cost premium. In practical terms, this means the direct (or initial) impact of the Jones Act is falling more heavily on Alaskan receivers and consumers rather than Alaskan businesses shipping their products southbound.

6.4 Alaska crude oil shipped south from Valdez is absorbing a \$225 million per year U.S.-flag cost premium.

It would appear that the Valdez/Los Angeles and Valdez/Gulf routes are most typical of Alaskan crude oil shipments. In the case of shipments to the Gulf, although single vessel voyages have been performed, the Panama pipeline will make two-stage voyages more appropriate as a base for analytical comparisons, and that is the voyage type which has been modeled here.

The RFR analyses summarized in Tables 5D, 5E and 5F indicated the differential between U.S.- and foreign-flag tanker operations in the Valdez to Los Angeles service is \$1.39 per long ton. For shipments from Valdez, transshipped at the Panama Canal and sent onward to the U.S. Gulf Coast, the differential would be \$5.67, based on Tables 5E and 5F.

Assuming an average annual U.S.-flag shipment rate of 80 million tons per year, with 2/3 moving to California and 1/3 to the Gulf Coast via Panama, the annual cost penalty ultimately being borne by Alaska through the netback mechanism is \$225 million.

6.5 Alaskans are paying a U.S.-flag cost premium of \$5.46 per long ton on petroleum products shipped north from Los Angeles.

Based on Table 4C, there are some 592,856 short tons (529,335 long tons) of petroleum products shipped north in tankers. The U.S.-flag cost premium absorbed by Alaskans under the scenario analyzed in this study is \$5.46 per long ton for an aggregate of \$2,890,000. Spread among the total population, the U.S.-flag cost premium is \$7.00 per capita annually in 1981 dollars. On a commodity basis, the U.S.-flag cost premium absorbed, for example, per gallon of gasoline would be approximately 1.6¢.

6.6 Alaskan wood products are absorbing a U.S.-flag cost premium of \$3.41 for southbound movements.

Alaskan wood products such as pulp, logs and lumber move predominately in the export trade. Some lumber and pulp products have moved south from the Ketchikan and Sitka areas to the Pacific Northwest. In those cases, the products bear a U.S.-flag cost premium of \$3.41 per ton.

7. REMARKS AND MAJOR CONCLUSIONS

- **Commerce of the State of Alaska moving in liner services is absorbing an aggregate annual cost of approximately \$41 million because of the restrictions imposed by the Merchant Marine Act of 1920.**
- **Due to the inherent directional imbalance of Alaska cargoes, the incidence of higher costs and rates is having the greatest impact on northbound cargoes.**
- **Alaska's net return from its oil sales is being reduced due to the additional costs imposed by the Jones Act, which, based on current conditions, are approximately \$225 million per year.**
- **The State of Alaska has some relief available from the Merchant Marine Act of 1920, in the form of the third and fourth proviso exceptions that allow coastwise cargoes to move through Canadian ports and on the Yukon River by non-U.S. vessels. This relief is currently not being exploited (in part due to the applicable restrictions). Non-use of this loophole does indicate that the cost savings ultimately available from use of foreign-flag vessels may not be as great as has sometimes been supposed.**
- **In the high-volume Anchorage-Pacific Northwest trade, the state may have a potential for reducing rates by stimulating backhaul cargoes. The extra cost of transportation for such cargoes would be low.**
- **In view of the Administration's apparent position to uphold the Jones Act, efforts to have it rescinded in toto will be difficult in the immediate future.**
- **Given the recent lifting of prohibitions on overseas-built vessels for U.S. subsidized trades, the State of Alaska may wish to consider an effort to obtain a waiver of the requirement to use vessels built in the U.S. and place less emphasis on changing the remainder of the Jones Act. As an example, in the case of the Valdez/Los Angeles tanker service, this change could eliminate about two-thirds of the penalty. Of course, this leaves unanswered what to do with the existing U.S.-built fleet. In effect, the build U.S. provision has amounted to a subsidy to the U.S. shipbuilding industry, long since paid but as yet not fully funded. The resolution to this problem will be found in the political, not the economic, arena.**
- **The State of Alaska is being served by a competitive liner transportation system, and, as such, rates are as low as can be expected, given the costs and constraints inherent in U.S.-flag shipping. It is certainly true that costs, and thus rates, could be lower if foreign-flag services were introduced. It should be recognized, however, that in modern containerized-type operations, the bulk of the costs are not flag related. Consequently, the scope for cost and rate reductions as a result of introduction of foreign-flag services is not as great proportionately as in other sectors of the merchant marine.**

APPENDIX A

**SECTION 27 OF THE
MERCHANT MARINE ACT OF 1920**

(S 27)

Coastwise
trade—Ameri-
can vessels—
not applicable.
Samoa
Islands.

Coastwise trade
vessels rebuilt
outside U.S.

Exception.

Date for taking
effect on Yukon
River.

Sec. 27.² That no merchandise shall be transported by water, or by land and water, on penalty of forfeiture thereof, between points in the United States, including Districts, Territories, and possessions thereof embraced within the coastwise laws, either directly or via a foreign port, or for any part of the transportation, in any other vessel than a vessel built in and documented under the laws of the United States and owned by persons who are citizens of the United States, or vessels to which the privilege of engaging in the coastwise trade is extended by sections 18 or 22 of this Act: *Provided*, That no vessel having at any time acquired the lawful right to engage in the coastwise trade, either by virtue of having been built in, or documented under the laws of the United States, and later sold foreign in whole or in part, or placed under foreign registry, shall hereafter acquire the right to engage in the coastwise trade: *Provided further*, That no vessel of more than five hundred gross tons which has acquired the lawful right to engage in the coastwise trade, by virtue of having been built in or documented under the laws of the United States, and which has later been rebuilt, shall have the right thereafter to engage in the coastwise trade, unless the entire rebuilding, including the construction of any major components of the hull or superstructure of the vessel, is effected within the United States, its Territories (not including trust territories), or its possessions: *Provided further*, That this section shall not apply to merchandise transported between points within the continental United States, including Alaska, over through routes heretofore or hereafter recognized by the Interstate Commerce Commission for which routes rate tariffs have been or shall hereafter be filed with said Commission when such routes are in part over Canadian rail lines and their own or other connecting water facilities: *Provided further*, That this section shall not become effective upon the Yukon River until the Alaska Railroad shall be completed and the Shipping Board shall find that proper facilities will be furnished for transportation by persons citizens of the

46 U.S.C. 283.

¹ With respect to transportation of passengers in the coastwise trade see 46 U.S.C. 280.

With respect to Hyder, Alaska, see Public Law 87-77, 78 Stat. 296, which reads as follows:

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, notwithstanding the provisions of law of the United States restricting to vessels of the United States the transportation of passengers and merchandise directly or indirectly from any port in the United States to another port of the United States, passengers may be transported on Canadian vessels between ports in southeastern Alaska, and passengers and merchandise may be transported on Canadian vessels between Hyder, Alaska, and other points in southeastern Alaska, and between Hyder, Alaska, and other points in the United States outside Alaska, either directly or via a foreign port, or for any part of the transportation until the Secretary of Commerce determines that United States-flag service is available to provide such transportation."

See also Act of December 27, 1950 (Public Law 561, 81st Cong.: 64 Stat. 1120), set forth in Appendix II.

Canadian
vessels
Transportation

² This provision was added by the first section of Public Law 714, 84th Cong., approved July 16, 1956 (70 Stat. 544) and was amended by the first section of Public Law 86-583 approved July 8, 1960 (74 Stat. 321). Public Law 86-583 provides that it will not withdraw coastwise privileges of vessels rebuilt in the United States under a contract executed before its enactment if the rebuilding is commenced not later than twenty-four months after such date of enactment.

- The State of Alaska should develop a coordinated, thoroughly-considered Jones Act strategy that seeks reasonable and politically attainable concessions in areas where the cost impacts are most meaningful. This approach has the potential for success, and can be instrumental in reducing the impact of the Jones Act on the State's economy.

(B 27A)

Exemption.

Great Lakes
railroad car
ferry.

United States for properly handling the traffic: *Provided further*, That this section shall not apply to the transportation of merchandise loaded on railroad cars or to motor vehicles with or without trailers, and with their passengers or contents when accompanied by the operator thereof, when such railroad cars or motor vehicles are transported in any railroad car ferry operated between fixed termini on the Great Lakes as a part of a rail route, if such car ferry is owned by a common carrier by water and operated as part of a rail route with the approval of the Interstate Commerce Commission, and if the stock of such common carrier by water, or its predecessor, was owned or controlled by a common carrier by rail prior to June 5, 1920, and if the stock of the common carrier owning such car ferry is, with the approval of the Interstate Commerce Commission, now owned or controlled by any common carrier by rail and if such car ferry is built in and documented under the laws of the United States: *Provided further*, That upon such terms and conditions as the Secretary of the Treasury by regulation may prescribe, and, if the transporting vessel is of foreign registry, upon a finding by the Secretary of the Treasury, pursuant to information obtained and furnished by the Secretary of State, that the government of the nation of registry extends reciprocal privileges to vessels of the United States, this section shall not apply to the transportation by vessels of the United States not qualified to engage in the coastwise trade, or by vessels of foreign registry, of (a) empty cargo vans, empty lift vans, and empty shipping tanks, (b) equipment for use with cargo vans, lift vans, or shipping tanks, (c) empty barges specifically designed for carriage aboard a vessel and equipment, excluding propulsion equipment, for use with such barges, and (d) any empty instrument for international traffic exempted from application of the customs laws by the Secretary of the Treasury pursuant to the provisions of section 322(a), Tariff Act of 1930 (19 U.S.C. 1322(a)), if the articles described in clauses (a) through (d) are owned or leased by the owner or operator of the transporting vessel and are transported for his use in handling his cargo in foreign trade: and (e) steredoring equipment and material, if such equipment and material is owned or leased by the owner or operator of the transporting vessel, or is owned or leased by the steredoring company contracting for the lading or unlading of that vessel, and is transported without charge for use in the handling of cargo in foreign trade: *Provided further*, That upon such terms and conditions as the Secretary of the Treasury by regulation may prescribe, and, if the transporting vessel is of foreign registry, upon his finding, pursuant to information furnished by the Secretary of State, that the government of the nation of registry extends reciprocal privileges to vessels of the United States, the Secretary of the Treasury may suspend the application of this section to the transportation of merchandise between points in the United States (excluding transportation between the continental United States and noncontiguous states, districts, territories, and possessions embraced within the coastwise laws) which, while moving in the foreign trade of the United States, is transferred

(b) 27)

for hire in violation of this section, such vessel shall be subject to a penalty of \$200 for each passenger so transported. Any penalty or forfeiture incurred under this section may be remitted or mitigated by the Secretary of the Treasury under the provisions of section 7 of title 46, United States Code.

Any corporation which has filed a certificate with the Secretary of the Treasury as provided for herein shall cease to be qualified under this section if there is any change in its status whereby it no longer meets the conditions above set forth, and any documents theretofore issued to it, pursuant to the provisions of this section, shall be forthwith surrendered by it to the Secretary of the Treasury.

(127)

from a non-self-propelled barge certified by the owner or operator to be specifically designed for carriage aboard a vessel and regularly carried aboard a vessel in foreign trade to another such barge owned or leased by the same owner or operator, without regard to whether any such barge is under foreign registry or qualified to engage in the coastwise trade: *Provided further*, That until April 1, 1964, and notwithstanding any other provisions of this section, any vessel documented under the laws of the United States and owned by persons who are citizens of the United States may, when operated upon a voyage in foreign trade, transport merchandise in cargo vans, lift vans, and shipping-tanks between points embraced within the coastwise laws for transfer to or when transferred from another vessel or vessels, so documented and owned, of the same operator when the merchandise movement has either a foreign origin or a foreign destination; but this proviso (1) shall apply only to vessels which that same operator owned, chartered or contracted for the construction of prior to the date of the enactment of this proviso, and (2) shall not apply to movements between points in the contiguous United States and points in Hawaii, Alaska, the Commonwealth of Puerto Rico and United States territories and possessions.

46 U.S.C.
883-1.

Sec. 27A. Notwithstanding any other provision of law, a corporation incorporated under the laws of the United States or any State, Territory, District, or possession thereof, shall be deemed to be a citizen of the United States for the purposes of and within the meaning of that term as used in sections 9 and 37 of the Shipping Act, 1916, as amended (46 U.S.C. 808, 835), section 27 of the Merchant Marine Act of 1920, as amended (46 U.S.C. 883), Revised Statutes, section 4370 (46 U.S.C. 316), and the laws relating to the documentation of vessels, if it is established by a certificate filed with the Secretary of the Treasury as hereinafter provided, that—

(a) a majority of the officers and directors of such corporation are citizens of the United States;

(b) not less than 90 per centum of the employees of such corporation are residents of the United States;

(c) such corporation is engaged primarily in a manufacturing or mineral industry in the United States or any Territory, District, or possession thereof;

(d) the aggregate book value of the vessels owned by such corporation does not exceed 10 per centum of the aggregate book value of the assets of such corporation; and

(e) such corporation purchases or produces in the United States, its Territories, or possessions not less than 75 per centum of the raw materials used or sold in its operations.

but no vessel owned by any such corporation shall engage in the fisheries or in the transportation of merchandise or passengers for hire between points in the United States, including Territories, Districts, and possessions thereof, embraced within the coastwise laws, except as a service for a parent or subsidiary corporation and except when such vessel is under demise or bareboat charter at

(B7A)

prevailing rates for use otherwise than in the domestic noncontiguous trades from any such corporation to a common or contract carrier subject to part 3 of the Interstate Commerce Act, as amended, which otherwise qualifies as a citizen under section 2 of the Shipping Act, 1916, as amended (46 U.S.C. 802), and which is not connected, directly or indirectly, by way of ownership or control with such corporation.

As used herein (1), the term "parent" means a corporation which controls, directly or indirectly, at least 50 per centum of the voting stock of such corporation, and (2), the term "subsidiary" means a corporation not less than 50 per centum of the voting stock of which is controlled, directly or indirectly, by such corporation or its parent, but no corporation shall be deemed to be a "parent" or "subsidiary" hereunder unless it is incorporated under the laws of the United States, or any State, Territory, District, or possession thereof, and there has been filed with the Secretary of the Treasury a certificate as hereinafter provided.

Vessels built in the United States and owned by a corporation meeting the conditions hereof which are non-self-propelled or which, if self-propelled, are of less than five hundred gross tons shall be entitled to documentation under the laws of the United States, and except as restricted by this section, shall be entitled to engage in the coastwise trade and, together with their owners or masters, shall be entitled to all the other benefits and privileges and shall be subject to the same requirements, penalties, and forfeitures as may be applicable in the case of vessels built in the United States and otherwise documented or exempt from documentation under the laws of the United States.

Vessels,
barges,
operations.

A corporation seeking hereunder to document a vessel under the laws of the United States or to operate a vessel exempt from documentation under the laws of the United States shall file with the Secretary of the Treasury of the United States a certificate under oath, in such form and at such times as may be prescribed by him, executed by its duly authorized officer or agent, establishing that such corporation complies with the conditions of this section above set forth. A "parent" or "subsidiary" of such corporation shall likewise file with the Secretary of the Treasury a certificate under oath, in such form and at such time as may be prescribed by him, executed by its duly authorized officer or agent, establishing that such "parent" or "subsidiary" complies with the conditions of this section above set forth, before such corporation may transport any merchandise or passengers for such parent or subsidiary. If any material matter of fact alleged in any such certificate which, within the knowledge of the party so swearing is not true, there shall be a forfeiture of the vessel (or the value thereof) documented or operated hereunder in respect to which the oath shall have been made. If any vessel shall transport merchandise for hire in violation of this section, such merchandise shall be forfeited to the United States. If any vessel shall transport passengers

APPENDIX B-1

CONTAINERSHIP - SEATTLE/ALASKA

U.S.-FLAG RESULTS

Page 3 of 7

CONTAINER SYSTEM DATA

<u>ITEM</u>	<u>AMOUNT</u>
CC[1] NUMBER OF CONTS. REQUIRED/SHIP SLOT	2.00 SETS/SLOT
CC[2] PERCENT OF CONTAINERS OWNED	100.00 PERCENT
CC[3] DEPRECIATION ON OWNED 20' CONTAINERS	0.00 \$/BOX-YEAR
CC[4] DEPRECIATION ON OWNED 40' CONTAINERS	1000.00 \$/BOX-YEAR
CC[5] LEASE COST OF 20' CONTAINERS	0.00 \$/BOX-YEAR
CC[6] LEASE COST OF 40' CONTAINERS	0.00 \$/BOX-YEAR
CC[7] M+R ON OWNED 20' CONTAINERS	0.00 \$/BOX-YEAR
CC[8] M+R ON OWNED 40' CONTAINERS	1400.00 \$/BOX-YEAR
CC[9] NUMBER OF TRU'S OF CHASSIS' PER SHIP SLOT	1.70
CC[10] 20' CHASSIS OWNERSHIP/LEASE COST	0.00 \$/YEAR
CC[11] 40' CHASSIS OWNERSHIP/LEASE COST	900.00 \$/YEAR
CC[12] AVG. REVENUE TONS PER 20' CONTAINER	1.00
CC[13] AVG. REVENUE TONS PER 40' CONTAINER	1.00
CC[14] CONTAINER SHIPPING FACTOR (EXTRA LIFTS)	0.00 PERCENT
CC[15] POSITIONING COSTS	110.00 \$/AVG. TEU

ADMINISTRATIVE COSTS

<u>ITEM</u>	<u>AMOUNT</u>
CA[1] AGENCY, BROKERAGE, AND COMMISSIONS (DOMESTIC)	40.00 \$/REVENUE TON
CA[2] AGENCY, BROKERAGE, AND COMMISSIONS (FOREIGN)	40.00 \$/REVENUE TON
CA[3] CORPORATE OVERHEAD	17.25 PERCENT OF GROSS COSTS

U.S.-FLAG RESULTS

Page 2 of 7

PORT INLAND AND PEPPER DATA

	<u>STEVEDORING</u> <u>S/LIPT</u>	<u>TERMINAL</u> <u>COSTS</u> <u>S/TE:1</u>	<u>STUFFING/</u> <u>STIPPING</u> <u>S/TE:1</u>	<u>PORT</u> <u>COSTS PER</u> <u>DIRECT</u> <u>CALL</u>	<u>PERCENT</u> <u>OF TEU'S</u> <u>WATER FED</u>	<u>PERCENT</u> <u>OF TEU'S</u> <u>LAND FED</u>	<u>WTR. FOR.</u> <u>VERS/PORT</u> <u>COST</u> <u>S/TEU FED</u>	<u>LAND</u> <u>PEPPER</u> <u>TRANS COST</u> <u>S/TEU FED</u>
FOREIGN	75.00	130.00	0.00	20,000.00	0.00	0.00	0.00	0.00
DOMESTIC	60.00	130.00	0.00	20,000.00	0.00	0.00	0.00	0.00

VESSEL SYSTEM COSTS

<u>ITEM</u>	<u>AMOUNT</u>
VC(1) DEPRECIATION	600,000 DOLLARS/VESSEL YEAR
VC(2) INTEREST	600,000 DOLLARS/VESSEL YEAR
VC(8) CREW COST	65,000 DOLLARS/MAN YEAR
VC(9) SUNDSTENCE	2,000 DOLLARS/MAN YEAR
VC(12) FUEL COST	150 DOLLARS/L. TON
VC(13) M+R	400,000 DOLLARS/SHIP YEAR
VC(14) SUPPLIES, EQUIP., STORES	46,000 DOLLARS/SHIP YEAR
VC(15) P+I INSURANCE	5,000 DOLLARS/MAN YEAR
VC(16) H+M INSURANCE	125,000 DOLLARS/SHIP YEAR

U.S.-FLAG RESULTS

Page 5 of 7

SHIP SYSTEM COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. DEPRECIATION	15,428.57	16.59	33.18
2. INTEREST	15,428.57	16.59	33.18
3. REQUIRED RETURN ON EQUITY	0.00	0.00	0.00
4. MANNING	68,528.57	73.69	147.37
5. SURVIVANCE	2,104.57	2.27	4.53
6. FUEL	61,448.54	64.22	136.45
7. M+R	10,785.71	11.06	22.12
8. SUPPLIES AND EQUIPMENT	1,182.86	1.27	2.54
9. P+I INSURANCE	5,271.43	5.67	11.34
10. H+M INSURANCE	3,214.29	3.46	6.91
TOTAL	184,897.11	198.81	397.63

OTHER VOYAGE COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. AGENCY, BROKERAGE, AND COMMISSION			
FOREIGN *	5,600.00	20.00	40.00
DOMESTIC *	13,000.00	70.00	40.00
2. WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.00
3. CORPORATE OVERHEAD	169,356.13	182.10	364.21
TOTAL	187,956.13	222.10	444.21

* UNIT COSTS PERTAIN TO CARGO LOADED IN FOREIGN OR DOMESTIC PORTS ONLY.

U.S.-FLAG RESULTSSERVICE SUMMARY

1. VOYAGE DAYS	9.0 DAYS
2. SCHEDULE MARGIN	0.1 DAYS
3. REQUIRED SEA SPEED	15.0 KNOTS
4. PORT TIME	1.3 DAYS
5. SEA TIME	7.7 DAYS
6. VOYAGES PER VESSEL YEAR	38.9
7. NUMBER OF LOADED 20'S OUTBOUND	0.0 CNTRS
8. NUMBER OF LOADED 40'S OUTBOUND	325.0 CNTRS
9. NUMBER OF LOADED 20'S INBOUND	0.0 CNTRS
10. NUMBER OF LOADED 40'S INBOUND	140.0 CNTRS
11. LOAD FACTOR--OUTBOUND	90.3 PERCENT
12. LOAD FACTOR--INBOUND	38.9 PERCENT
13. REQUIRED FLEET SIZE	4.0 VESSELS
14. FLEET VOYAGES PER YEAR	155.0
15. ANNUAL PRODUCTIVITY--OUTBOUND	101,111.1 TNU'S
16. ANNUAL PRODUCTIVITY--INBOUND	43,555.6 TNU'S
17. ANNUAL CAPACITY AT SCHEDULED SPEED	112,000.0 TNU'S *
18. ANNUAL CAPACITY AT FULL SPEED	113,470.9 TNU'S *
19. NUMBER OF 20 FT CONTAINERS REQUIRED	0.0 CNTRS
20. NUMBER OF 40 FT CONTAINERS REQUIRED	3,640.0 CNTRS

* CAPACITY IN EACH DIRECTION

U.S.-FLAG RESULTSCOST SUMMARY

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
MANNING AND SUBSISTENCE	70,637.14	75.95	151.91	7.2
FUEL	63,448.54	68.22	136.45	6.5
M+R	10,285.71	11.06	22.12	1.0
SUPPLIES AND EQUIPMENT	1,182.86	1.27	2.54	0.1
INSURANCE	8,485.71	9.12	18.25	0.9
CAPITAL COSTS	30,857.14	33.18	66.36	3.1
STEVEDORING COSTS	87,750.00	94.35	188.71	8.9
TERMINAL COSTS	241,800.00	260.00	520.00	24.6
PORT COSTS	60,000.00	64.52	129.03	6.1
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.00	0.0
CONTAINER COSTS	76,371.43	82.12	164.24	7.8
POSITIONING COSTS	143,000.00	153.76	307.53	14.6
PERDER TRANSPORTATION COSTS	0.00	0.00	0.00	0.0
AGENCY, BROKERAGE, AND COMMISSION	18,600.00	20.00	40.00	1.9
CORPORATE OVERHEAD	169,356.13	182.10	364.21	17.2
GROSS TOTAL *	981,774.66	1,055.67	2,111.34	100.0*
LESS OPERATING SUBSIDY	(0.00)	(0.00)	(0.00)	(0.0)
NET TOTAL *	981,774.66	1,055.67	2,111.34	100.0*
LCL STUIPPING AND STRIPPING	0.00	(0.00)	(0.00)	
TOTAL	981,774.66			

* EXCLUDES STUIPPING AND STRIPPING EXPENSE.

UNIT COSTS BY TYPE OF CARGO

<u>TYPE OF CARGO</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
CL CARGO	1,055.67	2,111.34
LCL CARGO	0.00	0.00

U.S.-FLAG RESULTSCONTAINER SYSTEM COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. OWNED CONTAINER DEPRECIATION			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	25,920.00		
2. LEASED CONTAINER RENT			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	0.00		
3. M+R ON OWNED CONTAINERS			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	36,288.00		
4. CHASSIS COSTS			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	14,163.43		
5. POSITIONING COSTS	143,000.00	-----	-----
TOTAL	219,371.43	235.88	471.77

PORT INLAND AND PRETER COSTS

	<u>STEVE- DORING</u>	<u>TERMINAL COSTS</u>	<u>ICL STUFFING/ SHIPPING</u>	<u>PORT COSTS</u>	<u>MTR. PDR. VESS/PORT COSTS</u>	<u>MTH. PDR. STEVE COSTS</u>	<u>LAND PDR. TRAN COST</u>	<u>TOTAL</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
FOREIGN	48,750.00	120,400.00	0.00	40,000.00	0.00	0.00	0.00	209,650.00		
DOMESTIC	39,000.00	120,400.00	0.00	20,000.00	0.00	0.00	0.00	179,400.00	-----	-----
TOTAL	87,750.00	241,800.00	0.00	60,000.00	0.00	0.00	0.00	389,550.00	418.87	417.74

FOREIGN-FLAG RESULTS SUMMARY

Page 1 of 7

SINAT, HELLFSEN AND KICHNER RFR CALCULATOR

SHIP CHARACTERISTICS

ITEM	AMOUNT
S[1] LENGTH	540 FEET
S[2] GRT	10,900 TONS
S[3] DWT	9,500 TONS
S[4] TEU CAPACITY	720 TEUS
S[5] MACHINERY TYPE	1 *
S[6] DESIGN SPEED	16 KNOTS
S[7] SHP	10,000
S[8] FUEL RATE AT FULL H.P.	40 L.TONS/DAY
S[9] PORT FUEL RATE	6 L.TONS/DAY
S[10] CREW COMPLEMENT	28

VOYAGE CHARACTERISTICS

ITEM	AMOUNT
V[1] SERVICE FREQUENCY	2.3 DAYS BETWEEN CALLS
V[2] ROUND TRIP VOYAGE LENGTH	2,900.0 MILES
V[3] PREFERRED R.T. VOYAGE TIME	9.0 DAYS
V[4] NUMBER OF FOREIGN PORT CALLS	2.0
V[5] NUMBER OF DOMESTIC PORT CALLS	1.0
V[6] ONE WAY MILES OF LOW SPEED OPS.	10.0
V[7] AVERAGE SPEED IN LOW SPEED OPS.	10.0 KNOTS
V[8] ONE WAY CANAL TRANSIT COSTS	0.0 DOLLARS
V[9] NUMBER OF VESSELS IN FLEET	4.0

* 1=STEAM, 2=DIESEL

LOAD CHARACTERISTICS

PORT	FULL 20'S LOADED	FULL 20'S DISCHARGED	FULL 40'S LOADED	FULL 40'S DISCHARGED	NUMBER OF TEU'S STIPPED OUTWIND	NUMBER OF TEU'S STRIPPED INROUND	DAYS IN PORT
FOREIGN	0	0	140	325	0	0	0.80
DOMESTIC	0	0	325	140	0	0	0.50

FOREIGN-FLAG RESULTSPORT INLAND AND PENDER DATA

	<u>STEVEDORING</u> <u>\$/LIFT</u>	<u>TERMINAL</u> <u>COSTS</u> <u>\$/TEU</u>	<u>STUDDING/</u> <u>STRIPPING</u> <u>\$/TEU</u>	<u>PORT</u> <u>COSTS PER</u> <u>DIRECT</u> <u>CALL</u>	<u>PERCENT</u> <u>OF TEU'S</u> <u>WATER FED</u>	<u>PERCENT</u> <u>OF TEU'S</u> <u>LAND FED</u>	<u>WTR. PDR.</u> <u>VESS/PORT</u> <u>COST</u> <u>\$/TEU FED</u>	<u>LAND</u> <u>PENDER</u> <u>TRANS COST</u> <u>\$/TEU FED</u>
FOREIGN	75.00	130.00	0.00	20,000.00	0.00	0.00	0.00	0.00
DOMESTIC	60.00	130.00	0.00	20,000.00	0.00	0.00	0.00	0.00

VESSEL SYSTEM COSTS

<u>ITEM</u>	<u>AMOUNT</u>
VC(1) DEPRECIATION	300,000 DOLLARS/VESSEL YEAR
W(7) INTEREST	300,000 DOLLARS/VESSEL YEAR
VC(8) CREW COST	55,000 DOLLARS/MAN YEAR
VC(9) SUBSISTENCE	2,000 DOLLARS/MAN YEAR
VC(12) PUEL COST	150 DOLLARS/L. TON
VC(13) H+R	350,000 DOLLARS/SHIP YEAR
VC(14) SUPPLIES, EQUIP., STORES	45,000 DOLLARS/SHIP YEAR
VC(15) P+I INSURANCE	5,000 DOLLARS/MAN YEAR
VC(16) H+M INSURANCE	80,000 DOLLARS/SHIP YEAR

FOREIGN-FLAG RESULTSCONTAINER SYSTEM DATA

<u>ITEM</u>	<u>AMOUNT</u>
CC(1) NUMBER OF CONTS. REQUIRED/SHIP SLOT	2.80 SETS/SLOT
CC(2) PERCENT OF CONTAINERS OWNED	100.00 PERCENT
CC(3) DEPRECIATION ON OWNED 20' CONTAINERS	0.00 \$/BOX-YEAR
CC(4) DEPRECIATION ON OWNED 40' CONTAINERS	1000.00 \$/BOX-YEAR
CC(5) LEASE COST OF 20' CONTAINERS	0.00 \$/BOX-YEAR
CC(6) LEASE COST OF 40' CONTAINERS	0.00 \$/BOX-YEAR
CC(7) M+R ON OWNED 20' CONTAINERS	0.00 \$/BOX-YEAR
CC(8) M+R ON OWNED 40' CONTAINERS	1400.00 \$/BOX-YEAR
CC(9) NUMBER OF TEU'S OF CHASSIS' PER SHIP SLOT	1.70
CC(10) 20' CHASSIS OWNERSHIP/LEASE COST	0.00 \$/YEAR
CC(11) 40' CHASSIS OWNERSHIP/LEASE COST	900.00 \$/YEAR
CC(12) AVG. REVENUE TONS PER 20' CONTAINER	1.00
CC(13) AVG. REVENUE TONS PER 40' CONTAINER	1.00
CC(14) CONTAINER SHIFTING FACTOR (EXTRA LIFTS)	0.00 PERCENT
CC(15) POSITIONING COSTS	110.00 \$/AVG. TEU

ADMINISTRATIVE COSTS

<u>ITEM</u>	<u>AMOUNT</u>
CA(1) AGENCY, BROKPHAGE, AND COMMISSIONS (DOMESTIC)	40.00 \$/REVENUE TON
CA(2) AGENCY, BROKPHAGE, AND COMMISSIONS (FOREIGN)	40.00 \$/REVENUE TON
CA(3) CORPORATE OVERHEAD	12.50 PERCENT OF GROSS COSTS

FOREIGN-FLAG RESULTS**SERVICE SUMMARY**

1. VOYAGE DAYS	9.0 DAYS
2. SCHEDULE MARGIN	0.1 DAYS
3. REQUIRED SEA SPEED	15.8 KNOTS
4. PORT TIME	1.3 DAYS
5. SEA TIME	7.7 DAYS
6. VOYAGES PER VESSEL YEAR	38.9
7. NUMBER OF LOADED 20'S OUTBOUND	0.0 CNTRS
8. NUMBER OF LOADED 40'S OUTBOUND	325.0 CNTRS
9. NUMBER OF LOADED 20'S INBOUND	0.0 CNTRS
10. NUMBER OF LOADED 40'S INBOUND	140.0 CNTRS
11. LOAD FACTOR--OUTBOUND	90.3 PERCENT
12. LOAD FACTOR--INBOUND	38.9 PERCENT
13. REQUIRED FLEET SIZE	4.0 VESSELS
14. FLEET VOYAGES PER YEAR	155.0
15. ANNUAL PRODUCTIVITY--OUTBOUND	101,111.1 TEU'S
16. ANNUAL PRODUCTIVITY--INBOUND	43,555.6 TEU'S
17. ANNUAL CAPACITY AT SCHEDULED SPEED	112,000.0 TEU'S *
18. ANNUAL CAPACITY AT FULL SPEED	113,470.9 TEU'S *
19. NUMBER OF 20 FT CONTAINERS REQUIRED	0.0 CNTRS
20. NUMBER OF 40 FT CONTAINERS REQUIRED	3,640.0 CNTRS

* CAPACITY IN EACH DIRECTION

FOREIGN-FLAG RESULTSSHIP SYSTEM COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. DEPRECIATION	7,714.29	8.29	16.59
2. INTEREST	7,714.29	8.29	16.59
3. REQUIRED RETURN ON EQUITY	0.00	0.00	0.00
4. MANNING	39,600.00	42.58	85.16
5. SURVIVENCY	1,440.00	1.55	3.10
6. FUEL	45,215.96	48.62	97.24
7. M+R	9,000.00	9.68	19.35
8. SUPPLIES AND EQUIPMENT	1,182.86	1.27	2.54
9. P+I INSURANCE	2,880.00	3.10	6.19
10. H+M INSURANCE	2,057.14	2.21	4.42
TOTAL	116,804.53	125.60	251.19

OTHER VOYAGE COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. AGENCY, BROKERAGE, AND COMMISSION			
FOREIGN *	5,600.00	20.00	40.00
DOMESTIC *	13,000.00	20.00	40.00
2. WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.00
3. CORPORATE OVERHEAD	106,332.28	114.34	228.67
TOTAL	124,932.28	154.34	308.67

* UNIT COSTS PERTAIN TO CARGO LOADED IN FOREIGN OR DOMESTIC PORTS ONLY.

FOREIGN-FLAG RESULTSCONTAINER SYSTEM COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. OWNED CONTAINER DEPRECIATION			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	25,920.00		
2. LEASED CONTAINER RENT			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	0.00		
3. M/R ON OWNED CONTAINERS			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	36,288.00		
4. CHASSIS COSTS			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	14,163.43		
5. POSITIONING COSTS	143,000.00	-----	----
TOTAL	219,371.43	235.88	471.77

PORT INLAND AND PEXTER COSTS

	<u>STEVE- DURING</u>	<u>TERMINAL COSTS</u>	<u>LCL STUFFING/ STRIPPING</u>	<u>PORT COSTS</u>	<u>MTR. PDR. VSS/PORT COSTS</u>	<u>MTR. PDR. STEVE COSTS</u>	<u>LAND PDR. TRAN COST</u>	<u>TOTAL</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
FOREIGN	48,750.00	120,900.00	0.00	40,000.00	0.00	0.00	0.00	209,650.00		
DOMESTIC	39,000.00	120,900.00	0.00	20,000.00	0.00	0.00	0.00	179,900.00	-----	----
TOTAL	87,750.00	241,800.00	0.00	60,000.00	0.00	0.00	0.00	389,550.00	418.87	837.74

FOREIGN-FLAG RESULTS

Page 7 of 7

COST SUMMARY

EXPENSE CATEGORY	COST PER VOYAGE	COST PER TEU	COST PER TON	PERCENT OF TOTAL
MANNING AND SUBSISTENCE	41,040.00	44.13	88.26	4.8
FUEL	45,215.96	48.62	97.24	5.3
MOR	9,000.00	9.68	19.35	1.1
SUPPLIES AND EQUIPMENT	1,182.86	1.27	2.54	0.1
INSURANCE	4,937.14	5.31	10.62	0.6
CAPITAL COSTS	15,428.57	16.59	33.18	1.8
STEVEDORING COSTS	87,750.00	94.35	188.71	10.3
TERMINAL COSTS	241,800.00	260.00	520.00	28.4
HART COSTS	60,000.00	64.52	129.03	7.1
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.00	0.0
CONTAINER COSTS	76,371.43	82.12	164.24	9.0
POSITIONING COSTS	143,000.00	153.76	307.53	16.8
FEEDER TRANSPORTATION COSTS	0.00	0.00	0.00	0.0
AGENCY, BROKERAGE, AND COMMISSION	18,600.00	20.00	40.00	2.2
CORPORATE OVERHEAD	106,332.28	114.34	228.67	12.5
GROSS TOTAL *	850,658.24	914.69	1,829.37	100.0*
LESS OPERATING SUBSIDY	(0.00)	(0.00)	(0.00)	(0.0)
NET TOTAL *	850,658.24	914.69	1,829.37	100.0*
LCL STUFFING AND STRIPPING	0.00	(0.00)	(0.00)	
TOTAL	850,658.24			

* EXCLUDES STUFFING AND STRIPPING EXPENSE.

UNIT COSTS BY TYPE OF CARGO

TYPE OF CARGO	COST PER TEU	COST PER TON
CL CARGO	914.69	1,829.37
LCL CARGO	0.00	0.00

APPENDIX B-2

RO/RO VESSEL - SEATTLE/ALASKA

U.S.-FLAG RESULTSSINAT, NELLIESEN AND EICHNER RPR CALCULATORSHIP CHARACTERISTICS

<u>ITEM</u>	<u>AMOUNT</u>
S(1) LENGTH	795 FEET
S(2) GRT	18,000 TONS
S(3) DWT	16,500 TONS
S(4) TEU CAPACITY	900 TEUS
S(5) MACHINERY TYPE	1 *
S(6) DESIGN SPEED	24 KNOTS
S(7) SHP	30,000
S(8) FUEL RATE AT FULL N.P.	150 L.TONS/DAY
S(9) PORT FUEL RATE	12 L.TONS/DAY
S(10) CREW COMPLEMENT	41

VOYAGE CHARACTERISTICS

<u>ITEM</u>	<u>AMOUNT</u>
V(1) SERVICE FREQUENCY	3.5 DAYS BETWEEN CALLS
V(2) ROUND TRIP VOYAGE LENGTH	2,800.0 MILES
V(3) PREFERRED R.T. VOYAGE TIME	7.0 DAYS
V(4) NUMBER OF FOREIGN PORT CALLS	1.0
V(5) NUMBER OF DOMESTIC PORT CALLS	1.0
V(6) ONE WAY MILES OF LOW SPEED OPS.	10.0
V(7) AVERAGE SPEED IN LOW SPEED OPS.	10.0 KNOTS
V(8) ONE WAY CANAL TRANSIT COSTS	0.0 DOLLARS
V(9) NUMBER OF VESSELS IN FLEET	2.0

* 1=STEAM, 2=DIESEL

LOAD CHARACTERISTICS

<u>PORT</u>	<u>PULL 20'S LOADED</u>	<u>PULL 20'S DISCHARGED</u>	<u>PULL 40'S LOADED</u>	<u>PULL 40'S DISCHARGED</u>	<u>NUMBER OF TEU'S STUPPED OUTBOUND</u>	<u>NUMBER OF TEU'S STRIPPED INBOUND</u>	<u>DAYS IN PORT</u>
FOREIGN	0	100	155	350	0	0	0.40
DOMESTIC	100	0	350	155	0	0	0.40

U.S.-FLAG RESULTS

Page 2 of 7

PORT INLAND AND PEERER DATA

	<u>STEVEDORING</u> <u>\$/LIFT</u>	<u>TERMINAL</u> <u>COSTS</u> <u>\$/TEU</u>	<u>STUFFING/</u> <u>STRIPPING</u> <u>\$/TEU</u>	<u>PORT</u> <u>COSTS PER</u> <u>DIRECT</u> <u>CALL</u>	<u>PERCENT</u> <u>OF TEU'S</u> <u>WATER PED</u>	<u>PERCENT</u> <u>OF TEU'S</u> <u>LAND PED</u>	<u>WTR. PDR.</u> <u>VESS/PORT</u> <u>COST</u> <u>\$/TEU PED</u>	<u>LAND</u> <u>PEERER</u> <u>TRANS COST</u> <u>\$/TEU PED</u>
FOREIGN	45.00	130.00	0.00	22,000.00	0.00	0.00	0.00	0.00
DOMESTIC	40.00	130.00	0.00	22,000.00	0.00	0.00	0.00	0.00

VESSEL SYSTEM COSTS

<u>ITEM</u>	<u>AMOUNT</u>
VC(1) DEPRECIATION	1,000,000 DOLLARS/VESSEL YEAR
VC(2) INTEREST	1,000,000 DOLLARS/VESSEL YEAR
VC(8) CREW COST	65,000 DOLLARS/MAN YEAR
VC(9) SUSTINENCE	2,000 DOLLARS/MAN YEAR
VC(12) FUEL COST	150 DOLLARS/L.TON
VC(13) M&R	250,000 DOLLARS/SHIP YEAR
VC(14) SUPPLIES, EQUIP., STORES	45,000 DOLLARS/SHIP YEAR
VC(15) P+I INSURANCE	5,000 DOLLARS/MAN YEAR
VC(16) H+M INSURANCE	375,000 DOLLARS/SHIP YEAR

U.S.-FLAG RESULTS

Page 3 of 7

CONTAINER SYSTEM DATA

<u>ITEM</u>	<u>AMOUNT</u>
CC[1] NUMBER OF CONTS. REQUIRED/SHIP SLOT	2.00 SMTS/SLOT
CC[2] PERCENT OF CONTAINERS OWNED	100.00 PERCENT
CC[3] DEPRECIATION ON OWNED 20' CONTAINERS	0.00 \$/BOX-YEAR
CC[4] DEPRECIATION ON OWNED 40' CONTAINERS	550.00 \$/BOX-YEAR
CC[5] LEASE COST OF 20' CONTAINERS	0.00 \$/BOX-YEAR
CC[6] LEASE COST OF 40' CONTAINERS	0.00 \$/BOX-YEAR
CC[7] M+R OF OWNED 20' CONTAINERS	0.00 \$/BOX-YEAR
CC[8] M+R ON CHRT. 40' CONTAINERS	1100.00 \$/BOX-YEAR
CC[9] NUMBER OF TEU'S OF CHASSIS' PER SHIP SLOT	0.00
CC[10] 20' CHASSIS OWNERSHIP/LEASE COST	0.00 \$/YEAR
CC[11] 40' CHASSIS OWNERSHIP/LEASE COST	0.00 \$/YEAR
CC[12] AVG. REVENUE TONS PER 20' CONTAINER	1.00
CC[13] AVG. REVENUE TONS PER 40' CONTAINER	1.00
CC[14] CONTAINER SHIPPING FACTOR (EXTRA LIFTS)	0.00 PERCENT
CC[15] POSITIONING COSTS	110.00 \$/AVG. TEU

ADMINISTRATIVE COSTS

<u>ITEM</u>	<u>AMOUNT</u>
CA[1] AGENCY, BROKERAGE, AND COMMISSIONS (DOMESTIC)	40.00 \$/REVENUE TON
CA[2] AGENCY, BROKERAGE, AND COMMISSIONS (FOREIGN)	40.00 \$/REVENUE TON
CA[3] CORPORATE OVERHEAD	15.00 PERCENT OF GROSS COSTS

U.S.-FLAG RESULTSSERVICE SUMMARY

1. VOYAGE DAYS	7.0 DAYS
2. SCHEDULE MARGIN	1.2 DAYS
3. REQUIRED SEA SPEED	19.5 KNOTS
4. PORT TIME	0.8 DAYS
5. SEA TIME	6.2 DAYS
6. VOYAGES PER VESSEL YEAR	50.0
7. NUMBER OF LOADED 20'S OUTBOUND	100.0 CNTRS
8. NUMBER OF LOADED 40'S OUTBOUND	350.0 CNTRS
9. NUMBER OF LOADED 20'S INBOUND	0.0 CNTRS
10. NUMBER OF LOADED 40'S INBOUND	155.0 CNTRS
11. LOAD FACTOR--OUTBOUND	88.9 PERCENT
12. LOAD FACTOR--INBOUND	34.4 PERCENT
13. REQUIRED FLEET SIZE	2.0 VESSELS
14. FLEET VOYAGES PER YEAR	100.0
15. ANNUAL PRODUCTIVITY--OUTBOUND	80,000.0 TEU'S
16. ANNUAL PRODUCTIVITY--INBOUND	31,000.0 TEU'S
17. ANNUAL CAPACITY AT SCHEDULED SPEED	90,000.0 TEU'S *
18. ANNUAL CAPACITY AT FULL SPEED	107,717.9 TEU'S *
19. NUMBER OF 20 FT CONTAINERS REQUIRED	560.0 CNTRS
20. NUMBER OF 40 FT CONTAINERS REQUIRED	1,960.0 CNTRS

* CAPACITY IN EACH DIRECTION

U.S.-FLAG RESULTS

Page 5 of 7

SHIP SYSTEM COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. DEPRECIATION	36,000.00	32.43	59.50
2. INTEREST	36,000.00	32.43	59.50
3. REQUIRED RETURN ON EQUITY	0.00	0.00	0.00
4. MANNING	53,300.00	48.02	88.10
5. SUBSISTENCE	1,640.00	1.48	2.71
6. FUEL	80,303.27	72.35	132.73
7. M+R	5,000.00	4.50	8.26
8. SUPPLIES AND EQUIPMENT	900.00	0.81	1.49
9. P+I INSURANCE	4,100.00	3.69	6.78
10. R+M INSURANCE	7,500.00	6.76	12.40
TOTAL	224,743.27	202.47	371.48

OTHER VOYAGE COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. AGENCY, BROKERAGE, AND COMMISSION			
FOREIGN *	6,200.00	20.00	40.00
DOMESTIC *	18,000.00	22.50	40.00
2. WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.00
3. CORPORATE OVERHEAD	153,604.55	138.38	253.89
TOTAL	177,804.55	180.88	333.89

* UNIT COSTS PERTAIN TO CARGO LOADED IN FOREIGN & DOMESTIC PORTS ONLY.

U.S.-FLAG RESULTSCONTAINER SYSTEM COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PPH VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. OWNED CONTAINER DEPRECIATION			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	12,127.50		
2. LEASED CONTAINER RENT			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	0.00		
3. M+R ON OWNED CONTAINERS			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	24,255.00		
4. CHASSIS COSTS			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	0.00		
5. POSITIONING COSTS	176,000.00	-----	----
TOTAL	212,382.50	191.34	351.05

PORT INLAND AND FRETER COSTS

	<u>STEVE- DORING</u>	<u>TERMINAL COSTS</u>	<u>LCL STUFFING/ STRIPPING</u>	<u>PORT COSTS</u>	<u>WTR. PDR. VESS/PORT COSTS</u>	<u>WTR. PDR. STEVE COSTS</u>	<u>LAND PDR. TRAN COST</u>	<u>TOTAL</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
FOREIGN	40,500.00	144,300.00	0.00	22,000.00	0.00	0.00	0.00	206,800.00		
DOMESTIC	36,000.00	144,300.00	0.00	22,000.00	0.00	0.00	0.00	202,300.00	-----	----
TOTAL	76,500.00	288,600.00	0.00	44,000.00	0.00	0.00	0.00	409,100.00	368.56	676.20

U.S.-FLAG RESULTSCOST SUMMARY

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
MANNING AND SUBSISTENCE	54,940.00	49.50	90.81	5.4
FUEL	80,303.27	72.35	132.73	7.8
M+R	5,000.00	4.50	8.26	0.5
SUPPLIES AND EQUIPMENT	910.00	0.81	1.49	0.1
INSURANCE	11,600.00	10.45	19.17	1.1
CAPITAL COSTS	72,000.00	64.86	119.01	7.0
STEVEDORING COSTS	76,500.00	68.92	126.45	7.5
TERMINAL COSTS	288,600.00	260.00	477.02	28.2
PORT COSTS	44,000.00	39.64	72.73	4.3
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.00	0.0
CONTAINER COSTS	36,382.50	32.78	60.14	3.6
POSITIONING COSTS	176,000.00	158.56	290.91	17.2
FEEDER TRANSPORTATION COSTS	0.00	0.00	0.00	0.0
AGENCY, BROKERAGE, AND COMMISSION	24,200.00	21.80	40.00	2.4
CORPORATE OVERHEAD	153,604.55	138.38	253.89	15.0
GROSS TOTAL *	1,024,030.32	922.55	1,692.61	100.0*
LESS OPERATING SUBSIDY	(0.00)	(0.00)	(0.00)	(0.0)
NET TOTAL *	1,024,030.32	922.55	1,692.61	100.0*
LCL STUFFING AND STRIPPING	0.00	(0.00)	(0.00)	
TOTAL	1,024,030.32			

* EXCLUDES STUFFING AND STRIPPING EXPENSE.

UNIT COSTS BY TYPE OF CARGO

<u>TYPE OF CARGO</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
CL CARGO	922.55	1,692.61
LCL CARGO	0.00	0.00

FOREIGN-FLAG RESULTS SUMMARY

SINAT, HOLLANDER AND PITCHER PER CALCULATION

COST SUMMARY

EXPENSE CATEGORY	COST PER VOYAGE	COST PER TEU	COST PER TON	PERCENT OF TOTAL
MANNING AND SUBSISTENCE	31,920.00	29.76	52.76	3.6
FUEL	57,906.61	52.17	95.71	6.5
WIF	4,000.00	3.60	6.61	0.4
SUPPLIES AND EQUIPMENT	900.00	0.81	1.49	0.1
INSURANCE	6,240.00	5.62	10.31	0.7
CAPITAL COSTS	36,000.00	32.43	59.50	4.0
STEVEDORING COSTS	76,500.00	68.92	126.45	8.6
TERMINAL COSTS	288,600.00	260.00	477.02	32.4
PORT COSTS	44,000.00	39.64	72.73	4.9
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.00	0.0
CONTAINER COSTS	36,382.50	32.78	60.14	4.1
POSITIONING COSTS	176,000.00	158.56	290.91	19.8
FEEDER TRANSPORTATION COSTS	0.00	0.00	0.00	0.0
AGENCY, BROKERAGE, AND COMMISSION	24,700.00	21.80	40.00	2.7
CORPORATE OVERHEAD	106,724.88	96.15	176.40	12.0
GROSS TOTAL *	889,373.98	801.24	1,470.04	100.0*
LESS OPERATING SUBSIDY	(0.00)	(0.00)	(0.00)	(0.0)
NET TOTAL *	889,373.98	801.24	1,470.04	100.0*
LCL STUFFING AND STRIPPING	0.00	(0.00)	(0.00)	
TOTAL	889,373.98			

* EXCLUDES STUFFING AND STRIPPING EXPENSE.

UNIT COSTS BY TYPE OF CARGO

TYPE OF CARGO	COST PER TEU	COST PER TON
CL CARGO	801.24	1,470.04

APPENDIX B-3

BARGE SERVICE - SEATTLE/ALASKA

U.S.-FLAG RESULTS

Page 1 of 7

STANT, WILHESEN AND RICHNER RFR CALCULATOR

SHIP CHARACTERISTICS

<u>ITEM</u>	<u>AMOUNT</u>
S[1] LENGTH	2,000 FEET
S[2] GRT	3,000 TONS
S[3] DWT	3,500 TONS
S[4] TEU CAPACITY	230 TEUS
S[5] MACHINERY TYPE	2 *
S[6] DESIGN SPEED	9 KNOTS
S[7] SHP	9,000
S[8] FUEL RATE AT FULL H.P.	30 L.TONS/DAY
S[9] PORT FUEL RATE	3 L.TONS/DAY
S[10] CREW COMPLEMENT	8

* 1=STEAM, 2=DIESEL

VOYAGE CHARACTERISTICS

<u>ITEM</u>	<u>AMOUNT</u>
V[1] SERVICE FREQUENCY	14.0 DAYS BETWEEN CALLS
V[2] ROUND TRIP VOYAGE LENGTH	2,550.0 MILES
V[3] PREFERRED R.T. VOYAGE TIME	14.0 DAYS
V[4] NUMBER OF FOREIGN PORT CALLS	1.0
V[5] NUMBER OF DOMESTIC PORT CALLS	1.0
V[6] ONE WAY MILES OF LOW SPEED OPS.	0.0
V[7] AVERAGE SPEED IN LOW SPEED OPS.	0.0 KNOTS
V[8] ONE WAY CANAL TRANSIT COSTS	0.0 DOLLARS
V[9] NUMBER OF VESSELS IN FLEET	1.0

LOAD CHARACTERISTICS

<u>PORT</u>	<u>FULL 20'S LOADED</u>	<u>FULL 20'S DISCHARGED</u>	<u>FULL 40'S LOADED</u>	<u>FULL 40'S DISCHARGED</u>	<u>NUMBER OF TEU'S STRIPPED OUTBOUND</u>	<u>NUMBER OF TEU'S STRIPPED INBOUND</u>	<u>DAYS IN PORT</u>
FOREIGN	0	0	45	112	0	0	1.00
DOMESTIC	0	0	112	45	0	0	1.00

PORT INLAND AND FERNER DATA

[illegible]

WESTERN SYSTEM COSTS

ITEM	AMOUNT
VC11 DEPRECIATION	700,000 DOLLARS/VESSEL YEAR
VC12 INTEREST	700,000 DOLLARS/VESSEL YEAR
VC18 CREW COST	56,500 DOLLARS/MAN YEAR
VC19 SUBSISTENCE	2,000 DOLLARS/MAN YEAR
VC112 FUEL COST	260 TONS/11,700
VC14 SUPPLIES, EXCISE, STORES	50,000 DOLLARS/SHIP YEAR
VC15 P+I INSURANCE	100,000 DOLLARS/SHIP YEAR
VC16 H+H INSURANCE	5,000 DOLLARS/MAN YEAR
	300,000 DOLLARS/SHIP YEAR

U.S.-FLAG RESULTS

Page 3 of 7

CONTAINER SYSTEM DATA

<u>ITEM</u>	<u>AMOUNT</u>
CC[1] NUMBER OF CONTS. REQUIRED/SHIP SLOT	4.00 SETS/SLOT
CC[2] PERCENT OF CONTAINERS OWNED	0.00 PERCENT
CC[3] DEPRECIATION ON OWNED 20' CONTAINERS	0.00 \$/BOX-YEAR
CC[4] DEPRECIATION ON OWNED 40' CONTAINERS	0.00 \$/BOX-YEAR
CC[5] LEASE COST OF 20' CONTAINERS	0.00 \$/BOX-YEAR
CC[6] LEASE COST OF 40' CONTAINERS	0.00 \$/BOX-YEAR
CC[7] M+R ON OWNED 20' CONTAINERS	0.00 \$/BOX-YEAR
CC[8] M+R ON OWNED 40' CONTAINERS	0.00 \$/BOX-YEAR
CC[9] NUMBER OF TEU'S OF CHASSIS' PER SHIP SLOT	0.00
CC[10] 20' CHASSIS OWNERSHIP/LEASE COST	0.00 \$/YEAR
CC[11] 40' CHASSIS OWNERSHIP/LEASE COST	0.00 \$/YEAR
CC[12] AVG. REVENUE TONS PER 20' CONTAINER	1.00
CC[13] AVG. REVENUE TONS PER 40' CONTAINER	2.00
CC[14] CONTAINER SHIPPIING FACTOR (EXTRA LIFTS)	0.00 PERCENT
CC[15] POSITIONING COSTS	0.00 \$/AVG. TEU

ADMINISTRATIVE COSTS

<u>ITEM</u>	<u>AMOUNT</u>
CA[1] AGENCY, BROKERAGE, AND COMMISSIONS (DOMESTIC)	0.00 \$/REVENUE TON
CA[2] AGENCY, BROKERAGE, AND COMMISSIONS (FOREIGN)	0.00 \$/REVENUE TON
CA[3] CORPORATE OVERHEAD	5.00 PERCENT OF GROSS COSTS

SERVICE SUMMARY

1. VOYAGE DAYS	14.0 DAYS
2. SCHEDULE MARGIN	0.2 DAYS
3. REQUIRED SEA SPEED	8.9 KNOTS
4. PORT TIME	2.0 DAYS
5. SEA TIME	12.0 DAYS
6. VOYAGES PER VESSEL YEAR	25.0
7. NUMBER OF LOADED 20'S OUTBOUND	0.0 CNTRS
8. NUMBER OF LOADED 40'S OUTBOUND	112.0 CNTRS
9. NUMBER OF LOADED 20'S INBOUND	0.0 CNTRS
10. NUMBER OF LOADED 40'S INBOUND	45.0 CNTRS
11. LOAD FACTOR--OUTBOUND	97.4 PERCENT
12. LOAD FACTOR--INBOUND	39.1 PERCENT
13. REQUIRED FLEET SIZE	1.0 VESSELS
14. FLEET VOYAGES PER YEAR	25.0
15. ANNUAL PRODUCTIVITY--OUTBOUND	5,600.0 TEU'S
16. ANNUAL PRODUCTIVITY--INBOUND	2,250.0 TEU'S
17. ANNUAL CAPACITY AT SCHEDULED SPEED	5,750.0 TEU'S *
18. ANNUAL CAPACITY AT FULL SPEED	5,831.0 TEU'S *
19. NUMBER OF 20 FT CONTAINERS REQUIRED	0.0 CNTRS
20. NUMBER OF 40 FT CONTAINERS REQUIRED	448.0 CNTRS

* CAPACITY IN EACH DIRECTION

U.S.-FLAG RESULTS

Page 5 of 7

SHIP SYSTEM COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. DEPRECIATION	28,000.00	89.17	89.17
2. INTEREST	28,000.00	89.17	89.17
3. REQUIRED RETURN ON EQUITY	0.00	0.00	0.00
4. MANNING	18,080.00	57.58	57.58
5. SURVIVENCY	640.00	2.04	2.04
6. FUEL	91,131.00	290.23	290.23
7. M&R	2,000.00	6.37	6.37
8. SUPPLIES AND EQUIPMENT	4,000.00	12.74	12.74
9. P+I INSURANCE	1,600.00	5.10	5.10
10. H+M INSURANCE	12,000.00	38.22	38.22
TOTAL	185,451.00	590.61	590.61

OTHER VOYAGE COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TEU</u>	<u>COST PER TON</u>
1. AGENCY, BROKERAGE, AND COMMISSION			
FOREIGN *	0.00	0.00	0.00
DOMESTIC *	0.00	0.00	0.00
2. WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.00
3. CORPORATE OVERHEAD	9,760.58	31.08	31.08
TOTAL	9,760.58	31.08	31.08

* UNIT COSTS PERTAIN TO CARGO LOADED IN FOREIGN OR DOMESTIC PORTS ONLY.

U.S.-FLAG RESULTS

CONTAINER SYSTEM COSTS

EXPENSE CATEGORY	COST PER VOYAGE	COST PER TEU	COST PER TON
1. OWNED CONTAINER DEPRECIATION			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	0.00		
2. LEASED CONTAINER RENT			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	0.00		
3. M-R ON OWNED CONTAINERS			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	0.00		
4. CHASSIS COSTS			
20 FT CONTAINERS	0.00		
40 FT CONTAINERS	0.00		
5. POSITIONING COSTS	0.00		
TOTAL	0.00	0.00	0.00

PORT INLAND AND FEEDER COSTS

[illegible]

U.S.-FLAG RESULTSCOST SUMMARY

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER THU</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
MANNING AND SUBSISTENCE	18,720.00	59.62	59.62	9.6
FUEL	91,131.00	290.23	290.23	46.7
M-R	2,000.00	6.37	5.37	1.0
SUPPLIES AND EQUIPMENT	4,000.00	12.74	12.74	2.0
INSURANCE	13,600.00	43.31	43.31	7.0
CAPITAL COSTS	56,000.00	178.34	178.34	28.7
STEVEDORING COSTS	0.00	0.00	0.00	0.0
TERMINAL COSTS	0.00	0.00	0.00	0.0
PORT COSTS	0.00	0.00	0.00	0.0
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.00	0.0
CONTAINER COSTS	0.00	0.00	0.00	0.0
POSITIONING COSTS	0.00	0.00	0.00	0.0
FEEDER TRANSPORTATION COSTS	0.00	0.00	0.00	0.0
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00	0.00	0.0
CORPORATE OVERHEAD	9,760.58	31.08	31.08	5.0
GROSS TOTAL *	195,211.57	621.69	621.69	100.0*
LESS OPERATING SUBSIDY	(0.00)	(0.00)	(0.00)	(0.0)
NET TOTAL *	195,211.57	621.69	621.69	100.0*
LCL STUPPING AND STRIPPING	0.00	(0.00)	(0.00)	
TOTAL	195,211.57			

* EXCLUDES STUPPING AND STRIPPING EXPENSE.

UNIT COSTS BY TYPE OF CARGO

<u>TYPE OF CARGO</u>	<u>COST PER THU</u>	<u>COST PER TON</u>
CL CARGO	621.69	621.69
LCL CARGO	0.00	0.00

FOREIGN-FLAG RESULTS SUMMARY

Page 1 of 1

COST SUMMARY

EXPENSE CATEGORY	COST PER WT 100'	COST PER TON	COST PER TON	PERCENT OF TOTAL
MANNING AND SUBSISTENCE	13,440.00	42.80	42.80	8.5
FUEL	91,131.00	290.73	290.73	57.7
M-R	1,600.00	5.10	5.10	1.0
SUPPLIES AND EQUIPMENT	4,000.00	12.74	12.74	2.5
INSURANCE	7,960.00	25.35	25.35	5.0
CAPITAL COSTS	32,000.00	101.91	101.91	20.2
STEVEERING COSTS	0.00	0.00	0.00	0.0
TERMINAL COSTS	0.00	0.00	0.00	0.0
PORT COSTS	0.00	0.00	0.00	0.0
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.00	0.0
CONTAINER COSTS	0.00	0.00	0.00	0.0
POSITIONING COSTS	0.00	0.00	0.00	0.0
FEEDER TRANSPORTATION COSTS	0.00	0.00	0.00	0.0
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00	0.00	0.0
CORPORATE OVERHEAD	7,901.63	25.16	25.16	5.0
GROSS TOTAL *	150,032.63	503.29	503.29	100.0*
LESS OPERATING SUBSIDY	(0.00)	(0.00)	(0.00)	(0.0)
NET TOTAL *	150,032.63	503.29	503.29	100.0*
LCL STUFFING AND STRIPPING	0.00	(0.00)	(0.00)	
TOTAL	150,032.63			

* EXCLUDES STUFFING AND STRIPPING EXPENSE.

UNIT COSTS BY TYPE OF CARGO

TYPE OF CARGO	COST PER TON	COST PER TON
CL CARGO	503.29	503.29
LCL CARGO	0.00	0.00

APPENDIX B-4

**CRUDE OIL TANKER
ALASKA/WEST COAST
PANAMA/GULF COAST**

U.S.-FLAG RESULTS
ALASKA/WEST COAST

Page 1 of 5

SINAT, NELLIESEN AND EICHNER RPR CALCULATOR

SHIP CHARACTERISTICS

<u>ITEM</u>	<u>AMOUNT</u>
S(1) LENGTH	170 FEET
S(2) GRT	80,000 TONS
S(3) CARGO DEADWEIGHT	120,000 TONS
S(4) GRAIN CRNIC	0 CURIC MTRS
S(5) MACHINERY TYPE	1 *
S(6) DESIGN SPEED	17 KNOTS
S(7) SHP	26,000
S(8) FUEL RATE AT FULL H.P.	138 L.TONS/DAY
S(9) PORT FUEL RATE	40 L.TONS/DAY
S(10) OFFICER COMPLEMENT	0
S(11) CREW COMPLEMENT	28

VOYAGE CHARACTERISTICS

<u>ITEM</u>	<u>AMOUNT</u>
V(1) VOYAGE LENGTH	4,000.0 MILES
V(2) PORT CALLS	2.0
V(3) MILES OP LOW SPEED OPS.	0.0
V(4) AVERAGE SPEED IN LOW SPEED OPS.	0.0 KNOTS
V(5) VOYAGE CANAL TRANSIT COSTS	0.0 DOLLARS

* 1=STEAM, 2=DIESEL

PORT CHARACTERISTICS

<u>PORT</u>	<u>TONS LOADED</u>	<u>TONS DISCHARGED</u>	<u>DAYS IN PORT</u>
DOMESTIC	120,000	0	1.50
FOREIGN	0	120,000	1.50

U.S.-FLAG RESULTS
ALASKA/WEST COAST

Page 2 of 5

UNIT PORT COSTS

<u>PORT</u>	<u>CARGO LOADING \$/TON</u>	<u>CARGO DISCHARGING \$/TON</u>	<u>DOCKAGE \$/PT-DAY</u>	<u>WHARFAGE \$/CARGO TON</u>	<u>MOORING \$/PORT CALL</u>	<u>PILOTS + TUGS \$/PORT CALL</u>	<u>PORT DUES \$/GRT</u>	<u>OTHER PORT COSTS \$/CALL</u>
DOMESTIC	0.00	0.00	0.00	0.00	0.00	0.00	0.000	100000.00
FOREIGN	0.00	0.00	0.00	0.00	0.00	0.00	0.000	40000.00

VESSEL SYSTEM COSTS

<u>ITEM</u>	<u>AMOUNT</u>
VC[1] MORTGAGE/LEASE PAYOUT	6,000,000 DOLLARS/VESSEL YEAR
VC[4] REQUIRED RETURN ON EQUITY	30 PERCENT/YEAR
VC[6] CREW COST	81,000 DOLLARS/MAN YEAR
VC[7] SURSISTENCE	2,000 DOLLARS/MAN YEAR
VC[8] FUEL COST	150 DOLLARS/L.TON
VC[9] M+R	300,000 DOLLARS/SHIP YEAR
VC[10] SUPPLIES, EQUIP., STORES	100,000 DOLLARS/SHIP YEAR
VC[11] P+I INSURANCE	5,000 DOLLARS/MAN YEAR
VC[12] H+M INSURANCE	500,000 DOLLARS/SHIP YEAR

ADMINISTRATIVE COSTS

<u>ITEM</u>	<u>AMOUNT</u>
CA[1] AGENCY, BROKERAGE, AND COMMISSIONS	0.00 \$/TON
CA[2] CORPORATE OVERHEAD	0.00 PERCENT OF TOTAL COSTS

U.S.-FLAG RESULTS
ALASKA/WEST COAST

Page 3 of 5

PORT ITINERARY

1. DOMESTIC
2. FOREIGN
3. DOMESTIC

SERVICE SUMMARY

1. VOYAGE DAYS	13.1 DAYS
2. PORT TIME	3.0 DAYS
3. SEA TIME	10.1 DAYS
4. SEA SPEED	16.5 KNOTS

SHIP SYSTEM COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
1. MORTGAGE/LEASE AMORTIZ.	224,588.74	1.87
2. MORTGAGE INSURANCE	0.00	0.00
3. REQUIRED RETURN ON EQUITY	0.00	0.00
4. MANNING	84,894.55	0.71
5. SUBSISTENCE	2,046.16	0.07
6. FUEL	227,090.91	1.89
7. M+I	11,229.44	0.09
8. SUPPLIES AND EQUIPMENT	3,743.15	0.03
9. P+I INSURANCE	5,240.40	0.04
10. H+M INSURANCE	18,715.73	0.16
TOTAL	577,599.08	4.81

U.S.-FLAG RESULTS
ALASKA/WEST COAST

Page 4 of 5

OTHER VOYAGE COSTS

EXPENSE CATEGORY	COST PER VOYAGE	COST PER TON
1. AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
2. WATERWAY TOLLS AND PILOT FEES	0.00	0.00
3. CORPORATE OVERHEAD	0.00	0.00
TOTAL	0.00	0.00

PORT COSTS

PORT	DOCKAGE	WHARFAGE	MOORING	PILOTS AND TUGS	PORT DUES	CARGO HANDLING	OTHER PORT COSTS	TOTAL	COST PER TON
DOMESTIC	0.00	0.00	0.00	0.00	0.00	0.00	100,000.00	100,000.00	
FOREIGN	0.00	0.00	0.00	0.00	0.00	0.00	40,000.00	40,000.00	
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	140,000.00	140,000.00	1.17

U.S.-FLAG RESULTS
ALASKA/WEST COAST

Page 5 of 5

COST SUMMARY

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
CAPITAL COSTS	224,588.74	1.87	31.3
MANNING AND SURSISTENCE	86,990.71	0.72	12.1
PIRL	227,090.91	1.89	31.6
M+R	11,229.44	0.09	1.6
SUPPLIES AND EQUIPMENT	3,743.15	0.03	0.5
INSURANCE	23,956.13	0.20	3.3
CARGO HANDLING	0.00	0.00	0.0
OTHER PORT COSTS	140,000.00	1.17	19.5
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00	0.0
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
CORPORATE OVERHEAD	0.00	0.00	0.0
TOTAL	717,599.08	5.98	100.0

FOREIGN-FLAG RESULTS
ALASKA-WEST COAST

Page 1 of 1

COST SUMMARY

EXPENSE CATEGORY -----	COST PER VOYAGE -----	COST PER TON -----	PERCENT OF TOTAL -----
CAPITAL COSTS	117,294.37	0.94	20.4
MANNING AND SUBSISTENCE	46,714.46	0.39	8.5
FUEL	227,040.91	1.89	41.2
M-R	7,486.29	0.06	1.4
SUPPLIES AND EQUIPMENT	3,743.15	0.03	0.7
INSURANCE	13,924.50	0.12	2.5
CARGO HANDLING	0.00	0.00	0.0
OTHER PORT COSTS	140,000.00	1.17	25.4
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00	0.0
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
CORPORATE OVERHEAD	0.00	0.00	0.0
TOTAL	551,253.68	4.59	100.0

U.S.-FLAG RESULTS
ALASKA/PANAMA

Page 1 of 1

COST SUMMARY

EXPENSE CATEGORY -----	COST PER VOYAGE -----	COST PER TON -----	PERCENT OF TOTAL -----
CAPITAL COSTS	480,000.00	4.00	33.7
MANNING AND SUBSISTENCE	185,920.00	1.55	13.1
FUEL	535,500.00	4.46	37.6
M+R	24,000.00	0.20	1.7
SUPPLIES AND EQUIPMENT	8,000.00	0.07	0.6
INSURANCE	51,200.00	0.43	3.6
CARGO HANDLING	0.00	0.00	0.0
OTHER PORT COSTS	140,000.00	1.17	9.8
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00	0.0
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
CORPORATE OVERHEAD	0.00	0.00	0.0
	-----	-----	-----
TOTAL	1,424,620.00	11.87	100.0

FOREIGN-FLAG RESULTS

Page 1 of 1

ALASKA/PANAMA

COST SUMMARY

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
CAPITAL COSTS	240,000.00	2.00	22.4
MANNING AND SUBSISTENCE	99,840.00	0.83	9.3
FUEL	535,500.00	4.46	50.1
M-R	16,000.00	0.13	1.5
SUPPLIES AND EQUIPMENT	8,000.00	0.07	0.7
INSURANCE	29,760.00	0.25	2.8
CARGO HANDLING	0.00	0.00	0.0
OTHER PORT COSTS	140,000.00	1.17	13.1
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00	0.0
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
CORPORATE OVERHEAD	0.00	0.00	0.0
TOTAL	1,069,100.00	8.91	100.0

U.S.-FLAG RESULTS
PANAMA/GULF COAST

Page 1 of 1

COST SUMMARY

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
CAPITAL COSTS	51,714.29	1.48	22.7
MANNING AND SUBSISTENCE	66,366.67	1.90	29.2
FUEL	87,583.33	2.50	38.5
M-R	2,298.41	0.07	1.0
SUPPLIES AND EQUIPMENT	5,746.03	0.16	2.5
INSURANCE	11,492.06	0.33	5.0
CARGO HANDLING	0.00	0.00	0.0
OTHER PORT COSTS	2,400.00	0.07	1.1
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00	0.0
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
CORPORATE OVERHEAD	0.00	0.00	0.0
TOTAL	227,600.79	6.50	100.0

FOREIGN-FLAG RESULTS
PANAMA/GULF COAST

Page 1 of 1

COST SUMMARY

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
CAPITAL COSTS	25,857.14	0.74	19.5
MANNING AND SUBSISTENCE	33,786.67	0.97	25.5
FUEL	55,875.00	1.60	42.1
M-R	2,011.11	0.06	1.5
SUPPLIES AND EQUIPMENT	5,746.03	0.16	4.3
INSURANCE	7,067.62	0.20	5.3
CARGO HANDLING	0.00	0.00	0.0
OTHER PORT COSTS	2,400.00	0.07	1.8
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00	0.0
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
CORPORATE OVERHEAD	0.00	0.00	0.0
TOTAL	132,743.57	3.79	100.0

APPENDIX B-5

PRODUCTS TANKER - WEST COAST/ALASKA

U.S.-FLAG RESULTS SUMMARY

Page 1 of 5

SIMAT, NELLISEN AND EICHNER RPR CALCULATOR

SHIP CHARACTERISTICS

<u>ITEM</u>	<u>AMOUNT</u>
S(1) LENGTH	680 FEET
S(2) GRT	20,000 TONS
S(3) CARGO DEADWEIGHT	35,000 TONS
S(4) GRAIN CUBIC	0 CUBIC MTRS
S(5) MACHINERY TYPE	1 *
S(6) DESIGN SPEED	15 KNOTS
S(7) SHP	13,000
S(8) FUEL RATE AT FULL H.P.	70 L.TONS/DAY
S(9) PORT FUEL RATE	10 L.TONS/DAY
S(10) OFFICER COMPLEMENT	0
S(11) CREW COMPLEMENT	30

* 1=STEAM, 2=DIESEL

VOYAGE CHARACTERISTICS

<u>ITEM</u>	<u>AMOUNT</u>
V(1) VOYAGE LENGTH	5,000.0 MILES
V(2) PORT CALLS	10.0
V(3) MILES OF LOW SPEED OPS.	0.0
V(4) AVERAGE SPEED IN LOW SPEED OPS.	0.0 KNOTS
V(5) VOYAGE CANAL TRANSIT COSTS	0.0 DOLLARS

PORT CHARACTERISTICS

<u>PORT</u>	<u>TONS LOADED</u>	<u>TONS DISCHARGED</u>	<u>DAYS IN PORT</u>
DOMESTIC	35,000	0	1.00
FOREIGN	0	35,000	5.00

U.S.-FLAG RESULTSUNIT PORT COSTS

<u>PORT</u>	<u>CARGO LOADING \$/TON</u>	<u>CARGO DISCHARGING \$/TON</u>	<u>DOCKAGE \$/PT-DAY</u>	<u>WHARFAGE \$/CARGO TON</u>	<u>MOORING \$/PORT CALL</u>	<u>PILOTS & TUGS \$/PORT CALL</u>	<u>PORT DUES \$/GRT</u>	<u>OTHER PORT COSTS \$/CALL</u>
DOMESTIC	0.00	0.00	0.00	0.00	0.00	10000.00	0.000	0.00
FOREIGN	0.00	0.00	0.00	0.00	0.00	10000.00	0.000	0.00

VESSEL SYSTEM COSTS

<u>ITEM</u>	<u>AMOUNT</u>
VC(1) MORTGAGE/LEASE PAYOFF	900,000 DOLLARS/VESSEL YEAR
VC(2) MORTGAGE INSURANCE	900,000 DOLLARS/VESSEL YEAR
VC(6) CREW COST	75,000 DOLLARS/MAN YEAR
VC(7) SUBSISTENCE	2,000 DOLLARS/MAN YEAR
VC(8) FUEL COST	150 DOLLARS/L.TON
VC(9) M+R	80,000 DOLLARS/SHIP YEAR
VC(10) SUPPLIES, EQUIP., STORES	200,000 DOLLARS/SHIP YEAR
VC(11) P+I INSURANCE	5,000 DOLLARS/MAN YEAR
VC(12) H+M INSURANCE	250,000 DOLLARS/SHIP YEAR

ADMINISTRATIVE COSTS

<u>ITEM</u>	<u>AMOUNT</u>
CA(1) AGENCY, BROKERAGE, AND COMMISSIONS	0.00 \$/TON
CA(2) CORPORATE OVERHEAD	0.00 PERCENT OF TOTAL COSTS

U.S.-FLAG RESULTS**PORT ITINERARY**

1. DOMESTIC
2. FOREIGN
3. DOMESTIC

SERVICE SUMMARY

1. VOYAGE DAYS	19.9 DAYS
2. PORT TIME	6.0 DAYS
3. SEA TIME	13.9 DAYS
4. SEA SPEED	15.0 KNOTS

SHIP SYSTEM COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
1. MORTGAGE/LEASE AMORTIZ.	51,142.86	1.46
2. MORTGAGE INSURANCE	51,142.86	1.46
3. REQUIRED RETURN ON EQUITY	0.00	0.00
4. MANNING	127,857.14	3.65
5. SURSISTENCE	3,409.52	0.10
6. FUEL	154,833.33	4.42
7. M+R	4,546.03	0.13
8. SUPPLIES AND EQUIPMENT	11,365.08	0.32
9. P+I INSURANCE	8,523.81	0.24
10. H+M INSURANCE	14,206.35	0.41
TOTAL	427,026.98	12.20

U.S.-FLAG RESULTSOTHER VOYAGE COSTS

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>
1. AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00
2. WATERWAY TOLLS AND PILOT FEES	0.00	0.00
3. CORPORATE OVERHEAD	0.00	0.00
TOTAL	0.00	0.00

PORT COSTS

<u>PORT</u>	<u>DOCKAGE</u>	<u>WHARFAGE</u>	<u>MOORING</u>	<u>PILOTS AND TUGS</u>	<u>PORT DUES</u>	<u>CARGO HANDLING</u>	<u>OTHER PORT COSTS</u>	<u>TOTAL</u>	<u>COST PER TON</u>
DOMESTIC	0.00	0.00	0.00	10,800.00	0.00	0.00	0.00	10,800.00	
FOREIGN	0.00	0.00	0.00	10,800.00	0.00	0.00	0.00	10,800.00	
TOTAL	0.00	0.00	0.00	21,600.00	0.00	0.00	0.00	21,600.00	0.62

U.S.-FLAG RESULTS

Page 5 of 5

COST SUMMARY

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
CAPITAL COSTS	102,285.71	2.92	22.8
MANNING AND SURSISTENCE	131,266.67	3.75	29.3
FUEL	154,833.33	4.42	34.5
M+R	4,546.03	0.13	1.0
SUPPLIES AND EQUIPMENT	11,365.08	0.32	2.5
INSURANCE	22,730.16	0.65	5.1
CARGO HANDLING	0.00	0.00	0.0
OTHER PORT COSTS	21,600.00	0.62	4.8
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00	0.0
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
CORPORATE OVERHEAD	0.00	0.00	0.0
TOTAL	448,626.98	12.82	100.0

FOREIGN-FLAG RESULTS

Page 1 of 1

COST SUMMARY

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
CAPITAL COSTS	51,142.86	1.46	19.9
MANNING AND SUBSISTENCE	66,826.67	1.91	25.9
FUEL	98,250.00	2.41	38.1
MOR	3,977.78	0.11	1.5
SUPPLIES AND EQUIPMENT	11,365.08	0.32	4.4
INSURANCE	13,979.05	0.40	5.4
CARGO HANDLING	0.00	0.00	0.0
OTHER PORT COSTS	12,000.00	0.34	4.7
AGENCY, BROKERAGE, AND COMMISSION	0.00	0.00	0.0
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
CORPORATE OVERHEAD	0.00	0.00	0.0
TOTAL	257,541.43	7.36	100.0

APPENDIX B-6
FOREST PRODUCT CARRIER -
ALASKA/WEST COAST

FOREIGN-FLAG RESULTS

Page 1 of 3

SIYAT, HELLERSEN AND EICHNER IPR CALCULATOR

SHIP CHARACTERISTICS

<u>ITEM</u>	<u>AMOUNT</u>
SI 1) LENGTH	564 FEET
SI 2) GRT	19,165 TONS
SI 3) CARGO DEADWEIGHT	29,240 TONS
SI 4) GRAIN CUBIC	35,670 CUBIC METERS
SI 5) MACHINERY TYPE	2 *
SI 6) DESIGN SPEED	16 KNOTS
SI 7) SHIP	13,040
SI 8) FUEL RATE AT FULL R.P.	44 L.TONS/DAY
SI 9) PORT FUEL RATE	3 L.TONS/DAY
SI 10) CREW COMPLIMENT	27

VOYAGE CHARACTERISTICS

<u>ITEM</u>	<u>AMOUNT</u>
VI 1) SERVICE FREQUENCY	0.0 DAYS BETWEEN CALLS
VI 2) ROUND TRIP VOYAGE LENGTH	1,200.0 MILES
VI 3) PREFERRED R.T. VOYAGE TIME	0.0 DAYS
VI 4) NUMBER OF FOREIGN PORT CALLS	1.0
VI 5) NUMBER OF DOMESTIC PORT CALLS	1.0
VI 6) ONE WAY MILES OF LOW SPEED OPS.	0.0
VI 7) AVERAGE SPEED IN LOW SPEED OPS.	0.0 KNOTS
VI 8) VOYAGE CANAL TRANSIT COSTS	0.0 DOLLARS
VI 9) NUMBER OF VESSELS IN FLEET	1.0

* 1=STEAM, 2=DIESEL

PORT CHARACTERISTICS

<u>PORT</u>	<u>TONS LOADED</u>	<u>TONS DISCHARGED</u>	<u>DAYS IN PORT</u>
FOREIGN	0	27,000	2.00
DOMESTIC	27,000	0	2.00

FOREIGN-FLAG RESULTS

Page 2 of 3

UNIT PORT COSTS

PORT	CARGO LOADING \$/TON	CARGO DISCHARGING \$/TON	OTHER CARGO HANDLING \$/TON	PORT COSTS \$/PORT CALL
FOREIGN	0.00	3.25	0.15	15,000.00
DOMESTIC	3.50	0.00	0.40	15,000.00

VESSEL SYSTEM COSTS

ITEM	AMOUNT
VC11) DEPRECIATION	300,000 DOLLARS/VESSEL YEAR
VC12) INTEREST	367,000 DOLLARS/VESSEL YEAR
VC14) CHRY COST	25,000 DOLLARS/NAV YEAR
VC15) SUSTINENCE	1,000 DOLLARS/NAV YEAR
VC16) PI&L CUST	150 DOLLARS/L.TON
VC17) M+N	300,000 DOLLARS/SHIP YEAR
VC18) SUPPLIES, EQUIP., STORES	350,000 DOLLARS/SHIP YEAR
VC110) M+N INSURANCE	175,000 DOLLARS/SHIP YEAR

ADMINISTRATIVE COSTS

ITEM	AMOUNT
CA11) AGENCY, BROKERAGE, AND COMMISSIONS (DOMESTIC)	0.70 \$/TON
CA12) AGENCY, BROKERAGE, AND COMMISSIONS (FOREIGN)	0.70 \$/TON
CA13) CORPORATE OVERHEAD	10.40 PERCENT OF GROSS COSTS

FOREIGN-FLAG RESULTS

Page 3 of 3

COST SUMMARY

EXPENSE CATEGORY	COST PER VOYAGE	COST PER TON	PERCENT OF TOTAL
MANNING AND SUBSISTENCE	16,045.71	0.59	4.5
FUEL	17,036.11	0.66	5.1
M-R	6,857.14	0.25	1.9
SUPPLIES AND EQUIPMENT	8,000.00	0.30	2.3
INSURANCE	4,000.00	0.15	1.1
CAPITAL COSTS	15,264.00	0.57	4.3
STEVEDORING COSTS	182,250.00	6.75	51.6
OTHER CARGO HANDLING COSTS	14,050.00	0.55	4.2
PORT COSTS	30,000.00	1.11	8.5
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
AGENCY, BROKERAGE, AND COMMISSION	21,060.00	0.78	6.0
CORPORATE OVERHEAD	36,697.49	1.36	10.4
TOTAL	352,860.46	13.07	100.0
LESS OPERATING SUBSIDY	(0.00)	(0.00)	(0.0)
NET TOTAL	352,860.46	13.07	100.0

U.S.-FLAG RESULTS SUMMARY

Page 1 of 1

COST SUMMARY

<u>EXPENSE CATEGORY</u>	<u>COST PER VOYAGE</u>	<u>COST PER TON</u>	<u>PERCENT OF TOTAL</u>
MANNING AND SUBSISTENCE	55,500.57	2.06	12.5
FUEL	33,497.22	1.24	7.5
M-R	6,857.14	0.25	1.5
SUPPLIES AND EQUIPMENT	8,000.00	0.30	1.8
INSURANCE	16,000.00	0.59	3.6
CAPITAL COSTS	30,491.43	1.13	6.9
STEVEDORING COSTS	102,250.00	6.75	41.0
OTHER CARGO HANDLING COSTS	14,850.00	0.55	3.3
PORT COSTS	30,000.00	1.11	6.7
WATERWAY TOLLS AND PILOT FEES	0.00	0.00	0.0
AGENCY, BROKERAGE, AND COMMISSION	21,060.00	0.78	4.7
CORPORATE OVERHEAD	46,265.42	1.71	10.4
TOTAL	444,859.78	16.48	100.0
LESS OPERATING SUBSIDY	(0.00)	(0.00)	(0.0)
NET TOTAL	444,859.78	16.48	100.0

APPENDIX C
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ALASKA'S ECONOMY AND THE MERCHANT MARINE ACT OF 1920
(The Jones Act)

A Follow-Up and Review of
The Jones Act and its Impact on the State of Alaska
By Simat, Helleisen & Eichner, Inc.
For the Alaska Statehood Commission

20 September, 1982

Arion R. Tuning and Associates, Inc. (ARTA)
Juneau - Seattle - Anchorage

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CONTENTS

Executive Summary (Principal Findings)	1
The Jones Act and Shipping Costs (General)	5
The Impact of the Jones Act on Alaska	9
Alaska Crude-Oil Economics: The Jones Act and the Oil-Export Ban	21
Historical Perspective on the Jones Act (Boom and Bust in the US Merchant Marine)	33

TABLES

Untitled (comparison of capital costs for Jones Act and Foreign-Flag Vessels, from SH&E)	5
Untitled (comparison of manning and sub sistence costs for Jones Act and Foreign-Flag Vessels, from SH&E)	5
Table 1. Indicators of United States Shipbuilding Activity, 1914-79	34
Table 2. The US Merchant Marine Booms and Busts --- Twice	35

APPENDIX

West Coast Oil Prices	41
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EXECUTIVE SUMMARY **(Principal Findings)**

This paper was prepared by Arlon R. Tussing and Associates, Inc. (ARTA) for the Alaska Statehood Commission as a follow-up, review, and interpretation of the analysis and findings contained in The Jones Act and its Impact on the State of Alaska, by Simat, Helleisen & Eichner, Inc. (SH&E). The following are among the most important inferences that readers can draw from the SH&E study and from this review.

1. The "cabotage" laws of the United States, of which the Jones Act is the keystone, impose substantial costs on the US economy, in the form of higher oceanborne freight charges, and the diversion of cargo to more expensive transportation modes.

These costs of the cabotage laws are imposed disproportionately on Alaska. The state's physical separation from the other states makes it depend disproportionately on ocean transport for its interstate commerce. In addition, Alaska's large size and primitive land-transportation network make it depend disproportionately on ocean transportation for its intrastate commerce.

2. Because Alaska's economy is small and distant from major markets, the Jones Act creates a DOUBLE cost penalty for Alaskans. The state is generally a price-taker for both its imports and its exports; thus, the Jones Act adds to the prices of Alaska's imports and subtracts from the prices of the state's exports.

3. The "Jones Act penalty" (the additional cost of using US-built, US-owned, US-registered, and US-manned vessels in place of the lowest-cost transportation) tends to be greatest for commodities having a low ratio of value to weight or to volume.

The cost to Alaska from the Jones Act penalty on the outbound shipment of crude oil probably overshadows all other costs of the Act. SH&E's analysis implies that the law currently reduces the wellhead value of Alaska crude oil by about \$225 million per year. Consideration of the worldwide

surplus of foreign-flag tankers raises this penalty to about \$310 million per year. Taking account of current trends in West Coast oil-price formation increases the potential penalty at the wellhead to \$630 million per year.

The state government's share of increased (or decreased) wellhead revenue is now about 28 percent. This approach yields a direct revenue cost of the Jones Act to Alaska's treasury in the range of \$63 to \$176 million per year.

5. The IMMEDIATE effect of removing either the Jones Act requirements or export restrictions on Alaska crude-oil shipments would probably be minor: The North Slope crude-oil producers have already invested in Jones Act tankers and have made throughput commitments to an oil pipeline across Panama. Also, the incentive of Alaska crude-oil producers to seek transportation-cost reductions is weak, because the combination of royalties and severance taxes, "windfall-profits tax", and federal and state income taxes leaves the producers less than 10 percent of any increase in wellhead prices stemming from lower ocean-transport costs.

Some latitude would remain for non-producers purchasing "in-kind" royalty oil from the state to use lower-cost shipping services.

4. The prohibition on exporting Alaska crude oil depresses its "netback" price (and thereby state oil revenues) more than does the Jones Act; repeal of the prohibition would make the Jones Act nearly moot with respect to crude-oil prices.

Alaska's Congressional delegation might therefore employ its political efforts most effectively in trying to block extension of the oil export prohibitions of the Export Administration Act (which expire in 1983), rather than in mounting new legislation to repeal some of the present Jones Act provisions.

6. The direct cost of the Jones Act to Alaska's PRESENT export industries other than petroleum is probably small. Some of these industries tend to be oriented to overseas markets where the Jones Act is irrelevant. Others can take advantage of low-cost Southbound "backhaul" rates unrelated to the nationality of the vessel.

7. The direct cost of the Jones Act on Alaska's general-merchandise imports is impossible to measure with confidence, but it is probably minor. There is vigorous intermodal competition on routes between the Northwest and Alaska's "Railbelt" (which contains most of the state's population and economic activity).

Transportation costs to and between Alaska ports other than those serving the Railbelt are mostly a function of the small scale and sporadic character of shipments, rather than the nationality of shipping or vessels. A number of methods by which shippers could circumvent Jones Act cost penalties are virtually unexploited; this situation supports the inference that these penalties are insignificant.

8. The largest adverse effects of the Jones Act for Alaska are likely to be IN THE FUTURE, as transportation costs for crude-oil and other minerals can be an important factor determining the economic feasibility of developing specific deposits. Transportation costs between Alaska and the Lower 48 that are higher than those between Alaska and foreign countries also strengthen the tendency of Alaska's resource-industry markets and sources of investment capital to be in the Far East rather than the Lower 48.

9. The most promising Alaska strategy to modify the Jones Act would aim at: obtaining the support of US maritime unions and shipping companies (or at least their neutrality) for allowing foreign-owned and foreign-built ships to operate in the "coastwise" trade, while retaining US labor, safety, and environmental standards.

One basis for this strategy might be the thesis that allowing foreign-built ships in the coastwise trade would increase employment in the US merchant marine. The Jones Act has probably contributed to the virtual disappearance of the US coastwise shipping industry (except for shipments of petroleum by tanker, and service linking Alaska and Hawaii with the mainland).

A first tactic in such a strategy would be for the state to commission a study of the effect of the US-tanker requirement in the Jones Act on US merchant-marine employment.

The SH&E report. The SH&E report is well written, comprehensive, and insightful, and contains little with which ARTA have substantive disagreements. Its quantitative (dollar-denominated) findings about the economic effects of the Jones Act in Alaska suffer from the same disabilities that beset almost every "counterfactual" analysis --- every study that attempts to describe the world that would exist "if only" some circumstance or set of circumstances were different from present reality.

In any analysis of this sort, the investigators have almost infinite discretion in choosing assumptions about which factors to hold constant, and how far to trace the indirect effects of the assumed change. Thus, ARTA probably would have made different assumptions from those employed by SH&E, and emphasized different factors, but we do not thereby mean to fault the SH&E team for the assumptions and methodology they selected. Our object here has been to organize, integrate, and present essentially the same insights as the SH&E report in a way which, we hope, is more directly focused on Alaska's policy choices.

THE JONES ACT AND SHIPPING COSTS: GENERAL

The Merchant Marine Acts of 1920 ("The Jones Act") and 1936 restrict the nation's "coastwise trade" (waterborne commerce between United States ports) to ships (1) built in the United States, (2) manned by US nationals, (3) owned by US nationals, and (4) registered in the US. The following effects of these "cabotage" laws tend to raise the cost of domestic water transportation:

1. Ship-construction costs are relatively high in the United States because of high shipyard labor costs and low labor productivity. SH&E show capital costs for US-flag vessels that are about twice those of their foreign-flag counterparts:

Service	Capital Costs per Ton (Depreciation & Interest)		
	US- Flag	Foreign- Flag	Ratio
VLCC tanker, Valdez-Los Angeles	\$ 1.87	\$0.94	1.98
VLCC tanker, Valdez-Panama	4.00	2.00	2.00
Handy-size tanker, Panama-US Gulf	1.48	.74	2.00
Oil-product tanker, Los Angeles-Valdez	2.92	1.46	2.00
Bulk carrier, Ketchikan-Seattle	1.13	.57	1.98
Containership, Seattle-Alaska	66.60	33.18	2.01
RoRo, Seattle-Alaska	119.01	59.50	2.00
Barge service, Seattle-Alaska	178.34	101.91	1.75

Shipbuilding is a labor-intensive industry that uses a workforce made up primarily of skilled and semi-skilled workers. As a result, the countries that have the greatest comparative advantage in shipbuilding tend to be "low-income developed countries". These are countries with a skilled and disciplined labor force, a moderately high level of technical sophistication, and an effective industrial infrastructure, together with comparatively low wages.

In the early Nineteenth Century, the United States was such a low-income developed country and competed with England for first rank among maritime powers; a similar economic position gave Japan the world lead in shipbuilding during the 1950s and 1960s. More recently Poland, Spain, Portugal, Taiwan, Korea, and Ireland have been able to undersell shipyards in the United States, Japan, and other high-income developed countries.

The comparative disadvantage that a country's high labor costs impart to shipbuilding is not absolute, however. High labor productivity and standards of workmanship have allowed some Scandinavian yards to remain competitive in specialized kinds of shipbuilding despite their high wages. Finland, for example, appears to be the world's leader in icebreaker construction.

Higher capital costs also contribute to higher insurance costs.

2. The United States merchant marine is unionized and US seamen receive exceedingly high wages by world standards. SH&E show manning costs for US-flag vessels that are about twice those of their foreign-flag counterparts:

Service	Labor Costs per Ton (Manning & Subsistence)		
	US- Flag	Foreign- Flag	Ratio
VLCC tanker, Valdez-Los Angeles	\$ 0.72	\$0.39	1.85
VLCC tanker, Valdez-Panama	1.55	0.83	1.88
Handy-size tanker, Panama-US Gulf	1.90	.97	1.96
Oil-product tanker, Los Angeles-Valdez	3.75	1.91	1.96
Bulk carrier, Ketchikan-Seattle	2.06	.99	3.49
Containership, Seattle-Alaska	151.90	88.26	1.72
RoRo, Seattle-Alaska	90.81	52.76	1.50
Barge Service, Seattle-Alaska	99.62	42.80	1.39

Foreign vessels are able to recruit crews from the whole world;

and a seaman's wage one-fifth of the US wage would nevertheless be several times higher than the amount most Pakistani, Somali, or Haitian nationals could earn at home.

3. Ships registered in the United States are subject to comparatively strict standards regarding working conditions, seamen's rights, safety, environmental protection, and insurance. These requirements increase US-flag costs relative to ships operating under "flags of convenience"; i.e., registered in countries like Panama and Liberia chosen expressly because of their more lenient regulations.

4. Ships owned by United States nationals are subject to relatively high levels of taxation. Taxes on ships operating in international trade are lower or non-existent in the flag-of-convenience nations.

5. The absence of foreign-built, foreign-owned, foreign-registered, and foreign-manned vessels from the US coastwise trade limits competition. The fact that US shippers can not draw from the whole world's population of ships and ship operators would tend to keep domestic shipping rates higher even if the US otherwise had relatively low ship-construction and operating costs.

Protection of domestic shipping (1) reduces the incentives for US shipbuilders and shipyard workers to increase productivity and trim costs; (2) increases the influence of maritime unions relative to shipowners and shippers; (3) softens the resistance of shipowners to strict regulation concerning safety and working-conditions, environmental-protection, and liability for accidents, pollution, etc., and (4) makes it easier for operators to cooperate in setting rates.

6. The strict separation of domestic and foreign waterborne commerce prevents operators from optimizing routes and utilization of vessel capacity.

In general, ships can not carry both domestic and international cargoes on the same trip --- the vessel is either legally excluded from one kind of service or priced out of the other. For example, in order to use a ship most efficiently on each leg of a liner voyage between California and the Orient, a vessel might begin by loading at Long Beach, offloading some cargo in Puget Sound and picking up additional cargo there, offloading at Anchorage, picking up fish at Dutch Harbor; and continuing on the Great Circle route to Yokohama, Taipei, and Singapore. The return voyage might be directly to Puget Sound and/or California, bypassing Alaska ports because of the lack of southbound cargoes.

By precluding such triangular or circular trades, the Jones Act condemns both the coastwise and international trade to the higher costs of empty or underutilized "backhaul" voyages, on any route (e.g., Puget Sound/Anchorage) where a directional imbalance exists.

THE IMPACT OF THE JONES ACT ON ALASKA

The Jones Act Cost Penalty. The Merchant Marine Act of 1920 ("The Jones Act") restricts the "coastwise" waterborne transportation of the United States, including transportation between Alaska and Lower-48 ports and transportation within Alaska, to vessels that are US-built, US-owned, US-registered, and manned by US nationals. Detached from the other states on the extreme Northwest corner of North America, Alaska depends disproportionately on ocean transportation for its economic links with the rest of the nation. The Jones Act has long been a point of contention between Alaskans and other Americans --- it was one of the grievances that motivated Alaska's struggle against "colonialism" and the desire to become a State; 24 years after Statehood some Alaskans still regard the law as a symbol of their state's second-class membership in the American union.

Whatever transportation-cost penalty the Jones Act carries is imposed disproportionately on the Alaska economy. In general, the relatively small size of Alaska's economy makes it a "price-taker" in national and international markets. That is, both the prices of goods exported from Alaska and those of goods imported into the state tend to be set in larger markets outside its borders. Higher transport costs are thus added to the cost of Alaska's imports, and subtracted from the market prices of her exports.

The value of crude oil at Valdez, for example, is a "netback" value that reflects the cost of similar grades of crude oil at Lower-48 refineries, less transportation charges from Valdez to the refinery. Most other commodities produced in Alaska will be valued in the same fashion. Likewise, the prices of most consumer goods in Anchorage are composed of a price determined in some outside market, plus the

transportation cost from that market to Anchorage (and, of course, local distribution markups).

Alaska's position as a price-taker means that its economy tends to suffer a double penalty from any adverse transport-cost differential. In general, the state's exports to Lower-48 markets will have lower prices at their point of origin than would otherwise have been the case. The most obvious impact of this kind is on the state government's natural-resource royalties and severance taxes, which are keyed to netback prices. Private (e.g., Native-corporation) resource leasing and sales income would be affected by transportation costs in the same way.

An even more important effect of higher transport costs in the long run may be to shift economic margins: Investors might view a certain natural-resource venture (a new oil discovery, for example, or a copper mine) to be economic if the netback value of the crude oil or ore reflected foreign-flag shipping costs, but as uneconomic if the wellhead or mine-mouth return had to absorb US-flag shipping rates. Higher import costs for capital goods and for supplies used by industry may also help shift economic margins, making otherwise economic ventures unattractive to investors.

There is little doubt, therefore, that Alaskans are relatively worse-off because of the Jones Act. The state is not now and is not likely to become a major shipbuilding area; there are few maritime-industry jobs based in Alaska that would not also exist under a more liberal regime. (Indeed, relaxation of the requirement that the coast-wise trade be carried in US-built vessels would undoubtedly result in a greater number of jobs for domestic workers; we take up this point elsewhere in the present review.) Except for some arguable national-defense benefits, therefore, it is hard to conceive of any benefit to Alaska from the cabotage laws.

It is a great leap, however, from (1) concluding that the Jones Act affects Alaskans adversely, (2) to determining which adverse effects are really significant, and (3) from there attaching numbers to these impacts. One step in such an analysis is, of course, a comparison of "required freight rates" (RFR) per unit of cargo for Jones Act vs foreign-flag carriers, as SH&E has conducted. We find no fault in these exercises as they are presented in the SH&E report.

(The RFR is the minimum rate that will cover the vessel's operating costs, amortize its original capital cost over its economic life, and provide a market rate of return on the unamortized capital. In a period of surplus capacity, like the present with respect to foreign-flag oil tankers, actual spot (single-voyage) or time-charter rates may in fact fall below RFR to a level where they cover only variable or "running" costs. Conversely, in a tight market actual rates are likely to be considerably above RFR.)

Although the Jones Act's economic effects are overwhelmingly negative for Alaska, there are few markets or aspects of Alaska's economy for which removal of the Jones Act strictures would make much immediate difference. Except for the Railbelt area (Anchorage, Seward and Whittier, north through the Matanuska Valley to Fairbanks), the cost of ocean transportation is dominated by its seasonality or sporadic character, by the small scale of shipments, and by directional imbalance. For much of Alaska, it is not likely that the potential of competition from foreign-flag carriers would have much impact on costs.

The Railbelt, where most of Alaska's ocean-transportation demand originates, is served by a variety of shipping companies and modes of transportation. For the general mixed-merchandise trade in consumer goods and miscellaneous industrial supplies and building materials,

the transportation business is highly competitive and continually changing. Containerized and roll-on/roll-off trailers seem to be the most efficient mode for most of this business and, as SH&E show, their costs are not strongly related to the nationality of the operations (page 41). Differences in the efficiency of shore-based activities can easily cancel out any difference in capital and manning costs between U.S.-flag and foreign-flag operations. Adding foreign-flag shipping companies to the present mix would in principle strengthen competition, but the true impact is hard to pin down.

The biggest cost impacts of the cabotage laws will be on commodities with low ratios of value to weight or bulk, where there is little practical alternative to oceanborne transportation. Crude oil is of course the outstanding example, and is Alaska's chief export commodity. Other Alaska bulk commodities --- ores, for example, may be seriously affected at some time in the future by the Jones Act cost penalty. Because of the myriad way in which producers, consumers, and investors can adjust to cost differentials, however, the actual impact of the Jones Act will be quite different from the raw comparison of the required freight rates (RFRs) for identical commodities on identical routes in Jones Act and foreign vessels. Several of these differences are worth noting in detail.

Firstly, there are exceptions to the general rule that Alaska is a price-taker in its sales and a price-taker in its purchases. From 1973 to 1980, for example, Alaska-produced crude oil was subject to federal price ceilings at the wellhead. As a result, Lower-48 refinery prices for that oil were cost-plus prices, reflecting the regulated wellhead price plus transportation costs. (North Slope crude oil, however, was actually priced on a netback basis from 1977 through mid-1979 notwithstanding

federal price controls, because the federal ceilings were higher than the market value of the oil.)

Sponsors of projects to deliver Alaska natural gas to the Lower-48, including the El Paso Alaska and PAC-Alaska LNG (liquefied natural gas) schemes as well as the Alaska Highway gas pipeline, have planned for Lower-48 pricing of Alaska natural gas on a cost-plus basis, composed of the sum of a regulated wellhead price and pipeline and/or LNG-tanker costs. These expectations would have been realistic, however, only if there had been a permanent gas shortage in the Lower 48. Under all foreseeable market conditions today, however, a cost-plus price would make Alaska gas unmarketable in the Lower 48.

It is interesting to note that the El Paso Company acknowledged that the need to use Jones Act LNG tankers would have made its proposal to ship North Slope LNG from Prince William Sound to California uneconomic even under the gas-market assumptions that prevailed in 1976, unless the project were able to obtain federal ship-construction subsidies and/or loan-guarantees.

The pricing of petroleum products refined in Alaska is another exception to the rule that the Jones Act means higher prices for Alaska consumer goods. High transportation costs for crude oil exported from Alaska result in lower crude-oil costs for Alaska refiners, and at least potentially, lower petroleum-product prices for Alaska consumers, because the local refiners need only match the price of North Slope crude oil in outside markets less transportation --- as opposed to the combination of Lower-48 prices plus transportation that governs the Alaska prices of most consumer goods.

Those petroleum products produced by two or three of the Alaska refineries (jet fuel and distillate fuel oil) tend to sell in Alaska for less than West Coast prices, while motor gasoline (produced only by Tesoro)

sells at somewhat more than the Los Angeles price, but at less than the Los Angeles price plus transportation costs. For this reason, we doubt whether there is actually a "US-flag premium of \$5.46 per long ton on petroleum products shipped north from Los Angeles." (SH&E, page 54) It is likely that California refiners absorb most or all of this premium --- indeed, it is not clear that Alaska consumers actually bear all of the Northbound transport costs.

There are other instances in which sellers or buyers outside of Alaska may have to absorb all or some of the additional costs imposed by higher freight rates. To the extent that the lowest-cost source of some Alaska import (for example, structural steel or steel pipe from Japan) is not burdened with a Jones Act shipping-cost penalty, competing Lower-48 suppliers may have to absorb whatever additional Jones Act penalty their product bears if they hope to do business in the state. In some cases, they may be willing to accept a lower price, in others they may not.

Likewise, US buyers seeking an Alaska product whose principal outlet is a foreign country must meet the Alaska export price and, in addition, bear whatever additional transport cost is involved. This situation probably applies to occasional shipments of Southeast Alaska logs or lumber to the Lower 48; thus the SH&E report may be in error when it attributes a \$3.41-per-ton Jones Act penalty on Southbound exports of Alaska lumber (p 54). The same situation likely applies to shipments of fresh and frozen king and chum salmon from the Bristol Bay area --- their prices are most likely determined by the offers of Japanese fish-buyers; Lower-48 buyers are price-takers and must absorb whatever the transportation costs to the Lower 48 may be.

Secondly, shippers can avoid the full impact of any Jones Act penalty by using a different transport mode or different routing; and

the new arrangement may or may not involve Jones Act shipping. For example, SH&E refer to exceptions or "provisos" in the Jones Act which constitute potential loopholes in its coverage (pp 4-8). The most important exception is probably the ability to use foreign vessels in the coastwise trade, if the group of carriers, which must include a Canadian railroad, files a through tariff with the Interstate Commerce Commission. Hydrotrain formerly used this exception to ship rail barges from New Westminster, BC to Whittier. Similar arrangements could be imagined involving piggyback trailers carried by rail to Canada, where they would be loaded on Ro/Ro (roll-on/roll-off) or container vessels.

Alternately, the level and structure of Jones Act charges might shift some cargoes from self-propelled Jones Act ships to Jones Act tug-and-barge combinations; and other cargoes from ships to highway transportation; and still others to mixed modes (e.g., by highway to Prince Rupert and thence by Alaska state ferries to Southeast Alaska ports rather than by sea all the way).

Still another pattern exists in the Southeast Alaska tourship industry. In order to use foreign-built, foreign-flag, and foreign-crew vessels in Alaska tourship operations, the operators simply base their operations abroad, and pretend that no passenger both embarks and disembarks in the United States. Numerous passengers do, indeed, join a tour at (say) Seattle, and leave it at (say) Skagway, but no one evidently interferes, in the (probably accurate) perception that if the Jones Act were enforced in this case, there would be no tourships.

Thirdly, Jones Act transport-cost penalties can induce Alaska buyers to shift supply sources. For example, Japan is a net exporter of both steel and automobiles to the United States. Because Alaska is located between US and Japanese producing areas, the state can be expected to import a somewhat larger share of its steel and motor

vehicles from Japan than do other areas of the United States having lower shipping costs from US factories and higher shipping costs from Japan. This would be the case even in the absence of a Jones Act transportation-cost burden on shipments from the United States, because Alaska is further from US producing areas and closer to Japan. The Jones Act penalty on shipments of steel and automobiles from the United States to Alaska would, however, tend to shift the Alaska market balance even further in favor of Japanese goods.

The tendency for shipping costs to alter the choice of supply sources could be readily tested and measured for motor vehicles, on the basis of published statistics on sales and average prices by state and make. If Japanese automobiles are in fact imported directly into Alaska rather than transshipped through Seattle (a factual question we have not investigated), we could compute the Jones Act transportation-cost penalty on motor vehicles with some confidence. With a little ingenuity, the same data could be translated into lost sales by US auto manufacturers and lost jobs for US auto workers. (Unfortunately, the Alaska market is probably too small for such an analysis to have much influence on the position of the United Auto Workers with respect to the Jones Act.)

Researchers could do a similar analysis of the Jones Act's influence on Alaska steel-purchasing patterns, but the necessary data are much more complex and difficult to obtain. Such an analysis would probably be worth while, however, for very large projects using large amounts of steel. For example, was the Jones Act an element in Alyeska's decision to use Japanese-made pipe on the Trans-Alaska oil pipeline (TAPS)? If so, the state's advocates and allies on this issue could counterpose the employment cost of the Jones Act to US

steelworkers against its benefits (if any) to shipyard and maritime workers.

If such an analysis showed that motor-vehicle, industrial-machinery, or steel-purchase decisions in Alaska are indeed sensitive to ocean-transport costs, Alaska might effectively argue for an amendment to the law providing that ---

The Secretary of Commerce may authorize the use of foreign-flag vessels in transport of US-produced commodities to or between Alaska ports if he finds that requiring the use of Jones Act vessels will result in a loss of sales by the US producers of those commodities.

Buying Canadian-made goods is another way in which Alaskans can, at least in principle, circumvent the Jones Act. British Columbia is a net exporter of lumber and newsprint to the United States; thus Canadian prices of these commodities, plus duty, are unlikely to be higher than U.S. prices. It is likely, indeed, that most of the newsprint consumed in Alaska now comes from British Columbia by way of Seattle. Alaska buyers ought to be able to save at least as much on these commodities as the unit difference between US-flag and foreign-flag cargo rates by importing them from Canada rather than from the West Coast of the United States. Similar relationships may exist for Portland cement and other low value-to-weight or value-to-bulk commodities.

The import of motor vehicles from Canada might be a similar opportunity for avoiding Jones Act transportation-cost penalties. The United States and Canada have an agreement to treat the automobile and auto-parts manufacturing industry of the two countries as a single industry. "American" cars bought in the US may well have been manufactured in Canada or vice versa; cross-border sales do not bear

import duties. Thus, "American" motor vehicles made in Canada could be shipped from Vancouver to Alaska in foreign-flag carriers without running afoul of the Jones Act.

Any assessment of the feasibility of arrangements of this type would have to take account of (1) import duties and non-tariff import limitations, (2) economies of scale, and (3) the effect of directionally imbalanced trade. For example, is the Alaska Railbelt's motor-vehicle market large enough to support direct deliveries from Japan or Canada by specialized automobile carriers? And how much, if any, influence does the Jones Act have on outbound or ("backhaul") cargoes of fish, wood products, or other merchandise in view of the excess capacity that exists for southbound water, air and highway shipping?

Nevertheless, the fact that few shippers now seem to take advantage of either (1) their ability to bypass the Jones Act with purchases in Canada or (2) the exception for through shipments over Canadian railroads (and particularly the failure of a British Columbia to Whittier rail-barge service) leads us to a rebuttable presumption that the effective burden of the Jones Act on the Railbelt's general-merchandise imports is not great.

Fourthly, Alaska exports could be redirected away from US markets, where their transportation is burdened by the Jones Act cost penalty, to foreign markets that can be served by foreign-flag carriers. Even without a Jones Act cost differential, the Far East is an important market for Alaska natural-resource products. About three-fourths of Alaska's forest products, and about one-fifth of its seafood products (measured by wholesale value vs the FOB value of exports) are exported; these exports are principally to the Far East. If an Alaska coal-export industry develops, it will surely serve the Far East rather than the Lower-48. Some metallic and non-metallic mining industries,

likewise, would be directed at markets in Japan, Korea, Taiwan, etc. The fact that the Western US and Canada are both exporters of coal, wood products, non-ferrous metal ores and concentrates, and other non-fuel minerals to East Asia is almost conclusive evidence that additional Alaska exports would tend to go East rather than South, even without the Jones Act.

Alaska's single existing petrochemical plant was built to serve the Japanese market, and if further natural-gas or natural-gas-liquids-based petrochemical plants are built in Alaska, a part of their output would surely go to Far Eastern markets. The state's present production of LNG is exported to Japan, and if any prospect exists for further LNG shipments from Alaska, it would almost certainly be an East Asian market, in view of the emerging natural-gas surplus throughout North America.

If Alaska's natural-resource-based industries continue to diversify, there will be a number of industries orienting principally to US markets, and others orienting principally to East Asian or other export markets, but most of them have some potential in both domestic and foreign markets. Alaska's seafood, wood products, oil and gas, coal, non-fuel minerals, and agricultural industries can each be expected to serve both domestic and foreign export markets to different degrees. The effect of the Jones Act will not be measurable with very much confidence in most of these industries, but in each of them, it can be expected to tilt the market balance in some degree away from Lower-48 markets and toward foreign export markets.

The same factors that bias the state's trade toward foreign exports will, moreover, have some tendency to tilt Alaska's resource-extraction and processing industries further in the direction of foreign ownership and management.

The most important Alaska industry that would be export-oriented, at least in part, is crude-oil production. If the Alaska North Slope (ANS) crude-oil producers faced no legal obstacles in selling their product where it obtained the highest netback price, they would ship a little less to the US West Coast than they do now, and the balance would be sold in the Far East, rather than in the Eastern part of the United States. The Jones Act, by reducing the netback prices from the West Coast relative to netback prices from Japan, would have some influence on this balance --- exports would be greater by some amount than they would have been in the absence of the Jones Act.

This inference is moot today, however, because the Trans-Alaska Pipeline Authorization Act severely restricts the exports of crude oil transported through pipelines crossing federal lands, and the Export Administration Act amendments of 1979 effectively prohibit exports of crude oil transported through the Trans Alaska Pipeline System (TAPS). The joint influence of these export restrictions and the Jones Act are sufficiently important that we have considered them separately in a section on "The Jones Act and the Alaska Crude-Oil Export Ban."

Finally, industrial facilities or processing operations can be located so as to minimize the impact of the Jones Act penalty, or to escape the export prohibition. American-owned refineries have located in the Caribbean, for example, partly because they could receive Middle Eastern or Venezuelan crude oil at those refineries via foreign-flag VLCCs, and then ship the refined products into US ports in smaller foreign-flag tankers. The reader can probably conceive of a number of possibilities of this sort, involving the processing or conversion of some Alaska resource product in Canada or some other foreign country, for reshipment in a new form back to the United States. Both legs of the journey might thereby escape the Jones Act limitations.

ALASKA CRUDE-OIL ECONOMICS: **THE JONES ACT AND THE EXPORT BAN**

The greatest Alaska impact of the Jones Act undoubtedly comes from its influence on the wellhead value of crude oil produced in the state. Alaska's state royalty and production-tax revenues are a direct function of the wellhead price; on some (still non-producing) leases in the Beaufort Sea, the state owns an additional net-profits interest that makes its revenues an increasing function of the wellhead price. The state's corporate income-tax collections on crude-oil production also depend on the wellhead price, and the expected wellhead price is a crucial variable in the oil companies' decision whether and how much to bid on a lease, explore a tract, develop a discovery, or invest in extended or enhanced recovery in a producing field.

The wellhead value of Alaska crude oil is a "netback" value, determined by subtracting transportation costs from the market value of the oil at the receiving refinery. This value at the refinery is, in turn, the price the refiner would have to pay to acquire a similar grade and quality of crude oil from another source. In the world at large, therefore, Alaska-produced crude oil is a price-taker, and higher transportation costs between the field and the refinery are deducted almost penny-for-penny from the wellhead price.

SH&E estimate the reduction in the value of Alaska crude resulting from the Jones Act at about \$225 million per year, based upon present levels of production in Alaska and the recent destinations of Prudhoe Bay crude oil. They obtained this figure by a straight comparison between required freight rates (RFRs) on US-flag and foreign-flag tankers on the Valdez-Los Angeles, Valdez-Panama, and Panama-Gulf Coast routes. While this calculation is a useful starting

point, readers should keep in mind several caveats about these assumptions.

Repeal of the Jones Act would not lead the Alaska crude-oil producers to replace their existing Jones Act tankers overnight with foreign-flag tankers. The companies have already incurred the acquisition costs for these tankers, either for their construction or for term charters, and their decision whether to retire them in favor of other vessels will not be based upon the difference between the RFR of the current fleet and that of the new vessels, but only on their relative running costs. Likewise, the companies have committed themselves to pay the new Panama pipeline's tariff for three years whether or not they actually use it. Thus, the trans-Panama cost is not one that shippers can instantly avoid by using foreign-flag VLCC's (supertankers) around the Horn. In valuing their oil at the wellhead for royalty and tax purposes, moreover, the companies can be expected to keep deducting the costs of the present tanker fleet from the refinery value of the oil until its costs have been amortized, even if some transportation alternative has a lower incremental cost.

It is also important to recognize that the companies' motivation to alter their transportation arrangements in order to increase the wellhead price is very weak. In other words, running-cost savings would have to be exceptionally large to justify any capital outlays for new transportation facilities. This circumstance stems from a combination of royalties and state and federal taxes that leaves the producers less than ten cents out of each dollar in added wellhead revenues at Prudhoe Bay or Cook Inlet. (Production from the Kuparuk field is, however, exempt from the federal windfall profits tax and is subject to a lower state severance tax than Prudhoe Bay production; as a result, the

companies retain about 40 percent of any increase in the Kuparuk wellhead price.)

For these reasons, SH&E's figure of \$225 million is valid only as an hypothesis about the past or the future. It is an estimate of how much higher Alaska wellhead revenues would now be if the Jones Act had not been in effect when the companies made their transportation investments or, alternatively, how much higher they would be after the end of the present Jones Act tanker fleet's economic life, if the Jones Act were repealed or waived today. For the latter purpose, however, SH&E's estimate of the Jones Act premium on the basis of comparing US-flag and foreign-flag RFR's is probably an understatement, for two reasons.

Firstly, the RFR is a valid basis for estimating the life-cycle cost of transportation for new Jones Act tankers that would be built to replace the present tanker fleet, because there is no surplus of unsubsidized, US-flag vessels such as those used on the Alaska run, and none is anticipated. Foreign-flag tankers of every kind, however, are available for purchase or long-term charter for considerably less than their original capital cost. About 40 percent of the world's VLCC's built since 1975 are idle because of the decline in world oil consumption. As this surplus capacity is not going disappear in the foreseeable future, it is more appropriate to compare the RFR on Jones Act tankers with the variable operating costs of foreign-flag tankers. If one makes this adjustment, using SH&E's cost data, the projected Jones Act premium corresponding to the current volume and destination of Alaska crude-oil production rises from SH&E's \$225 million to \$314 million.

Secondly, SH&E's calculations assume that two-thirds of Alaska production goes to the West Coast and one-third to the East Coast, and that the US West Coast and US Gulf Coast markets for Alaska crude oil

are economically separate, so that there are two sets of wellhead prices in Alaska. The higher price in this model is a netback from the West Coast, and the lower a netback from the Gulf Coast. On this basis, SH&E estimated the Jones Act cost premium separately for the two routes and then combined them to yield their total of \$225 million. These assumptions about the market for Alaska crude oil reasonably approximate the market's past operation, but they are unsuitable for projecting future prices. A worldwide buyers' market for crude oil, together with rising production in both Alaska and California, have intensified producer competition for the West Coast market, and are gradually breaking down the two price system. This market is moving in the direction of a system where the Valdez price will be the US Gulf Coast price less transportation charges from Valdez to the Gulf, while the California price will be the Valdez price plus transportation to the California refinery. (A technical appendix to this review, regarding "West Coast Oil Prices" explains how the two-price system operates and why it is breaking down.)

In the emerging one-price system, only the transportation cost between the Alaska and the US Gulf will affect the wellhead price of Alaska crude oil. Because the Jones Act penalty is greater on this longer route, therefore, its depressing effect on Alaska wellhead revenues will be considerably greater than estimated by SH&E. Using Jones Act and foreign-flag tanker RFRs on the Alaska-Panama and Panama-Gulf routes to determine the netback value of all Alaska crude oil would double the estimated Jones Act penalty, from \$225 million to \$450 million. If we also take the world tanker surplus into account, and compare Jones Act RFRs with foreign-flag running costs rather than foreign-flag RFRs, the estimated Jones Act penalty incurred by Alaska crude-oil rises from \$310 million per year to \$630 million.

The state's direct share of additions or reductions in wellhead prices is now about 28 percent, including royalties, production taxes, and state income taxes on profits from crude-oil production and TAPS operations. Thus, depending upon the additional assumptions adopted, the state's direct revenue loss from the Jones Act ranges from \$63 million to \$176 million annually.

Alaska crude-oil production would not have to bear this "Jones Act penalty" that amounts to some hundreds of millions of dollars annually if Congress had not prohibited the export of crude oil carried through TAPS. The Trans Alaska Pipeline Authorization Act of 1973 allows the export of crude oil carried by pipelines across federal lands (other than exchanges with Mexico or Canada) only under specified conditions, which must be certified by the President. In the 1979 "McKinney" amendment to the Export Administration Act, which was intensely lobbied for by the maritime interests, Congress took away the President's discretion on exports of North Slope oil, and effectively outlawed them. Even considered alone, this export restriction costs Alaska considerably more than does the Jones Act.

In the absence of the export ban, most of the Alaska crude oil now shipped to the US Gulf and East Coasts would be exported to Japan and other East Asian countries. The Jones Act would not, of course, apply to these shipments, and the netback value of Alaska crude oil would be its value in Japan (the price at which Japanese refiners could obtain a similar grade and quality of crude oil from another source) less foreign-flag tanker charges from Alaska to Japan.

There have been a number of studies of the cost of the export ban in lower wellhead revenues for Alaska crude oil. Their assumptions vary widely, but most of them conclude that the netback value of Alaska oil exported to the Far East in foreign-flag tankers would be

about the same as the netback value of Alaska oil sold on the US West Coast in competition with similar types of Middle Eastern oil. Japan is closer to the Persian Gulf than California, resulting in a somewhat lower "world-market" oil price there, but this differential just about offsets the greater penalty imposed in the US on North Slope oil because of its sulfur content and "high gravity". And the longer run from Alaska to Japan, compared with the run from Alaska to California just about offsets the Jones Act penalty on the domestic route.

In brief, if exports were permitted, all crude oil shipped from Alaska would have a netback value at least as high as the present West Coast netback price. The Jones Act would therefore no longer affect the third of Alaska's current production that moves beyond the West Coast; and the route to Japan is shorter and less complicated. Over time, an even more important effect of the export "window" would be to limit the competition between Alaska and California crude oils at California refineries, which otherwise threatens to depress all Alaska crude-oil prices to levels that reflect US Gulf Coast prices less Jones Act transportation costs.

Summary. If both the Jones Act and the ban on exporting Alaska oil remain in place, the wellhead value of all Alaska oil will ultimately be the world market price at the U.S. Gulf less pipeline and Jones Act shipping costs between Alaska and the Gulf. If both restrictions are waived, the wellhead value of all Alaska oil will ultimately be the world market price in Japan less pipeline and foreign-flag shipping costs between Alaska and Japan. If exports are permitted and the Jones Act remains unchanged, the wellhead value of Alaska oil will still rise to the world market price in Japan less pipeline and foreign-flag shipping costs between Alaska and Japan, because producers would not be willing to sell Alaska oil into US West

Coast markets unless they got at least as much for it there as they would get by exporting it.

Under the last set of circumstances, California consumers of Alaska oil, rather than Alaska producers, would pay the Jones Act penalty, while California producers would benefit from the resulting higher prices. Assuming that the market value of North Slope crude oil were about the same at both destinations, removing the export ban could ultimately raise Alaska wellhead prices by \$4-6 per barrel, or \$2-3 billion per year, on production at 1.6 million barrels per day --- regardless of whether anything was done about the Jones Act. We saw previously that repealing the Jones Act without allowing exports would ultimately increase wellhead prices for the same 1.6 million barrels per day by "only" \$450 to \$630 million.

The same cautions that we applied to the Alaska benefits of repealing the Jones Act apply here also. Firstly, the hypothetical benefits of oil exports would not appear overnight, as a large part of the transportation costs the shippers of Alaska oil now bear are fixed costs of existing transportation facilities, which have been or will be incurred whether or not the existing vessels, pipelines, and terminals continue to be used. Secondly, the combination of royalties and federal and state taxes has eliminated most, if not all, of the benefits the North Slope producing companies would get from exports. None of the big three (Sohio, Arco, and Exxon) is now advocating liberalization. Arco, which is able to use all of its Alaska crude oil in its own West Coast refineries, is expressly opposed to changing the law; the benefits of liberalization would go disproportionately to competing producers in Alaska (Sohio) or competing refiners on the West Coast (Chevron).

The federal share. An earlier page of this review pointed out that the crude-oil producing companies receive less than 10 cents out of

each additional dollar netted back to the wellhead at Prudhoe Bay or Cook Inlet; they also pay out less than 10 cents out of each additional dollar in transportation expense. We have seen that the government of Alaska captures about 28 cents of each additional dollar, and pays about 28 cents out of each added dollar charged for crude-oil transportation. Combining these numbers leads to a remarkable inference, which is one of Alaska's most promising political assets in any effort to amend the cabotage laws or prevent extension of the "McKinney" amendment to the Export Administration Act: The federal government will capture more than 60 percent of any incremental revenues from Alaska crude-oil production, by means of the "windfall profits tax" and the corporate income tax.

Long-term impacts: shifting the economic margin. The most far-reaching impact of the cabotage and export-licensing laws on Alaska's petroleum economy will be their influence on company decisions whether and where to explore new acreage; whether, when, and how to develop new discoveries; and whether, when, how to invest in enhancing or prolonging the output from producing fields. The minimum wellhead prices needed to justify exploring or developing different oil prospects and discoveries in Alaska are certain to cover a wide range of values; and minimum economic prices measured at an Alaska tanker terminal will reflect the minimum wellhead price plus transportation to the terminal, and will therefore vary even more widely. Five contrasting cases illustrate the significance of destination prices and transportation costs for these decisions.

(1) Established Production: Prudhoe Bay. With TAPS already in place and most of the investment in the Prudhoe Bay waterflood project already committed, variable costs for producing Prudhoe Bay crude oil and moving it through TAPS are very low. Likewise, the incremental

capital costs per barrel for contemplated investments in pressure maintenance are relatively modest. For this reason, it is hard to imagine any economic scenario in which the producers would shut in the field or abandon the already-programmed investments in enhanced recovery.

(2) Established Productions Kuparuk. In 1980, Arco began developing the Kuparuk field's first 20-square mile tract within an initial 210-square-mile development area (out of the field's total 557-square-mile extent). Although this field may be the second-largest oilfield ever to be developed in the United States, and although the incremental cost of transporting Kuparuk oil to tidewater through the nearby TAPS pipeline is minimal, the field's per barrel development and operating costs will be far higher than in the nearby Prudhoe Bay field. Primary recovery from the initial development area will produce only one-tenth of the volume of oil expected from Prudhoe Bay, but it will require almost twice the number of wells.

Drastic events would be needed to induce Arco to shut in the already-developed portion of the Kuparuk field or to cancel the additional drilling now programmed for the initial development sector. The company probably would not have decided to develop this field, however, if it had anticipated two years ago that world oil prices would begin to fall in 1981, or if Congress had failed to exempt Kuparuk from the windfall profits tax. The ongoing decline in world oil prices creates further uncertainty regarding the economics of developing the balance of the field or of undertaking secondary- and tertiary-recovery efforts. Given the present world-oil price outlook, there is a good chance that further development of the Kuparuk field hinges on the range of markets open to North Slope oil and the cost of shipping the oil beyond Valdez.

(3) A new field with low development costs and low intrastate transport costs. A giant oilfield located near an ice-free port, on Cook Inlet perhaps, might be economic to develop at a wellhead price as low as \$3 per barrel in 1982 dollars. Its product could conceivably be gathered, treated, loaded into a tanker and --- because it had not moved through TAPS --- exported to Japan in foreign-flag tankers at a additional cost of less than \$1 per barrel. This field would be a profitable investment, therefore, even if world crude-oil prices fell as low as \$5.00 per barrel, and neither the export ban nor the Jones Act would be an issue.

(4) A new field with low development costs and high intrastate transport costs. A geologically similar field located in a remote section of Northwest Alaska might be economically feasible to develop at a wellhead price as low as \$6 per barrel (reflecting the higher field-development and operating costs in the Arctic), yet remain unexploited even if world prices remained around \$30 or more, because the cost of of the necessary pipeline and tanker terminal, or of a pipeline connecting with TAPS plus the TAPS tariff, plus Jones Act tanker charges to a Louisiana port, were expected to exceed \$25 per barrel. Industry's decision whether on not to develop this prospect would, therefore, depend directly on the destinations to which they could legally ship the oil and the cost of tanker transportation to those destinations.

(5) A new field with high development costs and low intrastate transport costs: Ungu. If the Ungu heavy-oil deposit that overlies and extends beyond the boundaries of the Kuparuk unit proves to be commercial, it is likely to displace Prudhoe Bay as the largest oil field ever found in the United States or Canada. Industry geologists are confident that Ungu contains at least twice as much "oil-in-place" as Prudhoe Bay; some of them indeed suspect it to be several times larger.

The Ungu crude oil has an API "gravity" ranging from 11° to 22°, however, which means an "extremely heavy" to "heavy" oil that is comparatively troublesome and expensive to extract, comparatively troublesome and expensive to transport, and comparatively troublesome and expensive to refine. Each well may produce two orders of magnitude less oil per day than the average Prudhoe Bay well, and once the substance has been extracted and shipped out of Alaska, refiners will deem it an inferior product worth several dollars per barrel less than Prudhoe Bay oil.

Similar, smaller, heavy-oil deposits have been exploited for decades in California's San Joaquin Valley but, given the high cost of almost everything associated with petroleum development in Arctic Alaska, that fact does not establish a presumption that Ungu can be developed profitably. Even in California, heavy-oil fields requiring steam-or solvent-injection is needed to extract the oil have development and operating costs ranging from \$7 to \$20 per barrel. One indication how critical wellhead prices have been to the economics of this resource is the fact that nearly one-fourth of the proved reserves of heavy oil in California at the end of 1981, had been booked into the "proved" column only after the deregulation of heavy-oil prices in 1978 allowed their prices to rise into the \$19 to \$25 range.

The Ungu heavy-oil deposit has the advantage of proximity to TAPS, and it may in fact have two advantages over California heavy-oil fields. One is the huge size of the North Slope resource, which is likely to attract considerable scientific and engineering attention and considerable risk capital, if only for the purpose of investigating whether there is any economically feasible way to develop the field. The second is its likely access to very cheap energy for

steam-generation or down-hole combustion, in the form of otherwise unmarketable natural gas and/or natural-gas liquids.

At this pass, any judgment about the minimum wellhead price that justifies developing this potential "supergiant" would be little more than a hunch, and the world crude-oil price outlook is especially cloudy. Notwithstanding these uncertainties, it should not be a surprise to discover that the economic feasibility of producing oil from what may turn out to be the largest known field in North America depends upon the destinations to which it may be shipped and/or the nationality of the tankers that carry it.

Four generalizations stand out about this menu of prospects and discoveries:

- (1) Only the largest, most prolific, and/or most favorably located oil discoveries in Alaska will prove to be commercial.
- (2) The high cost of transportation within and from Alaska means that, in most places, a field must have a finding and development cost at the wellhead in the \$0 to \$20 range, even if constant-dollar world oil prices remain at their recent high levels.
- (3) Because the wellhead value of Alaska crude oil is determined by subtracting transportation costs from market prices elsewhere, a small percentage change in the world price, or a transportation-cost disadvantage that seems small relative to the refinery value of crude oil has a greatly magnified effect on wellhead values. If today's \$30 world price nets back to a seemingly adequate wellhead price of \$8 per barrel for some remote Arctic prospect, a 13-percent fall in the world price to \$26 would reduce the actual wellhead price by half.

Under the same conditions, a \$4 difference in the Alaska netback price of oil shipped to Japan in foreign-flag vessels, and

the Alaska netback price of oil shipped to Louisiana (or anywhere in the US, for that matter, because the West Coast price will probably be determined in Louisiana) would be 50 percent of the expected wellhead price. And the lower an oil prospect's minimum economic price at the wellhead, the more sensitive its development-feasibility will be to the crude-oil's destination prices and transportation costs.

- (4) The economic-feasibility thresholds for Alaska's crude-oil discoveries and prospects are certain to occupy a wide and nearly continuous spectrum of prices. Any event or institution that adversely affects netback values --- even by "only a dollar or so" per barrel --- carries the risk of bumping some Alaska oilfield out of the "commercial" into the "non-commercial" category. The depressing effect of the Jones Act and the export prohibition on wellhead prices is sure sooner or later, to prevent development of some major discovery in Alaska.

Granted, the course of world oil prices and industry's expectations regarding world oil prices are just as crucial as transport costs to the economics of petroleum development in Alaska. At any plausible world oil-price level, nevertheless, there is bound to be some oil in Alaska that is worth developing if it can be exported in foreign-flag tankers, but which will be uneconomic to develop for shipment to the US Gulf or East coasts in Jones Act Tankers. Different expectations about world oil prices will change the names of those borderline prospects, but some Alaska oil will always be on the economic margin.

HISTORICAL PERSPECTIVE ON THE JONES ACT: BOOM AND BUST IN THE US MERCHANT MARINE

The United States merchant fleet more than tripled in tonnage during World War I. Domestic shipyards had mass-produced literally thousands of new freighters and tankers: first to replace foreign vessels diverted to Europe from service between North American ports; then to provision the combatants and replace merchant vessels lost in the war; and finally to move and support American forces in Europe. (See Table 1.) Thus, the US-owned fleet grew from 5.8 million tons in 1915 to 16.0 million tons in 1920, and from 12 to 28 percent of the world's merchant shipping capacity. (See Table 2) Over the same years, the American fleet captured an even larger share of the traffic through domestic ports; US-flag vessels, which provided only 20 percent of the tonnage entering US seaports in 1915, accounted for more than half of it in 1920.

Such was the economic background to passage of the Jones Act. While the national-defense considerations described in the SH&E report (page 4) dominated Congressional debate, the concern that the US might once again be left in wartime without cargo ships could have been served just as effectively by measures that assured the existence of a US-controlled merchant fleet. This end could have been accomplished, for example, by allowing US-owned and manned, foreign-built vessels in the coastwise trade. It is reasonable to suspect that the reasons Congress reserved the coastwise trade to US vessels focused on finding a way to preserve some kind of market for a big domestic merchant fleet and a domestic shipbuilding industry, both of which had been created nearly overnight, and neither of which was really cost competitive in international trade.

Table 1: INDICATORS OF UNITED STATES SHIPBUILDING ACTIVITY

1914-1950						1951-1979					
Merchant Vessels Launched at US Shipyards			Production Workers, SIC 373 ^a			Merchant Vessels Launched at US Shipyards			Production Workers, SIC 373 ^a		
			Const. New US March.						Const. New US March.		
Cargo	Tankers	Total ^b	Total	Ves-		Cargo	Tankers	Total ^b	Total	Ves-	
(MDWT)	(MDWT)	(MDWT)	(000s)	sals ^c		(MDWT)	(MDWT)	(MDWT)	(000s)	sals ^c	
1914	130	67	198			1951	43	116	183	102	14
1915	131	30	174			1952	289	202	548	135	39
1916	300	247	554			1953	324	555	883	136	45
1917	627	314	951			1954	159	764	929	113	11
1918	2283	339	2646			1955	95	55	150	108	7
1919	4680	395	5086			1956	15	169	184	114	8
1920	2696	778	3585			1957	6	457	463	131	13
1921	485	1158	1886			1958	67	759	861	124	23
1922	156	71	261			1959	73	1095	1169	122	59
1923	110	23	159	63	21	1960	163	456	619	117	44
1924	48	11	79	51	16	1961	224	298	522	118	80
1925	92	0	103	51	15	1962	303	186	499	118	98
1926	26	15	57	53	21	1963	289	200	520	120	77
1927	104	50	181	55	22	1964	123	166	298	121	44
1928	0	44	81	43	10	1965	154	92	246	134	42
1929	49	15	84	55	18	1966	161	36	197	148	38
1930	24	161	224	59	23	1967	150	0	150	145	57
1931	0	70	155	45	16	1968	291	113	404	149	89
1932	22	0	105	37	9	1969	247	381	628	154	77
1933	0	0	32	31	5	1970	134	427	561	136	76
1934	15	0	15	41	2	1971	169	472	641	133	82
1935	0	30	30	45	6	1972	181	365	546	143	58
1936	0	105	105	58	15	1973	503	558	1061	148	74
1937	0	192	192	63	25	1974	377	679	1056	161	73
1938	56	228	284	56	34	1975	78	686	764	153	79
1939	128	193	341	70	30	1976	68	989	1058	170	86
1940	335	238	634	98	52	1977	30	1523	1553	179	110
1941	598	434	1089	225	168	1978	32	1569	1601	180	93
1942	6843	982	7906	742	668	1979	64	1943	2007	172	N/A
1943	14921	3420	18521	1230	1152						
1944	11858	3955	16143	1142	1010						
1945	7206	2787	10304	669	595						
1946	729	121	935	185	57						
1947	224	36	328	141	21						
1948	159	88	258	124	22						
1949	0	863	863	85	26						
1950	44	609	653	72	17						

Notes to Table 1

- a SIC 373: Employment in Ship and Boat Building and Repair. From US Department of Labor, Bureau of Labor Statistics, Employment and Earnings in the United States, 1909-1971, and 1975 and 1980 Statistical Abstract of the United States.
- b Total includes "passenger and combination" (not shown on this table), "cargo vessels", and "tankers". From US Department of Commerce, Bureau of the Census, Historical Statistics of the United States: Colonial Times to 1970, Series Q442-448; 1975 and 1980 Statistical Abstract of the United States.

Employment attributed to US merchant shipbuilding was estimated by ARTA using overlapping 15-year regression of total SIC 373 employment for year t against tonnage of ships launched in each of the three classes for year t and $t+1$.

**Table 2. THE US MERCHANT MARINE
BOOMS AND BUSTS --- TWICE**

	<u>Tonnage of Merchant Vessels</u>			<u>Vessels Entering US Seaports</u>			<u>Seamen Empl on US-Flag Merch't Vessels</u>
	<u>World Total</u>	<u>US- Owned</u>	<u>as % of Total</u>	<u>US</u>	<u>Foreign</u>	<u>% of Total</u>	
	(million tons)			(million tons)			('000s)
1915	49.2	5.8	11.9%	6.8	26.8	19.5%	n.a.
WW I	-	-	-	-	-	-	-
1920	57.3	16.0	27.9%	26.2	25.3	50.9%	n.a.
1930	69.6	15.9	22.9%	24.6	41.8	37.0%	64.2
1939	64.4	11.8	17.1%	14.5	43.4	25.1%	52.0
WW II	-	-	-	-	-	-	-
1948	69.4	29.1	36.4%	43.2	33.6	56.3%	82.1
1978	406.0	16.1	4.2%	34.0	389.8	8.0%	19.9

Sources:

US Department of Commerce, Bureau of the Census,
Historical Statistics of the United States, 1789-1970,
tables:

Q480 Q476 Q510 Q511 Q414

US Department of Commerce, Bureau of the Census,
1980 Statistical Abstract of the United States, tables:

1191 1179 1188

The Jones Act therefore reserved domestic waterborne carriage to vessels that were US-built, owned, registered, and manned, but the comparative economic disadvantage of the United States on a world scale nevertheless caused a steady attrition of US-owned and US-registered tonnage as existing vessels were scrapped, sold to foreign operators, or registered under flags of convenience. Between 1920 and 1939, the US-owned fleet contracted from 16.0 million to 11.8 million tons; and its share of the world total fell from 28 to 17 percent. The number of seamen employed on US merchant vessels fell 22 percent, from 63.8 thousand in 1929 (the first year for which comparable data are available) to 49.8 thousand in 1940.

The Second World War repeated the experience of the First on an even larger scale. Newly mobilized shipyards turned out thousands of "Liberty Ships" and tankers to replace US and foreign tonnage lost in the war, and to supply US forces and the Allies with military materiel and civilian supplies. By 1948, the tonnage of the United States fleet had nearly tripled its prewar level, and its share of world cargo tonnage had more than doubled, to 36 percent from the 17 percent it occupied in 1939. US-flag carriers accounted for more than 56 percent of the cargo-vessel tonnage entering US seaports in 1948, up from 25 percent in 1939.

Once again, however, the high comparative costs of building and manning ships in the United States took their toll. US merchant-ship tonnage fell steadily from 29 million in 1948 to 16 million in 1978, the same level as in 1920, while the world's total tonnage multiplied almost sixfold, from 69 to 406 million tons. The US share of the world market shrank from 36.4 to 4.2 percent, and the nation's share of merchant tonnage entering its own seaports fell from 56.3 to 8.0 percent. The contraction of the merchant-marine workforce was even more drama-

tic, as high labor costs impelled operators to automate shipboard operations. From a 1945 high of 160 thousand, the number of persons employed on US-flag merchant vessels was about halved to 82 thousand by 1948; halved again to 39 thousand in 1965; and halved once more to less than 20 thousand in 1979.

Thus, the determination of US shipping interests (and particularly the maritime unions) to preserve their Jones Act monopoly in the one piece of the world market where their presence still counted sprang from the economic decline of the American shipping industry and from the fact that, in every year since 1948, there have been more unemployed and former merchant seamen and officers than currently employed seamen and officers. The figures we have cited here actually understate the potential surplus of maritime workers in the United States, because they exclude the tens of thousands of former Navy personnel who have had the necessary skills and the desire --- if jobs had been available --- to remain on the sea.

Thus, the campaign of American shipowners and maritime unions to preserve the cabotage laws, and to obtain construction loan guarantees and construction and operating subsidies, has been more than a struggle for markets, jurisdiction, or dues-payers, but a battle for industry and union survival. The dedication and financial resources that America's merchant seamen and officers have put at the disposal of their lobbyists have reflected the fact that, on the whole, this battle has been a losing one.

The combination of cabotage laws, construction-cost, and operating-cost subsidies has been somewhat more successful in maintaining shipyard employment than shipboard employment. While the actual tonnage of ships launched has tended to fluctuate violently from year to year, Table 1 shows shipyard employment in the mid-1970s relatively

stable at 170-180 thousand workers. About half of these jobs can be attributed to construction of US-flag merchant ships. The bulk of that work was, indeed, tanker construction --- mainly for the Alaska trade.

Since World War II, the legislative efforts of domestic maritime interests have not only been exceptionally dedicated but, considering the small economic interest they represent, they have also been exceptionally effective. Although the shipbuilding labor force has tended to outnumber shipboard personnel several-fold, it is the maritime unions who have been the heart and backbone of the effort to preserve and extend the cabotage laws. The success of the US shipping lobby has been possible, in large part, because of the distinctive sociology of maritime labor and the distinctive political history of the maritime unions --- fascinating issues that do not concern us here.

An important heritage of this history, however, is the highly political orientation of the union leadership; their ability to use its apparatus as an "organizational weapon"; and the members' willingness to contribute heavily in time and money to the cause. The maritime unions have shown persistence, cohesiveness, and political sophistication that outshines the shipowners and both management and unions in the shipbuilding industry, not to mention shipper, consumer, or taxpayer interests.

The power of the industry, and especially the unions, is now probably at the lowest point since World War II. Most of the old union leaders are gone; their most reliable political servants (e.g., Garmatz and Murphy) have succumbed to age or Abscam. By and large, the American seaman and the American merchant marine have both disappeared from the stage. The only important domain left to them is the coastwise tanker trade. Only the shadow of their former political sophistication and power survive.

There is irony in this history of the American merchant marine under the Jones Act. The United States coastwise trade and the number of American nationals engaged in that trade is probably smaller than it would have been if the Jones Act requirement of US-built carriers had not been in effect. For it tends to be construction cost for American vessels, more than domestic labor costs or safety and environmental standards, which have made the US fleet non-competitive. In the coastwise trade, the Jones Act has indeed prevented competition from diverting business to foreign vessels. High costs have, instead, diverted traffic to the rails, to the highways, and to pipelines. They have led investors to locate industrial facilities (e.g., Caribbean oil refineries) expressly to avoid the need to use Jones Act shipping.

The Jones Act may thus have made a major contribution to the near disappearance of the US coastwise trade, except for petroleum; even for petroleum, domestic waterborne cargoes are probably considerably smaller than they would otherwise be. If foreign-built ships, registered in the United States, subject to US labor and environmental laws, and manned by US nationals, were permitted in the coastwise trade, more domestic cargoes would certainly move by water than they now do. We can not say what kinds and volumes of cargo would be made sufficiently cheaper to shift from land to waterborne transport if foreign-built vessels could be used between United States ports. It is conceivable, however that US-owned, licensed, and manned, foreign-built container ships could command a substantial portion of the container and piggyback loads now on the highways and on the rails. A strategy emphasizing this possibility might split the maritime unions, who have been the most effective part of the Jones Act coalition, away from the shipbuilders.

APPENDIX

The following material on West Coast oil prices is extracted from the technical appendix to a report ARTA prepared in 1981 for West-coast Transmission Company and Petrocanada in connection with their application to the British Columbia Utilities Commission for a license to build and operate the "Rimgas" LNG-export facility.

1. WEST COAST OIL PRICES

World oil-price levels. World crude-oil markets are now [June 1981] in the process of rationalizing themselves around the \$32.00 (U.S.) official price of Saudi Arabian "marker" crude. The Saudi government's current strategy is to maintain a global crude-oil surplus until competitive forces have squeezed out all price premiums and disparities that do not reflect quality or transportation-cost differentials, and thereafter to use Saudi Arabia's market power to decide whether, when, and in what direction the whole complex of world oil prices will move.

No one can forecast the actual direction of world oil prices over the next decade with any confidence, however. On the one hand, a new Middle Eastern political or military upheaval might be followed by a third great surge in world oil prices that would leave the Saudi government's current wishes and plans almost irrelevant. On the other, it is not clear that even large cutbacks in Saudi production could prevent the global price structure from sinking to a floor substantially below \$32, if oil companies and traders started desperately unloading their existing crude-oil inventories in the belief that a price collapse was imminent. Finally, there is no consensus among the experts (and most likely none in the Saudi government itself) about the long-term policy which that government would or should pursue if it did gain undisputed control over world oil prices.

Regardless whether oil prices are stabilized in nominal dollars or in real dollars, surge upward once more, or collapse to, say, 1970 levels, it is almost certain that Persian Gulf crude oil will be the world's marginal supply, and that petroleum prices worldwide will therefore reflect

page two

export prices at the Persian Gulf (most likely for Arabian Light crude oil), plus transportation costs from the Persian Gulf "basing point", and an adjustment (plus or minus) for the grade and quality of the crude oil.

U.S. and West Coast crude-oil prices. A similar process of rationalization is under way in the United States as the February 1981 ending of oil-price controls and the entitlements system permits market forces to realign domestic crude-oil prices on the basis of quality and location. In a fully rationalized market, crude-oil prices on the West Coast of the United States would be significantly lower than those for comparable grades of oil East of the Rockies, despite slightly higher tanker charges from the primary basing point in the Persian Gulf.

The reason for lower prices in PAD District V (Alaska, Washington, Oregon, California, Arizona, and Hawaii) is that the District's refinery demand for crude oil is less than its crude-oil production (which is almost entirely from Alaska and California). District V's net exports of crude oil in 1980 were about 45 million barrels or 123 thousand barrels per day (mb/d); because of increased production and reduced demand, net exports have now [June 1981] risen to about 400 mb/d and can be expected to continue growing until at least 1986-87, when output from Prudhoe Bay will begin to decline. [See Table 1.]

The crude oil exported from the West Coast states is mostly Alaska North Slope (ANS) oil, carried in large tankers (VLCCs) from Valdez, Alaska to Panama, where it is transferred to smaller tankers that transit the Canal to Gulf Coast, Atlantic, and Caribbean refineries. After oil markets have had an opportunity to adjust to decontrol

**Table 1. U.S. West Coast Crude-Oil Exports and Imports
(PAD District V, 1979-80, thousand barrels per day)**

	1979	1980	
	Jan-Dec	Jan-Nov	Dec
Exports (mainly ANS crude) to:			
U.S. Gulf	131.4	274.8	252.8
U.S. Atlantic Coast	47.8	83.2	113.9
Other (mainly U.S. possessions)	159.4	192.2	234.5
<u>Total Exports</u>	<u>338.6</u>	<u>539.0</u>	<u>601.2</u>
Imports from:			
Indonesia	324.7	282.4	159.3
Malaysia	51.9	61.6	44.8
Persian Gulf	107.6	45.2	26.1
Others	43.7	44.1	6.9
<u>Total Imports</u>	<u>527.9</u>	<u>437.5</u>	<u>244.9</u>
<u>NET EXPORTS (IMPORTS)</u>	<u>(189.3)</u>	<u>101.5</u>	<u>356.3</u>

Source: U.S. Department of Energy, Energy Data Reports:
Crude Petroleum, Petroleum Products, and Natural Gas
Liquids (December, 1980).

and the growing West Coast surplus, ANS crude oil will become the "marker" crude and Valdez will become the basing-point for all West Coast oil prices. Table 2 shows the way in which the "netback" value of ANS crude oil at Valdez would determine the wellhead price of a hypothetical California heavy crude oil (CHCO) might be determined, on the basis of approximate current values.

The two-price system for ANS crude oil. Thus far, however, the ANS producers have been able to maintain two prices at Valdez --- a netback price from the U.S. Gulf determined essentially as described in Table 2, and a higher netback price for shipments to West Coast refineries that is established by reference to the price of Indonesian imports in California, with adjustments for quality and transportation-cost differentials.

Table 2: Determination of California Heavy Oil Price

Arabian Light (AL) price FOB Ras Tanura	\$32.00
+ Tanker charge, Ras Tanura to LOOP	1.25
= AL price CIF LOOP	33.25
- Quality penalty ANS vs. AL	(.35)
= ANS value CIF LOOP	32.85
- Tanker charges, Valdez to LOOP	(5.85)
= <u>ANS price FOB Valdez</u>	<u>\$27.00</u>
ANS price FOB Valdez	\$27.00
+ Tanker charge, Valdez to Long Beach	1.75
= ANS price CIF Long Beach	28.75
- Quality penalty CHCO vs. ANS	(2.80)
= CHCO value CIF Long Beach	25.95
- Pipeline charge Kern Co. - Long Beach	(.55)
= <u>CHCO wellhead value @ Kern Co.</u>	<u>\$25.40</u>

Explanation: all parties in the table, except Petromin (the Saudi government oil company) are price-takers; they can sell all the oil they wish at the given price. Saudi Arabia may set the price because it is the marginal producer, but only if it delivers whatever the market demands at that price, no more and no less. Sohio is a price-taker at the U.S. Gulf, but until recently at least, it has been the marginal producer and therefore the price-maker on the U.S. West Coast in the same sense that Saudi Arabia is the global price-maker. In the near future, however, Sohio will share this role with other companies, and competition will align West Coast crude-oil prices in the manner shown here.

Moving up the table, Kern County is a net exporter of heavy oil; producers there can sell as much as they wish by "backing out" ANS crude from Los Angeles basin refineries; to do so, they must pay (55 cents per barrel) for pipeline transportation, and accept a price discount (\$2.80) relative to the CIF price of ANS crude (\$26.75) that corresponds to the higher cost of refining the heavy crude, and the lower value of the products produced from it. Los Angeles basin refiners, in turn, can obtain as much ANS crude oil as they want, by paying tanker charges from Valdez (\$1.75) plus an FOB price (\$27.00) equal to what the producer would get for it CIF at the U.S. Gulf (\$32.85) less the cost of shipping it there (\$5.85). The FOB value of ANS crude oil at the U.S. Gulf is the CIF price at which refiners can get Arabian Light (33.25), less a penalty for the lower quality of ANS crude (35 cents); and the CIF price of Arabian Light is the FOB Persian Gulf price (\$32.00) plus tanker-transport costs (\$1.25).

page five

Lower prices for ANS crude would have allowed the ANS producers to sell more oil in District V by accelerating the substitution of ANS oil for imports and by retarding the development of high-cost heavy-oil production in California. But such price reductions by one ANS producer would have met with comparable reductions by other ANS and California oil producers. The increase in the number of barrels of District V crude oil refined on the West Coast would have been relatively small, so that the total revenues of all West Coast producers would have declined. It has been in the interest of the ANS and California producers, therefore, that West Coast crude-oil prices remain above the levels that would prevail in a competitive, rationalized market.

A special factor that dampened producer competition for West Coast petroleum markets was the price control system which, from about July 1979 until February 1981, made producers of price-controlled ANS oil indifferent to its transportation cost and, beginning in 1974, had made a large proportion of California's heavy oil uneconomic to produce.

Finally, the Windfall Profits Tax (WPT), which was imposed on decontrolled crude oil in January 1980, drastically reduces the incentive of individual ANS producers to optimize their transportation and marketing arrangements in order to maximize wellhead revenues. The WPT leaves the ANS producers only 8 cents out of each dollar's increase in the wellhead price after payment of royalties, State severance taxes, and State and Federal income taxes. An effective marginal tax rate of 92 percent on oil-production revenues clear / invites integrated oil companies to find means of shifting some of their profits from crude-oil production to their refining or transportation operations, which are taxed at much lower rates.

page six

Where a producer's marginal tax rate is 92 percent, the WPT creates an incentive, for example, for the producers to ship their crude oil to affiliated refineries at an artificially low "transfer" price, or to arrange exchanges with other integrated companies that have a similar incentive to understate the value of their crude oil, even when doing so requires otherwise unnecessary transportation expense that reduce netback prices at the wellhead.

Despite the interest of all West Coast producers in preserving the two-price system for ANS crude oil, it has been able to survive until now only because one company, Sohio, was the marginal supplier of domestic oil to West Coast refineries, and the main exporter of West Coast oil to the Gulf and Atlantic coasts. Since 1977, that position has given Sohio the power to determine District V oil prices within a wide range, by deciding how it will allocate its ANS crude oil between West Coast refineries and refineries East of the Rockies. Understandably, the company has not chosen to "spoil" its own District V market (and everyone else's) by competing vigorously for a slightly larger share of that market.

End of the two-price system. Price controls and the entitlements system are gone, and Sohio is losing (if it has not already lost) its special ability to support West Coast oil prices; thus, the two-price arrangement for ANS crude oil at Valdez is unlikely to survive the intensified competition for market shares that will occur in the 1980's.

Because of the general decline in petroleum-products consumption and the growth of ANS and California heavy-oil production, ARCO and Exxon (as well as Sohio) are already having to ship substantial amounts of ANS crude oil East of the Rockies. ARCO will begin producing from the Kuparuk

page seven

River formation at Prudhoe Bay in 1982; year-end production will be about 80 mb/d, and may rise to as much as 200 mb/d by 1985. The anti-trust laws forbid the producers from coordinating their decisions on allocation of ANS crude oil between District V and other markets, but without such coordination, Sohio, Exxon, and Arco are doomed to compete with one another trying to sell crude oil to Chevron, Union, and other West Coast refiners.

The State of Alaska may also aggravate the downward pressure on District V prices by its policy of selling royalty oil independently of the ANS producers, at a price that it sets (perhaps unwittingly) below the market value of the crude oil. In April 1981, for example, a Charter Oil subsidiary withdrew from a contract with Alaska in which it was lifting 75 mb/d of ANS royalty oil at the "in-value price" --- a price equal to the royalty the State could have received in cash from the producers for the same oil. Unlike the producers' own crude-oil, however, State royalty oil is not subject to severance tax; thus, Charter received crude oil for more than two dollars per barrel less than it would have had to pay one of the producers for identical oil. (Ironically, Charter withdrew from the purchase contract mainly because it was losing money on the transaction despite this discount).

Finally, California heavy-oil production continues to grow. The biggest producers are Getty and Shell. Getty has only about 5 mb/d of ANS production and Shell has none; thus they will have no reason not to price their California product at whatever levels clear the market --- at the expense of ANS sales to California refiners. All in all, the outlook is for vigorous price competition throughout District V in the 1980's, and a rapid rationalization of prices in the District around the price of ANS crude oil at Valdez.

page eight

The ANS producers could still forestall the erosion of West Coast oil prices relative to the price of Middle Eastern imports, if they were permitted to ship ANS crude oil to the Far East: the highest attainable netback value at Valdez, would probably result from foreign-tanker shipments to Japan, where its value is equal to or higher than that of Arabian Light. The relative value of West Coast petroleum would also increase if a large-volume crude-oil pipeline system connected District V with the Midwestern States (but only if that pipeline were utilized at or near its design capacity). However, the Export Administration Act forbids overseas exports of ANS crude oil, and the near-term outlook is not favorable either for liberalization of exports or for construction of a new transcontinental pipeline system along the lines of those proposed by Trans-Mountain, Northern Tier, or Foothills.

These conditions mean that competition will press the entire structure of PAD District V crude-oil prices toward a level three to four dollars below those of the Gulf and Atlantic coasts. The April 1981 appearance of a West Coast spot price for ANS crude oil (\$31.00) three dollars below the average Gulf Coast contract price (\$33.97) and more than two dollars below the Gulf Coast spot market price (\$33.30) may be evidence that sufficient price competition already exists to bring about this result.

West Coast crude-oil grade and quality vs. product-slate trends. The effect of the West Coast oil surplus on the crude-oil price structure is complicated by a mismatch between the mix of crude oil that District V produces and the slate of petroleum products it consumes. Relative to other parts of the United States, the West Coast's petroleum-product demand is concentrated in lighter products --- gasoline, jet fuel, and middle distillates (diesel and

page nine

heating oil)), as opposed to heavy fuel oils. Also, air-quality considerations demand a lower average sulfur content in fuel oil than in other regions, but the producing fields in Alaska and California are, unfortunately, comparatively rich in both the heavier crude-oil fractions and sulfur.

The average District V refinery feedstock is, therefore, relatively costly to process into the product slates demanded by West Coast consumers. In addition, the value of different West Coast crude oils in, say, the Los Angeles area, varies over a range of more than six dollars per barrel, depending largely upon the proportion of low-valued residual oil in each of them or (what is essentially the same thing) the relative cost of processing them into higher-valued refined products.

Because of a progressive shift of District V production toward "lower-gravity" (higher-residue) and higher-sulfur crude oils, and a simultaneous decline in the demand for residual oil (particularly high-sulfur residual oil), disposal of residual oil is a chronic problem for West Coast refineries. A refiner has five fundamental options for coping with this problem:

- 1) To change the crude-oil feedstock mix in the direction of crudes that produce less residual oil, and/or contain less sulfur, but at a higher raw-materials price per barrel.
- 2) To ship the surplus residual oil into another market where it is worth more.
- 3) To adjust the refinery's operations to produce less residual oil, but at a higher operating cost per barrel, and with a reduction in the refinery's effective capacity;

- 4) To invest in additional cokers, hydrocrackers, vis-breakers, and/or hydrotreaters, in order to upgrade residual oil into higher-value products; and
- 5) To sell the residual oil in existing local markets (including the market for ship's bunkers), at whatever price it will command.

The tradeoffs among these options are crucial to any projection of short- and long-term price differentials between residual oil and distillate fuel oil; high-sulfur and low-sulfur residual oil; and petroleum products and crude-oil. These price differentials also depend on the array of crude-oil grade and quality differentials, while the crude-oil price structure reflects, in turn, the structure of petroleum-product prices. All of these price relationships are also functions of demand conditions for various petroleum products, the relative abundance of different types of crude oil, and the technical characteristics of the existing District V refinery stock.

A rigorous analysis of all these factors would require a sophisticated model that, as far as we know, does not exist today and whose precision, moreover, would be swamped by uncertainty about several important input variables. For the purposes of this report, a few basic principles may be adequate to forecast some important limits to the range of West Coast fuel-oil prices.

Bracketing the industrial fuel-oil price: (1) Maximum prices. Industrial fuel-oil prices can not long exceed the prices of their caloric equivalents in crude oil of comparable sulfur content. If the price of high-sulfur residual oil were higher than the price at which the cheapest high-sulfur California heavy crude oil could be brought to tidewater, ship operators would buy the heavy crude oil in place of residual oil for their bunkers.

For example, if a 14° API, 2.5-percent sulfur crude oil sold at tidewater in the Los Angeles basin for \$5.79 per barrel less than the CIF price of ANS crude (as suggested by the price coefficients on page 16), it is unlikely that the price of 3-percent residual oil at Seattle would persistently exceed the ANS price in Los Angeles, less \$5.79, plus tanker charges from Southern California to Puget Sound. Likewise, if the price of 1-percent-sulfur residual oil in the San Francisco Bay area exceeded the price of ANS crude oil, industrial consumers who were allowed to use 1-percent fuel oil would burn ANS crude instead.

Any desired proportion of residual oil in a crude-oil feedstock can be obtained by blending, so the relation between the percentage of residue in crude oils and their prices will be almost linear. Likewise, because any desired sulfur content in heavy fuel oil can be obtained by blending, the relationship between the sulfur content of residual oils or heavy gas oils and their market value also tends to be linear. Thus, the price of low-sulfur (maximum 0.3 percent S) fuel oil is not likely to rise above either the cost of a mixture containing 77 percent Indonesian Minas crude oil (0.08 percent S) and 23 percent ANS crude (1.05 percent S), or a that of a mixture containing 70 percent sulfur-free gas oil or distillate oil and 30 percent ANS crude or 1-percent-sulfur residual oil.

(2) Minimum prices in the short-term. The lowest price that can be sustained for an industrial fuel oil of a given sulfur content is the price that clears the market, because it is low enough (1) to offset the added cost of adjusting the operations of existing refinery equipment to produce a smaller volume of residual oil and/or high-sulfur oils, and a larger volume of higher-valued products; (2) to overcome transport costs to other markets that have a less acute

page twelve [7/7]

surplus of residual oil (e.g., the Atlantic Coast or the Far East); (3) to persuade industrial consumers that have dual or multi-fuel capabilities to use oil instead of natural gas or coal; and/or (4) to attract ships from their usual routes in order to save money on bunker oil.

Refinery operations. Authoritative studies published in 1979 and 1980 (e.g., Bonner & Moore's, 1985 California Oil Senario Study [1979], Purvin & Gertz's Analysis of the Potential for Upgrading Domestic Refining Capacity [March 1980], and the National Petroleum Council's Refinery Flexibility Study [December 1980]) pointed to the need for great investments in refinery modification during the 1980's to deal with the worsening mismatch between the mix of refinery feedstocks and the mix of product demand.

Overall petroleum-product consumption in the United States has declined more than 24 percent (on a comparable-month basis) since 1978, when most of the work was done on these studies; subsequent forecasts of West Coast, U.S., and world petroleum demand in 1985, 1990, and 2000 have fallen correspondingly, and made much of the analysis obsolete. The present excess of refinery capacity has enhanced the ability of refiners to modify their operations to produce less residual oil and lower-sulfur products from a given feedstock without major capital expenditures. Thus, Booz-Allen, in a draft update of the 1979 Bonner & Moore study [Residual Oil Marketing and Heavy Crude Refining Operations, February 1981], concludes that the existing California refinery stock and the modifications now under way will be sufficient until at least 1992, to accomodate both the shift in product slates and an acceleration of California heavy-oil production.

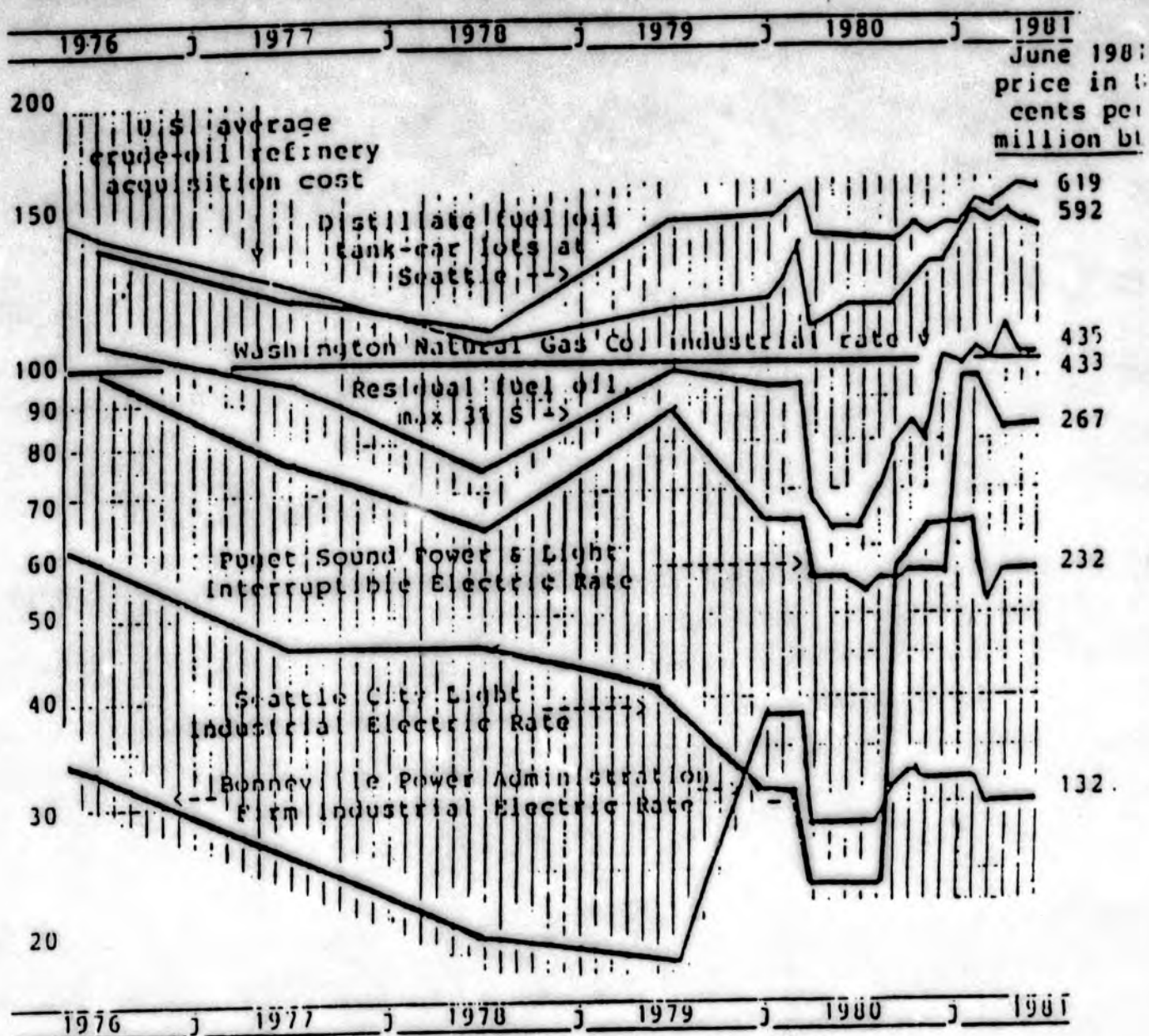
Lower consumption both takes some of the anticipated pressure off remaining reserves of high-gravity and low-

sulfur feedstocks, and increases the flexibility of existing refineries to shift feedstocks and product mix. For example, the heavy gas oil or residual oil produced by an existing cracker or coker can be "cycled to extinction" by running it back through the same unit again and again, rather than putting them on the market directly as industrial or bunker fuels.

Because this recycled heavy oil displaces an equal volume of feedstock that would otherwise be coming to the coker or cracker from the fractionating tower or vacuum-distillation set, the effective capacity of the cracker or coker will be reduced proportionally, and its fuel-consumption per unit of production similarly increased. The additional flexibility created by excess capacity is thus available only at an added cost which, as crucial elements of the refinery are used more intensively, at some point exceeds the unit cost of either (1) replacing some domestic high-sulfur, heavy oil with higher-quality (and more expensive) imported crude, (2) dumping the excess residual oil into the market for whatever it will get, or (3) investing in new residual-oil upgrading capacity.

Local and distant markets. One option for disposing of excess high-sulfur residual oil is to ship it to another market where it is allowed to be burned, and where relative prices are more favorable to residual oil generally or to high-sulfur fuels. For example, the Pacific Northwest is an important "dump" for high-sulfur residual oil that air-quality regulations make unusable in Southern California. In the winter, high-sulfur residual-oil prices in the Northwest states appear to settle at a price just low enough to persuade owners who can use either fuel to burn oil instead of gas. In the last three summers, however, when electric-utility and heating-fuel demand were seasonally

Figure 1 COMPARISON OF NORTHWEST INDUSTRIAL ENERGY RATES:
Ratio of price per btu to industrial gas price, Washington Natural
Gas Company, Seattle (Natural-gas price = 100)



Notes: 1976-1979 data are annual averages. Gas price is average interruptible charge from Washington Natural Gas Company Tariff Book Information Bulletin: Chronology of Rate Changes [10-1-1980]. Crude oil acquisition costs are from Monthly Energy Review and telephone inquiry to Energy Information Administration. Distillate fuel oil and residual fuel oil prices are median annual or monthly low quotations from Platt's Oilgram Price Report and Oilmanac; distillate oil was converted at 138 mbtu per gallon, and high-sulfur residual oil at 6,325 mbtu per barrel. Electric rates are lowest energy charge, converted at 3,124 btu per kwh, from current utility rate sheets; 1976-79 rates calculated at midpoint of summer and winter rates.

depressed, residual-oil prices fell low enough in California to attract ships from as far away as Panama, and low enough in the Pacific Northwest to displace some electricity from the region's industrial markets. [See Figure 1.]

The large excess of crude-oil processing capacity that exists in District V and nationally means that the least economic refinery unit still in operation (or the next one to be shut down) is barely breaking even on its feedstock costs. In other words, the composite barrel of petroleum products which that refinery produces will have a value about equal to the average cost of the crude oil processed. If residual-oil prices are low relative to crude-oil prices, because of weak demand and an inflexible refinery stock, distillate fuel-oil and gasoline prices will have to be comparatively higher, if the marginal refiner is to avoid an operating loss and a decision to shut down. This relationship is part of the reason prices of refined petroleum products in District V remained stable or continued to rise during the second quarter of 1981, despite falling crude-oil prices everywhere, and falling petroleum-product prices everywhere but the West Coast.

(3) Minimum prices in the long run: Refinery modifications. While the refinery studies cited above may be largely obsolete with respect to forecasting the absolute amount of investment in refinery modifications that will be necessary or economic, the Bonner & Moore report is especially valuable as a framework for calculating the cost of adding capacity to produce an additional barrel per day of sulfur-free industrial fuel oil or additional barrel of distillate fuel oil in place of a corresponding (but not exactly equal) amount of high-sulfur residual oil); or to substitute a barrel per day of ANS crude oil for Indonesian

imports, or a barrel per day of California heavy crude for ANS crude, while maintaining the same product slate.

Desulfurization. The differences between Bonner & Moore scenarios 7 and 8 (for complex refineries and the "expected-gas" case) show that 303 mb/d of residual oil can be reduced in average sulfur content from .78 to .48 percent at a capital cost of \$1,014 per daily barrel.

This figure implies a cost of \$10,277 in 1981 U.S. dollars (as inflated by the Nelson Refinery Cost Index) to add the capacity to produce one barrel per day of zero-sulfur heavy fuel oil in place of 3-percent residual oil. A levelized fixed charge of \$5.78 per barrel is, therefore, needed to generate a 20-percent rate of return on this investment over a 20-year plant life; additional operating costs come to \$3.33 per barrel. If the ability to blend fuels makes the cost of desulfurization proportional to the amount of sulfur removed, we can use the resulting total of \$9.11 per barrel either as the cost of totally desulfurizing one barrel of residual oil or as the cost of, say, producing six barrels of 0.5-percent in place of a similar amount of 1.0-percent residual oil.

Similarly, a comparison of Bonner & Moore's scenarios 8 and 12 shows an incremental capital cost of \$2,397 per barrel per day in 1978 dollars to replace 413 mb/d of imported crude oil with ANS and California heavy crude. This substitution would reduce the average gravity of California refinery feedstocks from API 27.0° to 23.9°, and increase their average sulfur content from 0.95 percent to 1.21 percent. These scenarios, together with scenario 10, which replaces a specified volume of ANS crude oil with California oil, produce a "shadow" price-penalty of \$3.03 per barrel for each percentage-point of sulfur content.

The same coefficient of \$3.03 per percentage-point of sulfur-content per barrel applies (within a few pennies) to sulfur in both crude oil and industrial fuel oils. Comparisons among the various scenarios also produce a shadow price-premium of 10.6 cents per degree of API gravity per barrel, and imply that the fixed and operating costs of producing an additional barrel of No. 2 distillate oil in place of high-sulfur residual oil are \$9.50 per barrel, composed of \$7.14 for residual-oil destruction plus \$2.36 for desulfurization.

If these numbers are reasonably valid, they mean that refiners will invest in desulfurization facilities if and only if they expect the price penalty for both high-sulfur fuel oil and high-sulfur crude oil to remain at least \$3.00 per percentage-point of sulfur content. (Both differentials are necessary: if the difference in price between 0.5-percent sulfur residual oil and 3-percent residual oil is greater than \$7.50 (\$3.00 per barrel-percent), but the sulfur penalty in the crude-oil market is, say, only \$2.00 per percentage-point per barrel, it is cheaper for the refiner to buy a lower-sulfur feedstock than to invest in refinery modifications.)

Conclusion: Price differentials between high-sulfur residual oil, distillate fuel oil, ANS crude oil, and crude-oil import prices. The preceeding analysis leads us to believe that the long-term floor price (and the most-likely long-term average price) for high-sulfur residual oil (3.0 percent and Bunker C) on the West Coast will be about \$9.00 to \$10.00 per barrel less than the price of zero-sulfur fuel oil, either distillate or heavy gas oil. Average prices of other industrial fuel oil grades will be arrayed between these extremes in inverse proportion to their sulfur content. Prices will swing seasonally, and ~~James~~ no reason to expect much change from the current

09/20/82

Page 57

page eighteen [7/7]

pattern in the Pacific Northwest, where high-sulfur residual-oil prices are just low enough in winter to capture the swing industrial market from natural gas, but where summer prices are even lower, competing with "hog-fuel" (sawdust and chips) in the wood products industries, and with the energy charges in industrial electric rates.

The marginal District V refinery will be a refinery that processes the marginal West Coast crude oil (ANS crude) to produce a product slate that is 25 to 30 percent high-sulfur residual oil. Such a refinery will just break even on its crude-oil costs with this product mix. With a price differential between distillate fuel oil and high-sulfur residual oil that must be \$9 to \$10 per barrel in order to justify any refiner's investing in new facilities to process residual oil into higher-value products, the expected price differential between residual oil and ANS crude oil will be between \$6.30 per barrel (if the output of the marginal refinery is 30 percent residual oil, and the expected price differential between distillate and residual fuel oil prices is \$9.00 per barrel) and \$7.50 per barrel if the residual-distillate price differential is \$10.00 and residual oil 25 percent of output).

Given the present export restrictions and the absence of a transcontinental crude-oil pipeline, ANS crude oil will in turn be three or four dollars per barrel below the landed price of Arabian Light in North America. These considerations imply that average residual-oil prices in Puget Sound will remain very low relative to the cost of imported crude oil --- moving toward a difference of perhaps \$9 to \$11 per barrel or more in 1981 U.S. dollars.

The same calculations suggest that the long-term prices of distillate fuel oil and zero-sulfur gas oil on the U.S.

West Coast will tend to be on the order of \$2.50 per barrel higher than the price of ANS crude oil, making its price a bit less than the landed price of Arabian Light in North America. Table 2 shows the price-spread for industrial fuel oils on the Pacific Coast implied by this analysis and by the crude-oil pricing scheme illustrated in Table 2.

Table 3. West Coast Industrial-Fuel Price Scenarios

	\$/bbl	\$/mmbtu	percent of CIF price, Arab Light
ARABIAN LIGHT (AL) FOB Ras Tanura	\$32.00		
+ Tanker charge, Ras Tanura to LOOP	1.25		
= Arabian Light price CIF LOOP	33.25	\$5.73*	(100.0)
- Quality penalty ANS vs. AL	(.35)		
= ANS value CIF LOOP	32.85	5.66	
- Tanker charges, Valdez to LOOP	(5.85)		
= ANS PRICE FOB Valdez	\$27.00	4.65	
ANS PRICE FOB Valdez		\$27.00	4.65
- Tanker charge, Valdez to Long Beach	1.75		
= ANS price CIF Long Beach	28.75	4.95	
+ Refinery margin, zero-sulfur fuel oil	2.50		
LOS ANGELES INDUSTRIAL FUEL OIL	\$31.25	5.02*	(87.6)
ANS PRICE FOB Valdez		\$27.00	4.65
+ Tanker charge, Valdez to Benecia	1.50		
ANS Price CIF Benecia	28.50	4.91	
+ Refinery margin <0.3% S residual	.95		
S.F. BAY AREA INDUSTRIAL FUEL OIL	\$29.45	4.73*	(82.6)
ANS PRICE FOB VALDEZ		\$27.00	4.65
+ Tanker charge, Valdez to Anacortes	1.10		
ANS price CIF Anacortes	28.10	4.84	
- Refinery discount >2.0% residual oil	(7.50)		
PUGET SOUND INDUSTRIAL FUEL	\$21.60	3.41*	(59.6)

*) Conversions used were 5800 btu per barrel of crude oil, 6000 for heavy gas oil, 6225 for low-sulfur residual oil, and 6325 for high-sulfur residual oil.

page twenty

Tighter air-quality regulations will make even low-sulfur residual oil generally unacceptable as boiler fuel in Southern California by 1985, but low-sulfur residual oil will remain the standard industrial fuel oil in Northern California. Sulfur content will not limit most industrial fuel-oil uses in the Pacific Northwest or the market for ship's bunker fuels. As a result, we foresee prices for industrial fuel oil in Southern California, Northern California, and the Pacific Northwest on the order of 88 percent, 83 percent, and 60 percent, respectively, of the CIF price of Arabian Light crude oil at the U.S. Gulf.

The reader should recognize that the implicit model behind this table is much simpler than the reality it tries to simulate, and that several of its assumptions are arbitrary or speculative. Some of them depend not so much on objective facts, but what people believe and how they are likely to act on their beliefs. For example, if refiners as a group overestimate the long-term price differential between distillate and residual fuel oils, as a group they will overinvest in cokers, visbreakers, etc., and cause the price differential to be narrower than the forecast, and narrower than it would have actually been without the investment.

THE FOLLOWING PAGES WERE TREATED AS
A UNIT IN THE ORIGINAL FILE.

REPORT TO CONGRESS ON ALASKAN OIL



**SECTION 126
OF THE
EXPORT ADMINISTRATION AMENDMENTS ACT OF 1985**

OVERVIEW

SECTIONS

- I. EXECUTIVE SUMMARY
- II. CURRENT STATUS
- III. EFFECTS OF CHANGES IN INCENTIVES FOR ANS PRODUCTION
- IV. POLICY OPTIONS PERTAINING TO THE LIFTING OF EXPORT RESTRICTIONS
- V. THE APPROPRIATENESS OF MAINTAINING EXPORT CONTROLS
- VI. THE IMPLICATIONS OF DECLINING OIL PRICES
- VII. FINDINGS AND RECOMMENDATION

APPENDICES

- A. ECONOMIC/ENERGY ASSUMPTIONS FOR THE ALASKAN 126 OIL STUDY
- B. SHIPPING RATES
- C. METHODOLOGY FOR CALCULATING DOMESTIC INCENTIVES FOR ANS PRODUCTION
- D. DESCRIPTION OF DOE OIL TRADE MODEL
- E. SUMMARY OF FEDERAL REGISTER NOTICE COMMENTS
- F. SECTION 126 STATUTE

CONTENTS

I.	EXECUTIVE SUMMARY.....	I-1
II.	CURRENT STATUS.....	II-1
	A. PETROLEUM ECONOMICS: GENERAL BACKGROUND.....	II-1
	1. The Origin of ANS Export Control	
	2. ANS Crude and the Current World Oil Market	
	B. EXPLORATION AND DEVELOPMENT.....	II-5
	1. Difficulties of ANS Exploration and Development	
	2. Status of Discoveries	
	3. North Slope Crude Oil Production	
	C. CURRENT LEGISLATIVE AND REGULATORY STATUS.....	II-11
	1. Introduction	
	2. The Export Administration Act of 1979 (EAA)	
	3. Energy Policy and Conservation Act (EPCA)	
	4. Mineral Lands Leasing Act (MLLA)	
	5. Naval Petroleum Reserves Production Act of 1979 (NPRPA)	
	6. Outer Continental Shelf Lands Act (OCSLA)	
	7. Short Supply Regulations	
	D. GOVERNMENT REVENUES AND EXPENDITURES.....	II-16
	1. Federal Taxation	
	2. Taxation of Oil and Gas Exploration and Production	
	3. Windfall Profit Tax	
	4. Taxation of Shipping	
	5. Federal Expenditures	
	6. State Fiscal Considerations	
	E. TRANSPORTATION AND TRADE PATTERNS.....	II-20
	1. Introduction	
	2. Legislation	
	3. Demand for Shipping Capacity	
	4. ANS Shipping Trades	
	5. ANS Trade In Recent Years	
	6. California Oil Pipelines	
	7. The All American Pipeline	
	8. The Pacific Texas Pipeline Company	
	9. Recent Changes in the Trade	
	10. Proprietary Tonnage	
	11. Militarily Useful Tankers	

F. FOREIGN POLICY.....	II-29
G. ENERGY SECURITY.....	II-31
H. EMPLOYMENT.....	II-33
III. EFFECTS OF CHANGES IN INCENTIVES FOR ANS PRODUCTION.....	III-1
INTRODUCTION.....	III-1
ASSUMPTIONS.....	III-1
A. POLICY OPTIONS AND ESTIMATES OF RESULTING CHANGES IN NETBACK PRICE.....	III-2
1. Federal and State Taxation	
2. Pipeline Tariffs	
3. Federal Leasing Policies	
B. IMPACTS.....	III-6
1. Production Impacts	
2. Federal and State Revenue Impacts	
3. Petroleum Industry Impacts	
4. Consumer Impacts	
5. Transportation Impacts	
6. Employment Impacts	
7. Trade and National Security	
8. Foreign Policy	
9. Environmental Impacts	
IV. POLICY OPTIONS PERTAINING TO ANS EXPORT RESTRICTIONS.....	IV-1
A. EXPORT TRADE FLOWS.....	IV-1
1. Domestic Energy Flows	
2. Export Trade Flows	
3. Export Markets	
B. PETROLEUM INDUSTRY IMPACTS.....	IV-14
1. Transportation Savings	
2. Wellhead Price Impact	
3. Net Producer Revenues	
4. Exploration, Development, and Production	

C. REFINING IMPACTS.....	IV-21
D. CONSUMER IMPACTS.....	IV-25
E. FISCAL EFFECTS OF EXPORT OPTIONS.....	IV-29
1. Federal Impacts	
2. State Impacts	
F. MARITIME IMPACTS.....	IV-32
1. General Description of the U.S. Tanker Fleet	
2. ANS Trade	
3. Title XI Commitments	
4. ANS Export Impacts	
5. Impact on Shipbuilding and Ship Repair Industries	
G. TRADE IMPACTS.....	IV-39
1. Changed Product Flows	
2. Crude Oil Replacement Scenarios	
3. Trade Analysis	
4. Crude Oil Impacts	
5. Conclusion	
H. EMPLOYMENT IMPACTS.....	IV-49
1. Introduction	
2. Seafaring	
3. Shipbuilding and Repairing	
4. Alaskan Oil and Gas Extraction	
5. Californian Oil and Gas Extraction	
6. Californian Refiners	
7. Gulf and East Coast Refiners	
8. Other Alaskan and Californian Industries	
I. FOREIGN POLICY IMPACTS.....	IV-55
1. Introduction	
2. International Energy Agency (IEA)	
3. Relations with Japan	
4. Relations with the Republic of Korea	
5. Relations with Taiwan	
6. Relations with Mexico	
7. Relations with Ecuador	
8. Relations with Venezuela	
9. Relations with Panama	
10. Relations with Costa Rica	
11. Relations with Western Europe and Canada	
12. Relations with the Middle East	
13. State and Energy Departments Consultative Process	
14. <u>Federal Register</u> Comments on ANS Exports	

J. NATIONAL DEFENSE IMPLICATIONS OF OIL EXPORTS.....	IV-63
V. THE APPROPRIATENESS OF MAINTAINING EXPORT CONTROLS.....	V-1
A. BENEFITS AND COST.....	V-1
1. Benefits	
a. Fiscal Revenues to Federal and State Governments	
b. Energy Efficiency and the Oil Companies	
c. Trade and Security Relations with Pacific Rim Countries	
d. Oil Impacts From Western Hemisphere	
2. Costs	
a. Oil Impacts	
b. Militarily Useful Tankers	
c. Maritime Losses	
d. Loss of Panamanian Revenue	
B. OTHER ISSUES.....	V-6
1. Oil Production	
2. Export Scenarios	
VI. IMPLICATIONS OF DECLINING OIL PRICES.....	VI-1
A. LOW OIL PRICE SCENARIO.....	VI-1
B. LOW PRICE CASE - ENERGY FLOWS.....	VI-3
1. Export Ban Scenario	
2. Unconstrained Exports Scenario	
3. West Coast Petroleum Balance	
C. PETROLEUM EXPLORATION AND DEVELOPMENT.....	VI-5
D. IMPACTS ON REFINERS AND CONSUMERS.....	VI-7
1. Export Ban	
2. Unconstrained Exports	
E. FISCAL IMPACTS.....	VI-8

F. MARITIME IMPACTS.....	VI-8
1. Export Ban	
2. Unconstrained Exports	
G. EMPLOYMENT IMPACTS.....	VI-9
H. TRADE IMPACTS.....	VI-9
VII. FINDINGS AND RECOMMENDATION.....	VII-1

APPENDIX A

ECONOMIC/ENERGY ASSUMPTIONS FOR THE ALASKAN 126 OIL STUDY.....	A-1
1. Scope/Timing	
2. Oil Price	
3. GNP	
4. Inflation	
5. TAPS Tariff	
6. North Slope Crude Oil Production	
7. Shipping Rate (U.S.)	
8. Trade Flows	
9. International Tanker Rates and Assumptions	

APPENDIX B

DOMESTIC SHIPPING RATES.....	B-1
1. Estimation of Tanker Rates	
2. Types of Charter Arrangements	

APPENDIX C

METHODOLOGY.....	C-1
1. Return to the Producer and Equivalent Valdez F.O.B.	
2. Supply Response	
3. Base Case and Policy Option Calculations	
4. Estimation of Labor Impacts	
5. Base Case and Policy Option Tables	

APPENDIX D

DESCRIPTION OF DOE OIL TRADE MODEL.....D-1

APPENDIX E

SUMMARY OF FEDERAL REGISTER NOTICE COMMENTS.....E-1

1. Introduction
2. Exploration and Development
3. Federal and State Revenues
4. Consumers
5. Employment
6. Refining Industry
7. Shipping
8. Trade
9. Foreign Policy
10. National Security
11. Postscript

APPENDIX F

SECTION 126 STATUTE.....F-1

EXECUTIVE SUMMARY

I. STATUTORY BACKGROUND

Section 126(a) of the Export Administration Amendments Act of 1985 requires the President to undertake a comprehensive review of issues concerning (1) possible changes in the existing incentives to produce crude oil from Alaska's North Slope (ANS) including changes in taxation, pipeline tariffs and leasing policies; (2) possible changes in existing distribution of ANS crude oil at free market levels and at levels of 50,000, 100,000, 200,000 and 500,000 barrels per day (MB/D); and (3) the appropriateness of continuing existing controls.

Section 126 further requires that these possible changes be evaluated in light of the impacts on the following:

- Energy and national security of the United States and its allies;
- U.S. foreign policy;
- Employment in the maritime, oil and related industries;
- Consumers and refiners;
- Revenues and expenditures of the Federal Government and the State of Alaska;
- Incentives for oil and gas exploration and development in the United States; and
- U.S. trade relations in general and with individual countries in particular.

II. INTERAGENCY STUDY PROCESS

Responsibility for developing this report was delegated to the Department of Commerce (DOC). Analysis of all the above issues is based on input from a DOC chaired interagency task force that included the Departments of Energy, Defense, State, Labor, Transportation, Treasury, and Interior, as well as the National Security Council and the Office of Management and Budget.

The report is based on a number of agreed economic assumptions regarding future ANS crude oil production, crude oil price levels, domestic and foreign shipping rates, as well as a number of factors such as economic growth rates and inflation.

The main body of the report was developed before the recent decline in world oil prices. Petroleum industry experts cannot project reliably how long these low prices will prevail. Nevertheless, it was agreed that this study should include an additional chapter which highlights any changes to the previous analysis based on \$15 per barrel oil prices through 1990.

This report also incorporates comments submitted by interested parties in response to a December 9, 1985 DOC Federal Register Notice.

III. CHANGES IN EXISTING INCENTIVES TO PRODUCE ANS CRUDE OIL

Any change that directly or indirectly raises the profitability of production would potentially increase incentives to explore for and produce ANS crude oil. The analysis in this study focused on the following examples of possible changes to the existing incentives to produce ANS crude oil:

- Reduced pipeline tariffs based on the Trans-Alaska Pipeline Settlement (TAPS) of October 1985;
- Exemption of ANS crude from the Federal Windfall Profits Tax;
- Reduction of the State of Alaska severance tax rate by 25 percent and 50 percent;
- Reduction of the Federal royalty rate by 25 percent and 50 percent.

Between 1987 and 2000, increases in production stemming from the incentives listed above would be almost entirely due to increased recovery from existing wells. Given the long lead times to develop new fields on the Alaskan North Slope, new wells from new fields would not begin producing until at least the late 1990's.

Of the incentives noted above, the TAPS Pipeline settlement is projected to have the largest impact on production. Assuming a mid-point price path (i.e., \$32.50 in the year 2000), increased production would likely be about 75,000 barrels per day (B/D) by 2000. This amounts to about a 5 percent increase in production.

The TAPS Settlement also has a significant revenue impact. It is estimated to reduce Federal revenues through the year 2000 by about \$3 billion but is projected to increase the State of Alaska's revenues by about \$8.6 billion. The marked disparity in revenue impacts arises from the substantial increase in State of Alaska royalty and severance taxes.

Reduction of the State of Alaska severance tax rate would significantly reduce state revenues, but would not have a large impact on production. A 50 percent reduction in the tax rate would reduce state revenues by \$9 billion but would result in additional production of only 24,000 B/D by 2000.

Significant oil production from Federal leases is not expected to occur before 2000 regardless of the incentives to produce. Therefore, reductions in the Federal royalty rate would not have a large impact on producer revenues or production between 1987 and 2000.

Because the production responses would be small, other economic impacts from these incentives (on shipping, producers, consumers, etc.) would also be small.

It is also important to note that, under low oil prices, incentives to produce ANS crude would have a greater impact on preserving existing production than on new exploration and development.

IV. POLICY OPTIONS PERTAINING TO ANS EXPORT RESTRICTIONS

At present, ANS crude oil production of about 1.8 million barrels per day (MMB/D) is consumed in the United States due to the statutory export ban. Of this total, 1000 MB/D of ANS production is shipped to the West Coast; 630 MB/D is shipped to the East and Gulf Coasts, and 128 MB/D is shipped to the Virgin Islands and Puerto Rico.

This section examines the oil flow redistributions and economic/policy impacts that such redistributions would have if the export ban were removed. This section also examines the impact of partial export decontrol at levels of 50, 100, 200 and 500 thousand barrels per day (MB/D).

A. Trade Flows

The actual level of exports will be determined by demand for ANS crude in U.S. West Coast and Pacific Rim markets. Export levels projected in this study represent maximum volumes based on the DOE Oil Trade Model. Actual export levels could be more or less depending upon market circumstances.

If the export ban were removed, shipments to the West Coast would remain relatively stable declining to a low of 830 MB/D in 1990 and increasing to 1040 MB/D by the year 2000. However, shipments to other U.S. destinations would be phased out by 1990 and the rest of ANS production would be exported to Pacific Rim countries.

It is anticipated that peak exports would reach 870 MB/D by 1990 and decline significantly after that due to falling ANS production and increased West Coast demand for ANS crude. By the year 2000, exports are projected to be about 360 MB/D.

B. Economic and Policy Impacts

This study examines the general economic efficiencies as well as sectoral/public policy impacts of removing the ban on ANS crude oil exports. Overall, a lifting of the ban would reduce government caused economic distortions and inefficiencies, and result in general welfare gains, but would have a negative impact on several particular sectors.

-- Petroleum Industry

At present, petroleum producers ship ANS crude to U.S. destinations only on American flag vessels as required by the Jones Act. Removal of the ban would permit producers to use foreign vessels to export ANS crude. This would reduce transportation costs significantly because (1) foreign shipping rates are lower than U.S. rates, and (2) Pacific Rim markets are closer to Alaska than the U.S. Gulf and East Coast markets. The savings from reduced transportation costs would translate into higher wellhead prices for producers.

ANS crude oil exports would also increase the value of California crude that is currently depressed due to the surplus in that market. At present, ANS crude sells at a discount on the West Coast to be price competitive. With other markets available for ANS crude, the "West Coast Discount" would disappear and prices of all oil would rise.

Using a mid-point price estimate for crude oil, the removal of the export ban would increase producer profits by \$3.7 billion in Alaska and by \$4.0 billion in California over the 1987-2000 time frame. If current low oil prices prevail, the transportation component will represent a larger part of the wellhead price. Lifting the export ban and increasing the wellhead price by approximately \$1.75 per barrel will provide important economic incentives for some current ANS as well as California oil production. It may prevent some producers from having to shut-in crude oil production.

If oil prices recover and reach the levels projected in this study, higher FOB netback prices would also provide some incentives for increased production in California and Alaska. This study estimates that, by 2000, increased production responses to the removal of the export ban could be at least 5-15 MB/D in Alaska and 12-24 MB/D in California. Beyond 2000, production responses could be higher.

-- Refining Industry

At present, West Coast refiners benefit from the captive supply of ANS crude which also serves to depress the price of California crude oil. A lifting of the export ban will raise the refiners' crude oil acquisition costs.

Some government analysts project long-term benefits to the refinery industry if they import light crude to replace heavy ANS supplies. This will lead to greater refinery efficiencies and processing gains. Further, refiners would be able to forego the additional expenses of converting their facilities to continue processing California heavy as well as ANS crude.

-- Consumers

In the short run, it is anticipated that the decontrol of ANS crude exports would raise petroleum product prices, particularly for residual fuel oil, on the West Coast consumers. Refiners would pay more for crude oil on the West Coast and would pass those costs along to consumers. Consumers on the Gulf Coast are unlikely to be adversely affected.

Some government analysts believe that consumers would benefit in the long run. As previously noted, market forces will increase the price of ANS and California crudes and thereby provide incentives for increased production. This would tend to depress world oil prices over time and result in lower petroleum products prices for U.S. consumers.

-- Federal and State Revenues

Removal of the export ban will increase the wellhead price of crude oil in Alaska and California and thus increase both Federal and State tax revenues. This study projects that Federal revenues will grow by \$4.6 billion; Alaskan revenues by \$4.0 billion; and California revenues by \$1.6 billion during the 1987-2000 period. (These revenue projections would be reduced under partial decontrol scenarios and/or if current low oil prices persist.)

-- Maritime Industry (Including Militarily Useful Tankers)

The removal of the export ban would have a significant negative impact on the U.S. flag tanker fleet and the industries that support it.

Of the 10.7 million deadweight tons (DWT) of tankers active under the U.S. flag as of October 31, 1985, about 60 percent were employed in the distribution of ANS crude. This study estimates that removal of the export ban will lay-up over 30 tankers totalling over 4 million DWTs, exposing approximately \$382 million of Title XI Federally guaranteed mortgages to default.

In addition, the private sector (oil companies owning tankers and private tanker owners) could be subject to an additional default of approximately \$540 million.

The Federal Government might also have additional costs associated with assuring adequate tankers for national defense of as much as \$34 million to purchase displaced militarily useful tankers. Absent these acquisitions, the shortage of U.S. flag tankers that would transport military mobility fuels during a crisis would increase.

Removal of the export ban could likewise have a negative impact on the U.S. shipbuilding and repair industry. Future ship construction opportunities could be reduced by about \$1.5 billion and maintenance and repair operations could be reduced by about \$392 million during the 1987-2000 time frame.

-- Trade

The balance of trade implications of ANS crude oil exports depend on a number of economic variables.

On the one hand, the U.S. could realize a net positive change in its trade balance if crude oil exports are not replaced on a barrel for barrel basis with imports. Under such a scenario, lifting the ANS ban provides economic incentives for producers to export crude rather than discounting ANS crude on the West Coast. Not only is it more profitable for ANS producers to export crude oil, West Coast refinery operations would be made more efficient by reducing heavy oil supplies. (At present, residual fuel exports are permitted while crude exports are restricted.) This will result in less residual fuel production on the West Coast which leads to higher prices. Higher residual fuel prices will reduce domestic demand by about 60 MB/D in 1995. Further, imports of light crudes rather than heavy oils result in large West Coast refinery processing efficiencies that reduce the need to replace exports on a barrel for barrel basis.

On the other hand, there are factors which could lead to a net negative change in the trade balance. This scenario is based on the presumption that oil exports are sold on an FOB Valdez, Alaska basis and carried on foreign vessels. This oil is replaced on a barrel for barrel basis by oil imports that are carried on foreign tankers. Thus, the United States would lose the transportation costs of each transaction. (This transportation based deficit would be reduced if the ban were partially lifted and/or if U.S. vessels carried part of the oil.)

-- Employment

Removal of the export ban would have the greatest impact on seafaring employment. This study estimates that displacements could be as high as 52 percent of the U.S. tanker workforce (about 2000 workers). Displaced seafarers would have difficulty finding work in other types of shipping since employment opportunities in the U.S. Merchant Marine at large are poor. There would also be major displacements in the shipbuilding and repairing industries. Some of these negative impacts may be offset by employment gains in the oil and gas extraction and supporting industries. If low oil prices persist, lifting the ban could prevent the shut-in of ANS and California oil production and thereby preserve existing oil production related jobs.

-- Foreign Policy

The Administration has strongly urged the International Energy Agency to support an open trading system in which market forces determine prices and the movement of goods internationally. The International Energy Agency has developed a consensus that reliance on market forces is an effective means to promote stability and energy security. Lifting the ban on ANS crude oil exports would be consistent with these objectives.

Crude oil exports could improve bilateral trade balances with Pacific Rim countries.

ANS exports could contribute to obviating the need to transship crude through the Panama pipeline depending upon the strength of Gulf Coast demand for ANS crude. However, lifting the ban would increase oil export opportunities for other Latin American countries. The impact on the Panamanian economy would be negative, but the impacts on Ecuador, Venezuela, and Mexico would be positive.

-- National and Energy Security

Lifting the ban diversifies oil imports and could improve the energy security of Pacific Rim countries which are heavily dependent on Persian Gulf supplies. It might also provide incentives for these countries to expand overall energy and trade cooperation with the United States.

However, large ANS crude oil exports during the 1990s could require offsetting oil imports and increase U.S. dependence on OPEC sources. While the sources and reliability of U.S. oil supplies would change, lifting the ANS ban could result in a slight decline in net oil imports because of increased domestic oil output.

If the export ban is lifted, a number of U.S. flag tankers would be forced out of business. This would aggravate the shortage of militarily useful U.S. flag tankers to carry clean petroleum products for the military during national emergencies.

V. APPROPRIATENESS OF CONTINUING EXPORT CONTROLS

The Administration believes that reliance on market forces is the most effective means to promote U.S. energy security. While lifting the ban on Alaskan crude oil exports would be in line with this objective, some government analysts point out that a number of other factors must be taken into consideration when making such a determination.

Lifting the ban on Alaskan crude oil exports would have consequences for a number of domestic interests and should also be evaluated based on institutional considerations that have developed since the Congress passed the Trans-Alaska Pipeline Authorization Act in 1973.

A partial lifting rather than full lifting of the ANS crude export ban could pose a number of administrative and commercial difficulties. The U.S. Government would find itself in the position of allocating limited export volumes rather than allowing the market to make these determinations.

Finally, it is important to note that this study only evaluates the implications of removing or modifying export controls on ANS crude oil -- it does not address the costs and benefits of export controls on other domestically produced crude oil. From a public policy perspective, removal or modification of export controls on ANS crude should be considered in the context of overall restrictions on crude produced in the lower 48 states.

VI. RECOMMENDATION

An interagency review has been conducted of the analytical and technical findings of the study and the following is recommended: that the appropriate Federal agencies continue to review the prospects for Alaska North Slope exports, in light of changing energy market conditions. During this continuing review process, the appropriate Federal agencies will consult with the owners of the oil, including the State of Alaska, the maritime industry, and other interested parties.

II. CURRENT STATUS

This chapter provides a background discussion of the current situation with respect to Alaskan North Slope (ANS) oil production, transportation and use. Note that the discussion throughout this report pertains only to ANS crude oil. Crude oil production in southern Alaska -- primarily in the Cook Inlet area -- is excluded from the discussion and analysis.

A. PETROLEUM ECONOMICS: GENERAL BACKGROUND

1. The Origin of ANS Export Controls

The discovery of oil in the Prudhoe Bay region of northern Alaska in 1968 revealed the presence of the largest field ever found in the United States. The field contained approximately 10 billion barrels of recoverable oil, an amount that would substantially help stem rising oil imports and offset declining production in the lower 48 States. However, to achieve these economic benefits, the oil would have to be transported to the marketplace. A controversy, therefore, arose over the route by which the oil would be transported.

Two competing proposals were advanced for transporting ANS crude to the domestic market. One was a pipeline across Canada into the midwestern United States. The second was an all-Alaska line to carry oil from Prudhoe Bay to a terminal at Valdez, Alaska, for tanker shipment to U.S. markets. It was also envisioned that, after shipment from Valdez, some of the ANS crude could be moved by pipeline from Washington State to markets in the Midwest. This proposed West-to-East pipeline, the Northern Tier pipeline, was never built.

The proposed land route from Alaska and across Canada was considerably more expensive and had potentially more severe environmental impacts than the all-Alaska route to Valdez (the Trans-Alaska Pipeline System - TAPS). Therefore, Congress decided on the Prudhoe Bay to Valdez route when it passed the Trans-Alaska Pipeline Authorization Act in 1973.

In order to obtain Congressional support, the TAPS bill was amended to make ANS crude available only for domestic consumption. There were significant concerns by many who thought that a pipeline to Valdez would provide an incentive for ANS crude to be exported to the Far East rather than transported to domestic markets. The ANS export restriction satisfied the concerns of those who had experienced serious shortages during the Arab oil embargo and who wanted to ensure the availability of ample, reasonably-priced petroleum supplies. Subsequent legislation strengthened the export

restrictions and no ANS crude oil has ever been available for export. However, petroleum products refined from ANS crude have been and remain eligible for export.

The export controls imposed on ANS crude provided incentives for several North Slope oil producers to purchase their own U.S. flag ships. Since the Merchant Marine Act of 1920 (commonly known as the Jones Act) requires that all cargo between U.S. ports be transported on U.S. vessels, all foreign tankers are excluded from the ANS crude trade. (Foreign flag tankers are allowed in the ANS trade to the Virgin Islands under Section 21 of the Merchant Marine Act, 1920.) Thus, several domestic producers have also become shippers and have developed institutional trading relationships with various U.S. consumers.

2. ANS Crude and the Current World Oil Market

Both international and domestic oil markets are substantially different today from what they were in the 1970s when restrictions were imposed on ANS oil exports. Internationally, we have moved away from a world oil market dominated by the Organization of Petroleum Exporting Countries (OPEC) and characterized by tight supplies and sharp oil price hikes. Today's market, by contrast, has excess production capacity and falling oil prices. OPEC no longer has a stranglehold on crude oil trade, having seen its share of world crude oil production fall from 56 percent in 1973 to about 30 percent in 1985. Non-OPEC production increased by 50 percent over the same period.

Domestically, we have shifted from an era of government price regulations and supply allocations to one of oil price decontrol and distribution according to market forces. Since the removal of U.S. crude oil price controls in January 1981, crude oil prices have declined significantly and domestic production has modestly increased.

In addition, our energy security has been enhanced by the storage of about 496 million barrels of crude oil in the Strategic Petroleum Reserve (SPR). With net crude oil and product imports now at about 4 million barrels per day, the SPR could replace our import requirements for about 120 days -- a considerable improvement over conditions in 1973-74 when we had no oil in strategic storage.

Despite the changing world oil market and U.S. energy security considerations, ANS crude remains subject to export restrictions. In the case of ANS production, the crude oil must first move by pipeline to Valdez (small quantities are taken out of the pipeline for local refineries near Fairbanks and Anchorage), where it is loaded on tankers. Any crude oil not processed in Alaska must then be shipped to other ports in the United States. As a result of the ban on exports, tanker transportation costs are an important factor in the delivered price.

As previously noted, the Jones Act requires that all shipping between U.S. ports must be transported by U.S. flag carriers, whose rates are substantially higher than foreign tanker rates on comparable routes. If there were no restrictions on exports, those producers of ANS oil who do not own U.S. flag vessels would normally seek to maximize profits by selling crude oil in nearby foreign markets, where transportation costs would not put them at a disadvantage. However, the ban on exports denies ANS producers some nearby markets along the Pacific Rim and obliges them to use costly U.S. flag carriers. Of necessity, the ANS producers have had to ship their crude farther and at a greater per barrel cost than they would under free market conditions. These two factors have reduced the prices received by producers (see Table A-1). Moreover, the flow of ANS oil into the California market has created an oversupply that has depressed the value of both Alaskan and Californian crude.

TABLE A-1WELLHEAD PRICE OF ALASKANNORTH SLOPE CRUDE

(1985 DOLLARS/BARREL)

<u>Estimated 1985</u>	<u>California/West Coast</u>	<u>Gulf Coast</u>
DELIVERED AVERAGE PRICE NORTH SLOPE CRUDE OIL	\$ 24.28	\$26.98
<u>LESS:</u>		
SHIPPING COST	<u>\$ 1.30</u>	<u>\$ 4.46</u>
VALDEZ F.O.B. PRICE	\$22.98	\$22.52
<u>LESS:</u>		
TAPS PIPE LINE TARIFF	<u>\$ 6.11</u>	<u>\$ 6.11</u>
NORTH SLOPE NETBACK WELLHEAD PRICE *	\$16.87	\$16.41

Source: Petroleum Intelligence Weekly, Vol. XXIV, No.25, June 24, 1985, p.2

* Price at Pump Station #1

B. EXPLORATION AND DEVELOPMENT

1. Difficulties of ANS Exploration and Development

The Alaskan North Slope is one of the world's harshest environments for crude oil exploration and development. Normal temperatures vary from -6 to -24 degrees Fahrenheit (F) on the North Slope and extremes in temperature vary between -50F to +30F. In addition to the extreme cold, the winter months are always dark because the sun sets in late November and does not rise again until the end of January.

Despite the harshness of the cold weather months, most exploration and development activity has to take place in winter for the following reasons:

- o No drilling or movement of equipment on the tundra is allowed between late April and late November because the permafrost, which softens in the warmer temperatures, might be damaged.
- o No offshore activities are allowed during April and September because of the possibility of adverse effects on the migration of bowhead whales.
- o No onshore activities are allowed during mid-May to mid-July to avoid disturbing the caribou during calving season.

Also, there are a number of other regulations by the Environmental Protection Agency and State fishery and wildlife groups that also restrict oil exploration and development.

As a result of the harsh climatic conditions and government restrictions on exploration and development of the North Slope, there is a 10 to 15 year average delay between the discovery of an oil field and the start of production. For example, Prudhoe Bay (the Sadlerochit Reservoir) was discovered in 1968, but significant production did not start until 1978.

Due to the harsh environment, North Alaskan exploration and development costs are significantly higher than in other parts of the United States. Section III of this report evaluates a variety of incentives to overcome these difficulties and to increase North Slope oil production.

2. Status of Discoveries

Table B-1 shows estimated crude oil reserves on the North Slope by major field and year of discovery. Current proven reserves equal nearly 7.9 billion barrels, with about 75 percent in the Sadlerochit Reservoir of the Prudhoe Bay Field. It is estimated that between 5.8 to 18.0 billion barrels remain to be discovered in the North Slope area.

In 1984, the most recent year for which data exist, crude oil reserves for Alaska increased over 250 million barrels, primarily due to positive revisions in reported reserve estimates for North Slope fields. Most of these revisions were the result of increased secondary recovery projects in producing fields, including expansion of waterfloods and the construction start-up of a miscible-phase gas injection project in the Sadlerochit Reservoir of the Prudhoe Bay Field. Other significant additions to reserves were reported in older fields for which development plans had been uncertain until 1984.

Discovery of the "giant" Seal Island Field, in 40 feet of water, five miles offshore in the Beaufort Sea, was announced in January 1984. The field is about one mile northwest of the Prudhoe Bay Field, with reserves expected to reach about 300 million barrels.

Seal Island was the first commercial discovery reported in the Beaufort Sea. Its operator hopes to begin production by 1992.

Plans were announced in 1984 to drill up to 180 wells and fully develop the Lisburne Reservoir, which was discovered in 1968 by the same well that discovered the Prudhoe Bay Field. The Lisburne Reservoir underlies the main Sadlerochit Reservoir in the Prudhoe Bay Field. Production on a large scale is planned for late 1986 or early 1987, increasing to about 100,000 barrels of oil per day in 1987. Ultimate recovery from Lisburne is estimated at 140 million barrels, a small fraction (about 5 percent) of the estimated 3 billion barrels of original oil-in-place.

Planned development of the Endicott Reservoir was also announced in 1984. The reservoir is in the Sag River-Duck Island Unit east of the Prudhoe Bay Field. Reserves are estimated at up to 375 million barrels and production should start-up in 1988 at about 100,000 barrels of oil per day. Producers at Milne Point, a 1980 discovery, have put a hold on the second phase of development due to lower oil prices. It is an extension of the Kuparuk River and West Sak formations north of the Kuparuk River Fields, located on State lands about 35 miles northwest of the Prudhoe Bay Field. A pipeline will connect the unit's production to the Trans-Alaska Pipeline

System through existing pipelines serving the Kuparuk River Field. Early in 1986, Milne Point was producing about 20,000 barrels per day of crude oil.

Enhanced recovery projects continue to be developed on the North Slope. Production began from the West Sak unit late in 1984, where hot water is now being injected into the reservoir. West Sak overlies a large portion of the Kuparuk River Field and was discovered in 1969 at the same time the Kuparuk River Field was found. Kuparuk River began production in 1981. A fivefold expansion of the first Arctic tertiary project, an enriched gas miscible flood system in the Prudhoe Bay Field, was approved by operators and the expansion phase construction has begun. Over 100 million barrels of additional recovery are anticipated with full-scale operation scheduled for late 1986 or early 1987.

3. North Slope Crude Oil Production

Table B-2 provides data on North Slope oil production by major field from 1975 to 1985. The Sadlerochit Reservoir has been the predominant source of North Slope oil production, accounting in 1985 for nearly 90 percent of total Alaskan production. Technical Appendix A provides the range of projected Alaskan North Slope oil production estimates (through the year 2000) used in this study.

Table B-3 shows Alaskan North Slope crude oil production by company for 1984. Nearly half the production was by Sohio, which produced nearly 800 thousand barrels per day.

TABLE II B-1

ESTIMATES OF NORTH SLOPE CRUDE OIL RESERVES
(Billion Barrels)

<u>Name of Field</u>	<u>Year Discovered</u>	<u>Estimated Recoverable Reserves*</u>
Prudhoe Bay	1968	5.0-7.2
Kuparuk River	1969	0.8-1.3
Milne Point	1980	.04-0.1
West Sak	1969	3.0-5.0
Endicott	1969	0.3-0.5
Lisburne	1968	0.3-0.6
Ugnu	1969	0.0-3.0
Point Thompson	1981	0.3-0.6
Colville River Delta	1985	**
Gwydyr Bay	1984	.00-.06
Seal Island	1984	**
Undiscovered Fields*** (Onshore)	---	2.5-14.6
Total North Slope		12.2-34.0

* Estimated Recoverable Reserves includes potential as well as proved reserves; total North Slope proved reserves were nearly 7.1 billion barrels as of 1986.

** Not yet determined to be commercial.

*** Department of Interior, Geological Survey Circular 860, Estimates of Undiscovered Recoverable Conventional Resources of Oil and Gas in the United States, 1981. This estimate does not include 3.3 billion barrels of Alaskan offshore crude oil determined by the Department of the Interior, Minerals Management Service in 1984.

TABLE II B-2

CRUDE OIL PRODUCTION
(B/D)

	<u>North Slope</u>				<u>South</u>	<u>State</u>
	<u>Kuparuk</u>	<u>Prudhoe</u>	<u>Milne</u>	<u>Total</u>	<u>Alaska</u>	<u>Total</u>
	<u>River</u>	<u>Bay</u>	<u>Point</u>	<u>ANS</u>		
1975	-0-	7,863	-0-	7,863	189,342	197,205
1976	-0-	12,614	-0-	12,614	170,973	183,587
1977	-0-	315,775	-0-	315,775	153,685	469,460
1978	-0-	1,089,532	-0-	1,089,532	137,345	1,226,877
1979	-0-	1,283,321	-0-	1,283,321	117,597	1,400,918
1980	-0-	1,521,627	-0-	1,521,627	99,307	1,620,934
1981	2,992	1,521,019	-0-	1,524,011	85,137	1,609,148
1982	88,784	1,531,773	-0-	1,620,556	75,099	1,695,655
1983	109,258	1,536,778	-0-	1,646,036	67,844	1,713,880
1984	126,490	1,540,400	-0-	1,666,890	60,233	1,727,123
1985	215,345	1,554,444	2,411	1,772,200	47,203	1,819,403

Kuparuk River includes a small amount of production from Kuparuk River (West Sak) for 1983 and 1984.

Prudhoe Bay production into Trans Alaska Pipeline began fourth quarter of 1977. Includes condensate. Prudhoe Bay (Lisburne) included 1981-1985.

Milne Point production began November 4, 1985.

South Alaska production calculated by subtracting ANS production from State total after rounding.

1985 figures are estimated, based on actual production through 1985 except for Milne Point, which is based on November production.

NOTE: The above data are from final corrected figures of the State of Alaska Oil and Gas Conservation Commission through 1984.

TABLE II B-3

ALASKAN NORTH SLOPE CRUDE OIL PRODUCTION
BY PRODUCING COMPANY - 1984
 (Thousand B/D)

<u>Name of Company</u>	<u>North Slope Oil Production</u>	<u>Percent of Total</u>
Sohio	788	47.3
Atlantic Richfield	406	24.3
Exxon	333	20.0
British Petroleum	36	2.2
Mobil Corporation	32	1.9
Phillips Petroleum	32	1.9
Others (Amerada Hess, Louisiana Land & Exploration, Marathon, Shell, Texaco, and Unocal	39	2.4
<u>Total</u>	1,667	100.0

NOTE: North Slope production includes production from Prudhoe Bay and from Kuparuk. In 1984, Prudhoe Bay and Kuparuk had daily production of 1,540,000 and 127,000 barrels respectively.

C. CURRENT LEGISLATIVE AND REGULATORY STATUS

1. Introduction

Congress has placed a number of statutory restrictions on the export of U.S. crude oil. These restrictions are:

- o Section 7 of the Export Administration Act of 1979, as amended (50 U.S.C. App. 2406);
- o Section 103 of the Energy Policy and Conservation Act (42 U.S.C. 6212);
- o Section 28(u) of the Mineral Leasing Act of 1920 (30 U.S.C. 185), as amended by the Trans-Alaska Pipeline Authorization Act of 1973 (43 U.S.C. 1652);
- o Section 201 of the Naval Petroleum Reserve Production Act of 1976 (10 U.S.C. 7430);
- o Section 28 of the Outer Continental Shelf Lands Act of 1953 (43 U.S.C. 1343).

The main reason for this legislation was Congressional concern about the adequacy of oil supplies for the U.S. domestic market and the maintenance of low oil prices under the then prevalent price controls. It was widely held that any exports of price-controlled crude would have to be replaced by higher priced imports, which would raise consumer prices and add to inflationary pressures. Congress was also concerned about growing U.S. dependence on foreign oil supplies and wanted to ensure that U.S. crude oil reserves were utilized to reduce import dependence.

2. The Export Administration Act of 1979 (EAA)

The Export Administration Act of 1979, as amended, is the principal statute that restricts the export of Alaskan North Slope of (ANS) crude oil. It applies the most stringent conditions of any legislation that restricts crude oil exports. Specifically, Section 7(d) of the EAA effectively prohibits the export of ANS crude oil unless it is pursuant to a bilateral international oil supply agreement entered into by the United States before June 25, 1979, or to any country pursuant to the International Emergency Oil Sharing Plan of the International Energy Agency. Section 7(d) does allow for ANS crude exports if the President makes certain findings and recommends to the Congress that exports be allowed, and thereafter obtains express Congressional approval within 60 days of the recommendation. The President must find that exports of crude oil:

- o will not diminish the total quantity or quality of petroleum refined within, stored within, or legally committed to be transported to and sold within the United States;
- o will, within three months of the initiation of the exports, result in lower acquisition costs for the domestic refiners if they must purchase imported crude oil to replace such exports, and of that savings not less than 75 percent will be passed on to the consumers through wholesale and retail mechanisms;
- o will be made only pursuant to contracts which may be terminated if the crude oil supplies of the United States are interrupted, threatened, or diminished;
- o are clearly necessary to protect the national interest; and
- o are in accordance with the provisions of the EAA.

The consumer's savings test significantly impedes the President's discretionary authority to allow crude oil exports. Congress must adopt a joint resolution agreeing with the President within 60 days.

Section 7(d)(2) does allow for crude exports based upon exchanges with adjacent foreign countries to achieve increased efficiency of transportation. Crude exchanges, however, remain subject to the five conditions set forth above.

In spite of substantial improvement during the 1980s in the world energy outlook in general and in the U.S. forecast in particular, the Congress recently passed the Export Administration Amendments Act of 1985 (EAAA). The EAAA continued and strengthened the restrictions on the export of ANS crude oil. In fact, while the EAAA runs for three years, the ban on ANS crude oil exports (Section 7(d)) was extended for five years.

3. Energy Policy and Conservation Act (EPCA)

Section 103 of the Energy Policy and Conservation Act generally requires the President to prohibit the export of domestically produced crude oil, subject to certain possible exceptions. Should the President determine that the export of crude oil is in the national interest and consistent with the purposes of EPCA, a national interest finding may be made by the President and such oil can be exported. Authority to make such findings has been delegated to the Secretary of Commerce.

Under this legislation, a national interest finding on crude oil must take into account the need to leave uninterrupted or unimpaired exchange agreements with persons or governments of a foreign state; temporary exports for convenience or increased efficiency of transportation across parts of an adjacent foreign state; and "the historical trading relations of the United States with Canada and Mexico."

4. Mineral Lands Leasing Act (MLLA)

Domestic crude oil that is transported by pipeline over rights-of-way granted under Section 28(u) of the Mineral Leasing Act (MLA) of 1920 is subject to all the limitations and licensing requirements of the EAA. Should the President desire to export such crude oil, he must make and publish an express finding that the export will not diminish the quantity or quality of petroleum available to the United States, is in the national interest, and is in accordance with the EAA. Exempt from these restrictions is crude oil that is exchanged with adjacent foreign states or temporarily exported across adjacent foreign states for convenience or increased efficiency.

If the President makes the findings necessary to authorize an export, he must submit a report to Congress. After receipt of the report, Section 28(u) provides that Congress has 60 days to pass a concurrent resolution of disapproval. Of course, such a provision now is recognized as unconstitutional under the Supreme Court's decision in Immigration and Naturalization Service v Chadha, 462 U.S. 919 (1983).

5. Naval Petroleum Reserves Production Act of 1976 (NPRPA)

The Naval Petroleum Reserves Production Act of 1976 requires any petroleum produced from the Naval Petroleum Reserves to be subject to all of the limitations and licensing requirements of the Export Administration Act. Before any petroleum from the Naval Petroleum Reserve may be exported, the President must make and publish an express finding that such exports will not diminish the total quality or quantity of petroleum available to the United States, are in the national interest, and are in accord with the EAA. Two limited exceptions are available: exchange agreements with adjacent foreign states, and temporary export for convenience or increased efficiency of transportation across parts of an adjacent foreign state.

6. Outer Continental Shelf Lands Act (OCSLA)

Section 28 of the Outer Continental Shelf Lands Act states that the export of any oil or gas produced from the outer Continental Shelf shall be subject to the requirements and provisions of the EAA.

Should the President want to export crude oil subject to the OCSLA, he must make and publish a finding that such exports will not increase reliance on imported oil or gas, are in the national interest, and are in accord with the provisions of the EAA.

If the President makes the findings necessary to authorize exports, he must submit a report to Congress, which has 60 days to pass a concurrent resolution of disapproval. Again, this provision would be unconstitutional under the decision in Chadha cited earlier.

Exempt from these restrictions are:

- o oil that is exchanged in similar quantity for convenience or increased efficiency of transportation with persons or the government of a foreign state;
- o oil that is temporarily exported for convenience or increased efficiency of transportation across parts of an adjacent foreign state and reenters the United States;
- o oil that is exchanged or exported pursuant to an existing international agreement.

7. Short Supply Regulations

The Short Supply Regulations contained in the Export Administration Regulations (15 CFR 377) implement the statutory restrictions set forth above. These regulations prohibit the export of crude oil except for the following special situations:

- o temporary exports of crude oil being exported for convenience or increased efficiency of transportation across parts of an adjacent foreign state, and reentering the United States in the same form;
- o equivalent importation of crude oil that will result directly in the importation into the United States of an equal or greater quantity of that same commodity;

D. GOVERNMENT REVENUES AND EXPENDITURES

1. Federal Taxation

Firms and individuals who produce, transport, refine or market Alaskan North Slope oil are subject to income taxation. In addition, the Windfall Profits Tax applies to production from some fields, and other tax levies such as state royalty, severance and corporate income taxes also affect production decisions. However, on the Federal level, only the crude oil Windfall Profit Tax and the corporate income tax on Alaskan oil production and transportation need be examined in detail; the policy alternatives examined in this study have little effect on the revenues derived from other measures.

2. Taxation of Oil and Gas Exploration and Production

The Federal tax system provides significant incentives related to capital recovery for oil exploration, production, and transportation. These incentives apply generally to all domestic oil and shipping activity. The most significant are intangible drilling costs and percentage depletion, which currently allow certain taxpayers to claim a deduction equal to 15 percent of gross sales on up to 1,000 barrels per day. At this time, the percentage depletion incentive does not apply to North Slope production because the Tax Reduction Act of 1975 denied its benefits to integrated companies, which is the only type of oil companies currently operating on the Alaskan North Slope.

Intangible drilling costs (IDCs) include all expenditures other than for the purchase of tangible property incident to and necessary for the drilling and preparation of wells for production. They may generally be written off when incurred or "expensed." Integrated companies may only expense 80 percent of such costs attributable to successful wells; the remaining 20 percent of the IDCs must be capitalized and recovered through depreciation. Since IDCs make up a large proportion (about 65-85 percent) of the costs associated with successful wells, and nearly all of the costs of unsuccessful wells, the ability to expense them currently rather than to recover them over the life of the well provides an incentive for oil exploration and development.

There is also an investment incentive whenever capitalized expenditures can be recovered in less than the full life of the investment. Capitalized intangible drilling costs may be amortized over 36 months, thereby providing accelerated cost depletion. Tangible drilling costs (e.g., the cost of casing and valving), and lease equipment costs, which must be capitalized, are eligible for 5 year recovery under the Accelerated Cost Recovery System (ACRS), and also qualify for a 10 percent investment tax credit (ITC).

Investments in oil and gas pipeline facilities would generally be recoverable over 10 years and also qualify for the ITC. Lease bonus payments and pre-acquisition geological and geophysical expenses must be capitalized and recovered through cost depletion (depreciation).

Qualified tertiary injection expenses may also be expensed. These expenses are the amounts paid for any tertiary injectant (other than a recoverable hydrocarbon) that is used as part of an enhanced recovery process.

3. Windfall Profit Tax

Except as specifically exempted by statute, crude oil produced in the United States is subject to Windfall Profit Taxation at varying rates dependent upon the age of the producing field, method and volume of production and quality of crude. Oil produced from the Sadlerochit and West Sak Reservoirs at Prudhoe Bay, with the exception of State royalty oil, is subject to the Windfall Profits Tax. Oil produced from other reservoirs north of the Arctic Circle were exempted by statute. The tax rate depends upon whether the production is primary or secondary production (70 percent), or incremental tertiary production (30 percent). The Windfall Profit Tax is deductible from both Federal and State taxable income in calculating the corporate income tax.

The Crude Oil Windfall Profit Tax Act of 1980 (PL 96-223, as amended) defines the taxable windfall profit as the excess, if any, of the wellhead price of the oil over a calculated "adjusted base price," reduced by the State severance tax on that profit. The adjusted base price for Sadlerochit oil is based upon its May 1979 price as determined under Department of Energy regulations at that time. The adjusted base price is the original base price, less \$0.21, adjusted for inflation. In 1984, the average adjusted base price for Sadlerochit oil was \$17.14 per barrel. (Note: For further discussion of the Windfall Profits Tax, see Section III(A) of this study.)

4. Taxation of Shipping

North Slope crude must be transported by ship to U.S. West and Gulf Coast consumers. Current tax law provides several incentives for investment in ships and shipping facilities.

Profits of qualified vessels -- if they are covered by certain agreements with the Secretary of Transportation -- may be sheltered from taxation by depositing them in a capital construction fund. To qualify, vessels must be documented in the United States and must have been built or rebuilt in the United States. In addition, depreciation on these vessels (generally five-year ACRS recovery allowances) may also be deposited in the fund. Earnings on all amounts in the fund are exempt from current Federal taxation.

Amounts withdrawn from the fund to acquire, build or rebuild eligible vessels -- or to repay principal on the debt incurred in such investments -- are not taxed immediately. However, the taxpayer's basis (amount which can be depreciated) in the acquired vessels is reduced to the extent that fund withdrawals represent profits paid in or income earned by the fund. This reduces the depreciation allowances on the new or rebuilt vessel, making more of the vessel's operating revenue subject to taxation. The taxpayer is also entitled to an ITC on at least one-half of its withdrawals for these purposes if the vessel is used in domestic trade.

In short, the deductions for amounts contributed to the Merchant Marine capital construction fund allow the taxpayer to defer if not avoid paying Federal income taxes on its qualified shipping income -- while possibly claiming ITCs -- as long as the contributions are used for further shipping activities.

5. Federal Expenditures

Apart from the special tax benefits available to shipping and oil production, Federal revenues are at risk under a number of non-tax Federal programs if ANS exports are allowed. About 70 tankers engaged in the Alaska oil trade were constructed under Title XI financial guarantees and represent contingent U.S. Government liabilities of \$1.9 billion. Any idling of these tankers would trigger government outlays on the guarantees, for unemployment compensation and for the cost of preserving the displaced, militarily-useful tankers that might be needed for the National Defense Reserve Fleet.

6. State Fiscal Considerations

The production and distribution of oil are also affected by taxation and other policies at the State level. Alaskan North Slope production is most directly affected by State of Alaska measures but is also influenced by some State of California measures. Each State collects royalties and severance taxes from crude oil production on State-owned land and each State levies business activity (income) and property taxes. The fiscal operations of both States are affected by the production and distribution of North Slope oil.

Energy-based revenues provide a substantial proportion of Alaskan State income. Severance tax collections, currently levied on non-royalty production at the rate of 15 percent of wellhead value, have grown at an average annual rate of 55 percent since 1975. Severance tax revenue represented nearly 75 percent of tax collections in 1984. Lease rents and royalties from oil and gas production contribute almost as much to State revenues as severance taxes. In addition, the property tax is now imposed only on oil and gas producers, and at least 75 percent of Alaskan corporate income tax receipts are derived from oil and gas production or transportation.

The existing prohibition on export of ANS crude influences California's fiscal position and economic development by depressing crude oil and petroleum product prices on the West Coast. ANS production that is not consumed in Alaska or on the West Coast is usually transported to the U.S. Gulf or East Coasts on U.S. flag vessels, at more than three times the transportation costs to the West Coast. Accordingly, North Slope producers have significant incentives to discount their excess crude on the West Coast and avoid the added transportation costs to the Gulf or East Coast. The surplus of crude on the West Coast tends to depress wellhead crude values and production in California, which reduces California royalty and tax collections.

The downward pressure on California production introduced by the Federal export prohibition is mitigated to some extent by low severance tax rates. The California severance tax is applied as a user charge with rates set each year to cover administrative costs associated with oversight of the State's oil and gas industry.

E. TRANSPORTATION AND TRADE PATTERNS

1. Introduction

When ANS oil was discovered in the 1960s, it was expected that West Coast markets would consume virtually all of its production. However, by the time the oil began to flow through the TAPS in 1977, West Coast markets could not absorb all the ANS crude production, which was much higher than originally anticipated. In addition, West Coast demand had not grown as rapidly as expected, and California oil production was greater than had been projected. These factors, combined with the export ban, made it necessary to transport some ANS crude through the Panama Canal to the Gulf Coast, East Coast, Puerto Rico, and the Virgin Islands.

With the exception of ANS shipments, U.S. maritime involvement with oil transportation has been in decline. Crude oil and petroleum product pipelines have increased their market share and changes in trade flows have eliminated some tanker markets. The Alaska shipping trade is now the primary source of employment for domestic tankers.

2. Legislation

ANS shipping patterns have been shaped by the export ban and by several other laws and Federal regulations. The following are brief summaries of relevant regulations and trade laws.

- o Jones Act - The Jones Act (Sec. 27 of the Merchant Marine Act, 1920) requires that all cargo transported in the domestic maritime trades be carried in vessels built in the United States, documented under U.S. law, owned by U.S. citizens, and crewed by U.S. seamen. This requirement holds whether the cargo moves directly between two U.S. ports or is transshipped via a foreign port or ports (e.g., pipeline shipments across Panama). An important exception to the Jones Act is that ocean shipments to and from the Virgin Islands may be on foreign-flag vessels.
- o The primary function of the Jones Act is to maintain a market for U.S. tankers. This is necessary because vessels that are U.S.-built and U.S.-operated have much higher capital and operating costs than foreign tankers. Even with capital and operating subsidies, U.S. tankers have had only limited success competing with foreign vessels. Without subsidies, U.S. tankers are simply unable to compete with foreign flag tankers.
- o Construction Differential Subsidy Program - Under the Merchant Marine Act of 1936, certain ships are eligible for a subsidy applied to up to 50 percent of the cost of their construction in U.S. shipyards. Tankers built with Construction

- o Differential Subsidy (CDS) assistance are also U.S.-built, U.S.-manned, and U.S.-owned. However, unlike the Jones Act, this subsidy applies only under the condition that affected ships are not eligible to operate in the domestic trades on a full-time basis. Soon after the TAPS opened, the demand was greater than the available supply of large Jones Act tankers to carry ANS crude oil from Valdez to Panama. As a result, large U.S. flag crude tankers built with CDS assistance were given permission to enter the ANS trade on a temporary basis, as the law permitted. Very Large Crude Carriers (VLCCs - tankers over 100,000 DWT) were permitted to operate in the domestic ANS trade for periods of up to six months per year under the condition that all Jones Act tankers over 100,000 DWT were fully employed. Since 1977, CDS-built tankers have been allowed to operate in the domestic trades on 42 different occasions.
- o While the use of CDS-built VLCCs has helped somewhat to alleviate the shortage of suitable tonnage, the six-month time restriction and the "100,000 DWT rule" have limited competition, necessitated the use of smaller vessels, and resulted in higher shipping costs than would have been the case otherwise.
- o Title XI of the Merchant Marine Act of 1936 - Title XI established the Ship Financing Guarantee Program, which provides loan guarantees on up to 75 percent of a vessel's financing, subject to Federal operating and financial conditions.
- o As of June 25, 1985, 70 tankers had about \$1.9 billion in Title XI guarantees or about 27 percent of the total \$6.9 billion Title XI exposure. Any changes that affect the fortunes of ships in the ANS trade can therefore also affect the Federal Government's loan commitments.
- o Port and Tanker Safety Act - The Port and Tanker Safety Act imposed more stringent environmental standards for crude oil and petroleum product tankers operating in U.S. waters. As a result, many tanker owners have decided that, given market conditions, it would not be worthwhile to incur the costs necessary to meet the new requirements for older, small tankers and so, from 1981 to 1984, 66 ships totaling 1.8 million DWT were scrapped.

3. Demand for Shipping Capacity

The factors that determine the demand for shipping capacity include: number of shipments, length of voyage, barrels per ton of cargo, and number of days in operation. For example, to ship crude from Valdez to Panama takes 32 days (round trip); there are 7.2 barrels per long ton; and the average vessel operates 345 days per year at 93 percent of capacity. Based on these factors, for every

100,000 B/D of ANS crude shipped to Panama, about 510,000 DWT of tanker capacity is required, roughly twice the capacity necessary for the Valdez to California route.

4. ANS Shipping Trades

Valdez to Gulf Coast/East Coast/Puerto Rico: This trade accounts for the largest part of ANS shipping, requiring about 700,000 DWT of capacity for each 100,000 B/D of traffic. Typically, the oil is transported from Valdez to a terminus of the Panama Pipeline in Jones Act vessels of 100,000 to over 200,000 DWT, or in one of the five CDS-built vessels of over 200,000 DWT. The pipeline transports the oil from the Pacific side to the Caribbean side where it is transferred to tankers of 90,000 DWT or less that carry it to its final destinations on the Gulf and East Coasts.

Valdez to West Coast (includes Hawaii and Alaska): Oil is generally carried to the West Coast in tankers of over 100,000 DWT except when volumes are small or the port has shallow draft restrictions. Intra-Alaska shipments are typically carried in tankers of under 50,000 DWT.

Valdez to Virgin Islands: The average volume of ANS shipments to the Virgin Islands is 100,000 B/D and, with few exceptions, it is transported around Cape Horn by foreign-flag tankers.

5. ANS Trade in Recent Years

Chart E-1 shows volumes and destinations of ANS shipments for the years 1981 to 1985. As ANS shipments increased from 1981 to 1982, tanker capacity in the trade also increased, reaching a high of 7.4 million tons in 1982. However, the opening of the Trans Panama Pipeline in October of that year reduced the tonnage needed by an estimated 560,000 DWT. Lower shipments to Panama in 1984 reduced needed capacity by another 600,000 DWT, and in 1985, the needed capacity fell to its present level of 6.1 million DWT, or 59 tankers.

U.S.-flag carriage now comprises the full-time equivalent of 18 tankers (2.9 million DWT) on the Valdez to Panama route (almost all over 100,000 DWT); the full time equivalent of 21 tankers (1.9 million DWT) for the trip from Valdez to the West Coast (mostly 55,000-90,000 DWT); and the full-time equivalent of 20 tankers (1.3 million DWT) that operate from Panama to Gulf and East Coast ports (mostly over 55,000 DWT).

6. California Oil Pipelines

A large projected increase in offshore California production plus continuing shipments of Alaskan North Slope crude oil will result in a daily surplus of several hundred thousand barrels of crude oil on the West Coast. In order to move this oil surplus from California

and Alaska to Gulf Coast refineries, two interstate pipelines have been proposed -- one of which is under construction.

The All American Pipeline is scheduled to start moving heavy crude through its 30-inch system during the first quarter of 1987. The other proposed pipeline is the Pacific Texas Pipeline Company which plans to begin construction in early 1987 with completion scheduled for mid-1987.

Some industry sources project that sufficient surplus California offshore oil will not be available until the early 1990s to fill the 300,000 B/D capacity of the All American Pipeline. There is also some doubt that the much larger 900,000 B/D Texas-Pacific pipeline to carry both Alaskan and offshore California crude oil will ever be built.

There have been recent activities in California and Texas that have some long range impacts on California interstate oil pipelines. One -- a November referendum to restrict hydrocarbon development offshore Santa Barbara -- was defeated by the voters resulting in a victory for energy producers. The other activity concerns the extension of the All American Pipeline to Houston from McCamey, Texas, and has not been resolved as yet.

7. The All American Pipeline

The All American Pipeline Company (AAPL) is a unit of Celeron Corporation which is a subsidiary of the Goodyear Tire and Rubber Company. Projected costs of the nearly 1,800-mile and 30-inch heated pipeline is about \$1.5 billion. Construction costs are estimated at \$885 million and capitalized interest and overhead compose the remaining \$615 million. Financing for the pipeline was completed in late October when 14 international and domestic banks agreed to provide more than \$700 million of term loans.

The AAPL will move crude oil from a point near Santa Barbara, California to Webster, Texas on the Gulf of Mexico. The pipeline is more than twice the length of the Trans-Alaska Pipeline. It is scheduled for completion in the first quarter of 1987. There will be 21 pump/heat stations along the route to ensure the flow of the heavy crude that will take about 18 days to reach the Texas refineries. The tariff is expected to be about \$1 a barrel less than shipping the crude oil from California to the Gulf Coast via the Panama Canal or the Trans-Panamanian Pipeline.

Construction efforts are currently underway on four sections of the All American Pipeline. Over 646 miles of pipeline had been installed as of mid-January 1986. Pipe is being laid at the rate of 5 miles per day from waiting stockpiles. Installation of pumping stations was scheduled to begin in February 1986.

There has been a delay in the pipeline's acquisition of an operating permit from McCamey to Webster in Texas. At issue is a 6.6 mile stretch of pipeline south of Austin that would cross the Edwards Aquifer, the area's major source of fresh water. A lawsuit has been filed by a group of landowners against the Texas Railroad Commission to halt Commission hearings on granting an operating permit through the Aquifer. The opponents feel that there is a threat of leaks which could pollute the natural underground water system.

If the court upholds the lawsuit, then the Railroad Commission must promulgate new safety regulations for the pipeline that could take months. If the court rules against the landowners, the Railroad Commission could approve the operating permit later this year. The Aquifer is already crossed by 28 crude oil, gas and product pipelines and the company anticipates that an operating permit will be granted in the Spring. The company has obtained over 1,400 miles (82 percent) of the 1,750 miles of private-right-of-way, Federal, State, and County easements that will be needed for the project.

Although the All American Pipeline has no throughput commitments as yet, it is likely that it will use the pipeline to ship its own supplies of crude oil. In 1982, Celeron acquired interest in 24 leases in the Santa Barbara Channel and the Santa Maria Basin off southern California. In one of these leases, Celeron owns a 27 percent stake in a 70-well offshore drilling platform called Julius that is designed to produce 40,000 B/D and is scheduled to start production in early 1987. In late January 1986, a 3,700 B/D discovery was found in the Point Sal area of the Santa Maria Basin in which Celeron has a 10 percent interest.

Along with these offshore finds, Celeron has also recently purchased heavy crude oil properties in Kern County, California. The two properties are the Formax holding of 198 acres in Kern County with 106 production wells on the land and the Chevron Hill Property which covers 502 acres of the South Belridge Field and has 130 production wells. The company plans to drill new wells on the properties and, with steam injection methods, they expect to increase production substantially in both areas. In addition, Celeron has been meeting with a large number of producers of offshore California crude and Gulf Coast refiners to report on the progress of the pipeline and to obtain information on the transportation needs of these groups.

One remaining crucial factor is whether the interstate pipelines would be profitable in light of the recent sharp drop of oil prices below \$20 a barrel. The company spokesmen from the All American Pipeline recently indicated that the pipeline needs to move about 100,000 B/D to break even. If oil prices settle at about the \$20 level, there would be no problem; however, if heavy crude prices remain at or below the \$15 level, there would be some concern about the profitability of the pipeline.

8. The Pacific Texas Pipeline Company

The second California interstate pipeline will carry crude oil from a Long Beach tanker terminal to Midland, Texas. The route for the 1,026 mile pipeline is similar to that of the All American Pipeline Company, but they are not in direct competition. This pipeline will not be heated and will carry lighter crude oil from Alaska as well as heavy crude oil from offshore Santa Barbara. The project is planned for a capacity of 900,000 B/D and is expected to be in operation by late-1987. It is estimated that companies will save about \$2 a barrel by using the pipeline rather than shipping oil through the Panama Canal or the Panama pipeline.

The plans for this pipeline are still in the engineering, design, and environmental permit stage. During June 1985, the project was given a vote of confidence when the Los Angeles Harbor Improvement Corporation (LAHIC) approved a resolution for a \$430 million issue of tax-exempt bonds. These bonds will help finance the port facilities for the California-to-Texas pipeline. This means that after the pipeline project has obtained the required permits and agreements, it will be able to fund a major part of the \$1.6 billion cost for the pipeline with low-cost financing. The \$430 million will be used at Los Angeles for the pipeline's receiving terminal and related facilities. Construction on the pipeline is expected to begin in 1986 and will take 16 to 18 months.

There are a number of reasons to question whether the Pacific Texas Pipeline will be built. Financing has not been completed as yet and although pipe purchases have been made, much of the pipeline is still in the planning stage. Although construction of the pipeline is expected to begin in 1986, it is obvious that the projected oil surpluses cannot support two pipelines before 1990. The longer that this group delays moving forward on the project, the more likely that it will be built later, if at all.

9. Recent Changes in the Trade

As recently as 1981, it cost \$5.00 to \$5.50 to transport a barrel of oil from Valdez to the Gulf Coast and about \$1.40 per barrel to ship ANS crude oil to West Coast ports. Since then there have been major changes in the trade.

With the opening of the Panama Pipeline, the transfer of oil from the Pacific to the Caribbean has become more efficient, accounting for an estimated decline of 500,000-600,000 DWT in the amount of capacity needed. There has also been considerable scrapping of old tankers since 1981: over 3 million DWT in tanker capacity was scrapped in 1983 and 1984. Moreover, there has been the introduction of new tonnage into the trade. Four tankers in the

70,000-140,000 DWT range were rebuilt and reflagged under the provisions of the Wrecked Vessels Act since 1981, and Exxon decided to build two 209,000 DWT tankers that will enter the fleet in 1986 and 1987.

Finally, on May 3, 1985, the Department of Transportation decided to allow a one-year opportunity for owners of tankers built with CDS subsidies to repay the unamortized balance on the subsidies (plus interest) in return for the right to operate full-time in the domestic trades. Owners of two ships have taken advantage of the offer, which has added 530,000 DWT to the ANS trade.

As a result of these changes, there has been almost continual decline in ANS shipping rates. We estimate that by 1985, the average cost to ship ANS crude to the Gulf Coast was about \$4.00 per barrel, \$1.00 to \$1.50 less than it was in 1981, and that it cost about \$1.15 to ship oil from Alaska to the West Coast, down from \$1.50 in 1981.

10. Proprietary Tonnage

Approximately 40 percent of domestic tanker tonnage in the Alaska trade is owned by oil companies; the remainder is chartered (see Appendix B for explanation of types of charters). Among the oil companies, there is a wide variance in the amount of proprietary tonnage versus chartered tonnage. Sohio, for example, must charter its entire tanker requirements because it is controlled by a foreign company (British Petroleum), which cannot own U.S.-flag tonnage.

Exxon owns about 30 percent of its fleet, for all its operations, and charters the rest. In 1985 for the ANS trade, it had five tankers operating in the Pacific and seven tankers operating east of Panama.

For all its operations, Arco owns 70 percent of its fleet and charters the remainder. For the Alaska trade in 1985, it had eight tankers operating in the ANS trades, all in the Pacific. On July 26, 1985, Arco repaid its unamortized CDS (plus interest) on two 265,000 DWT VLCCs, which will be deployed in the Valdez to Panama trade.

Chevron used seven different tankers in the ANS trades during 1985, most making only a few trips during the first eight months of the year. Finally, three other oil companies recently operated tankers in the ANS trade for at least some period of time: Mobil (3), Sun Oil (3), and Texaco (2).

11. Militarily Useful Tankers

Although all tankers available to the country might be used in a military emergency, certain vessels are particularly useful -- the tankers under 100,000 DWT that can carry refined products (not just

crude oil, which has no direct value in military operations) and can serve most port areas without special offshore loading or unloading arrangements.

The Alaska trade is particularly important for maintaining the active use of these tankers. During 1985, out of 81 tankers that participated in the ANS trade for any period of time, 57 tankers totaling 3.4 million DWT were militarily useful; all but seven of these were capable of transiting the Panama Canal.

TABLE E-1
HISTORICAL TRADE FLOWS
FOR AHS CRUDE
(Thousand B/D)

<u>Year</u>	<u>West Coast</u>	<u>Gulf/East Coast</u>	<u>Virgin Islands</u>	<u>Total</u>
1978	681	347	27	1,055
1979	878	310	81	1,269
1980	956	472	106	1,534
1981	868	542	126	1,536
1982	817	701	100	1,618
1983	836	712	106	1,654
1984	969	569	118	1,656
1985*	1,000	630	128	1,758

West Coast statistics include shipments to Alaska and Hawaii
 Gulf/East Coast statistics include shipments to Puerto Rico.

* Statistics from January - August

F. FOREIGN POLICY

The oil shocks of 1973-74 and 1979-80 clearly demonstrated how global the oil market has become. When oil supplies were disrupted and output reduced, prices rose dramatically, even in countries that do not import oil, as buyers scrambled to outbid each other for the available oil. Thus, in the future, the United States will be affected by price rises in the global oil market, even if supplies to the U.S. are not disrupted. The Pacific Rim oil importing countries were (and still are) particularly vulnerable to oil supply disruptions and in past disruptions greatly contributed to bidding up global oil prices. The security of U.S. oil supply therefore depends not only on the physical possession of crude oil, but also on our ability to obtain it at a reasonable price. Energy security requires that we take measures to mitigate the price increase due to a supply disruption and thus lessen the damage to the U.S. economy.

Foremost among the measures to protect the U.S. from oil price rises in an oil supply disruption is the Strategic Petroleum Reserve. It now contains about 490 million barrels of oil, or over 100 days of net imports of crude oil. In addition, the U.S. has sought to persuade its IEA partners to increase the level of their oil reserves for use in an emergency. The existence of substantial oil stockpiles around the world creates a buffer that would dampen the tendency for a global oil supply disruption to result in sharp price rises.

The Administration has also moved toward a more open trading system that would allow market forces to determine oil prices and distribution. In the International Energy Agency, the U.S. has led the formation of a consensus that reliance on market forces is an effective means to promote stability and energy security. The U.S. has encouraged the United Kingdom and Norway to rely on the free market in determining oil prices and quantities, and to resist efforts by OPEC to control the market.

To aid the development of a free global energy market which would enhance U.S. energy security, recent steps have been taken by the Administration to relax U.S. crude oil export restrictions on non-Alaskan North Slope oil. Pursuant to the agreement reached at the Quebec Summit in March 1985, the President made national interest findings under the Energy Policy and Conservation Act, the Mineral Lands Leasing Act and the Outer Continental Shelf Lands Act to permit the export of crude oil to Canada. Likewise, Canada liberalized its crude oil trade with the United States. The President, on the recommendation of his Economic Policy Council, announced his decision to lift controls on Alaskan Cook Inlet oil in October 1985. The Secretary of Commerce found that allowing exports of crude oil from Alaska's Cook Inlet is in the national interest and consistent with the purposes of the Energy Policy and Conservation Act. The production on Cook Inlet is small, about

47,000 B/D in 1985. Only about 4-5 MB/D is anticipated to be available for export to the Pacific Rim countries. This action allows for, but does not require, the export of crude to the Pacific Rim. The message is positive and encourages reciprocal market opening moves across the board.

G. ENERGY SECURITY

In discussing energy security, it is useful to distinguish between oil supply vulnerability and oil import dependence. Our exposure to higher oil costs is not limited to the level of our imports, so long as trade is unrestricted. Our energy security depends more on how high oil prices may rise during a disruption rather than on the level of our oil import dependence. The difference is important because while we all may agree that improving energy security is a worthy objective, we may differ considerably in terms of how to achieve that objective.

Even if the United States imported no oil, price increases caused by supply disruptions would impose large costs on our economy. Certain sectors (e.g., agriculture, chemicals, petrochemicals, and the automobile industry) would suffer unemployment and idle resources due to large oil price increases. In addition, the effect of a disruption on our import dependent trading partners would be transmitted back to our economy in the form of reduced demand for some U.S. exports and higher prices for goods imported by the United States.

The most effective energy security policy is to maintain an adequate strategic oil stockpile (as the United States does) and to urge other oil consuming countries to increase their stockpiles to reasonable levels and to encourage them to develop flexible response measures for use in the event of an oil supply disruption. Such flexible policies would include a market response to changing oil prices.

In the event of an oil supply disruption, restrictions on the export of domestic oil will not reduce the impact on the United States. Domestic oil consumption would fall and the economy would suffer losses even if Alaskan oil were retained for domestic use. Restrictions on Alaskan oil exports would result in less imports coming into this country than would otherwise be the case, but such restrictions cannot insulate the United States from price increases in the world oil market. As noted previously, past oil supply disruptions have already demonstrated the highly integrated nature of the world oil market.

The disruption experiences of 1973, 1979, and 1980 showed that the critical factors in mitigating supply shortages--and thus enhancing energy security--are the adequacy of stockpiles and excess production capacity.

At the time of the 1973 and 1978 disruptions, world oil demand had almost reached total oil production capacity. The price increases that resulted from those disruptions were partially responsible for the worldwide recession from which we are now recovering. In

addition, the price increases encouraged significant conservation and energy efficiency improvements. Both results led to reduced world oil demand and current spare production capacity estimated at about 10 million barrels of oil per day. As international economic recovery continues and energy demands by developing countries increase, this spare production capacity will diminish, but world demand is not expected to press again against total production capacity until the 1990s. Thus, in terms of the critical factors affecting energy security, the United States and its allies are significantly better off than in the recent past.

Note: One example of the benefits of stockpiling: it is estimated that a stock release of 25-30 million tons "would have been sufficient to replace the entire physical shortfall during the first three months of the 1979 and 1980 supply disruptions". [IEA statement, 1984]

H. EMPLOYMENT

Lifting the ban on exports of Alaskan North Slope (ANS) crude oil would have employment effects. This section surveys historical trends in employment for the economic sectors that would be principally affected.

The following average annual employment data were provided by the Alaska Department of Labor for Alaskan industries that are directly involved in the production of oil and refined products:

TABLE H-1

TOTAL EMPLOYMENT IN ALASKA
(number of workers)

Year	<u>Oil and Gas Extraction (SIC 13)</u>			<u>Oil Refining</u>
	<u>State</u>	<u>Anchorage Area</u>	<u>Northern Labor Market Area</u>	<u>(SIC 291)</u>
1974	2,608	1,279	383	50
1975	3,440	1,249	1,166	61
1976	3,644	1,344	1,264	70
1977	4,347	1,492	1,961	93
1978	5,138	1,825	2,384	146
1979	5,382	1,868	2,612	146
1980	6,159	2,522	2,779	177
1981	8,177	3,130	3,872	190
1982	8,085	3,525	3,574	167
1983	7,444	3,733	3,330	187
1984	8,045	3,422	3,612	202
1985E	8,789	4,149	3,875	220

Note: 1985 data are based on the first six months of the year.

Source: ES-202 employment counts provided by the Alaska Department of Labor.

Oil and gas extraction (Standard Industrial Classification (SIC) 13) measures employment in crude oil production. Although most of this employment is in the Alaskan North Slope (ANS) area, the Alaskan Department of Labor estimates that nearly all SIC 13 employment in the Anchorage area is related in some way to ANS crude oil production. State employment figures show that over 98 percent of the employment growth in Alaskan oil and gas extraction over the 1974-1984 period has occurred in the Anchorage and Northern labor market areas. In 1984, Alaskan private sector employment was 158,077, five percent of which were employed in crude oil production.

Employment in oil refining (SIC 291) and pipelines (SIC 46, which excludes natural gas) is directly affected by ANS crude oil production. Four refineries are currently operating in Alaska, but only one of these, the Mapco Refinery at North Pole, uses ANS crude oil. Capacity at Mapco is 46,500 B/D, a third of Alaskan refinery capacity but only 2.6 percent of estimated 1985 crude oil production. Alaskan refinery employment is estimated to be 2.5 percent of oil and gas production employment (SIC 13) for 1985.

Workers stationed along the Trans-Alaska Pipeline (TAPS) are included in the State employment estimates for pipelines (SIC 46). Alaskan employment in pipelines is less than 15 percent of overall oil and gas production employment, based on 1985 estimates. Since the TAPS is in place, workers currently employed on pipelines are primarily involved with maintenance.

Although it is likely that there are significant indirect employment effects within the Alaskan economy caused by oil production, they cannot be measured with accuracy. There is, for example, a wide variety of service industries in the North Slope area which depend mainly on spending by the oil industry and its employees. The same is true for the Anchorage area, which serves as a base for oil company staff support facilities and where many oil workers either reside or visit frequently in between their one or two week work shifts on the North Slope.

In addition, significant increases in State and government employment may have resulted from increased revenues derived from State and local taxes on oil production. According to the Alaska Department of Labor, petroleum revenue to the State increased from \$477.6 million in fiscal year 1977 (or 55 percent of the State's general fund) to \$2,861.6 million in fiscal year 1984 (or 84 percent of the State's general fund). Over this same period, State government employment increased from 14,376 in 1977 to 19,860 in 1984. Also, local government employment increased from 19,083 in 1977 to 28,400 in 1984.

Employment in construction also increased as added State and local government revenues were used to finance construction projects and to provide mortgages to first-time homeowners at lower-than-market interest rates.

Under current export restrictions, all ANS crude oil not processed by Alaskan refineries must be shipped to other markets in the United States. Due to the Jones Act and other statutory requirements, all U.S. tankers carrying ANS oil to U.S. ports must be U.S.-owned and operated, and must have American crews. However, direct shipments of ANS oil to the Virgin Islands are exempt from the Jones Act.

Maritime employment on the so-called Jones Act tankers is shown in Table H-2. These data show the number of tankers, the average number of seafarers per tanker, and the number of seafarers on U.S. flag tankers actually engaged in shipping ANS oil in January of each year. Seafaring employment and the number of tankers increased in the 1980-1982 period and declined thereafter. Also, there is some indication that the average number of seafarers per tanker has declined over the 1981-1985 period, although this is not true for all routes.

The size of the Jones Act tanker fleet employed in the ANS trade measured in deadweight tons (DWT), number of tankers, and average tanker size on each trade route are shown in Table H-3. Shipments from Panama to Gulf and East Coasts and Puerto Rico are made on relatively small tankers, while shipments from Valdez to Panama are made on large tankers. There is no apparent trend in average tanker size over time.

TABLE H-2

NUMBER OF SEAFARERS
AND NUMBER OF JONES ACT TANKERS
(January of Each Year)

	<u>Valdez to</u> <u>West Coast</u>	<u>Valdez to</u> <u>Panama</u>	<u>From</u> <u>Panama (a)</u>	<u>Total</u>
1980				
Seafarers	1,394	681	1,806	4,025 (c)
Tankers	22	11	23	58 (c)
Ratio (b)	63	62	79	69 (c)
1981				
Seafarers	1,431	708	2,062	4,306 (c)
Tankers	22	11	27	61 (c)
Ratio (b)	65	64	76	71 (c)
1982				
Seafarers	1,293	1,237	3,117	5,647
Tankers	19	20	41	80
Ratio (b)	68	62	76	71
1983				
Seafarers	1,267	1,272	2,362	4,901
Tankers	20	19	33	72
Ratio (b)	63	67	72	68
1984				
Seafarers	1,635	1,090	1,513	4,239
Tankers	27	17	22	66
Ratio (b)	61	64	69	64
1985				
Seafarers	1,523	959	1,385	3,866
Tankers	26	15	21	62
Ratio (b)	59	64	66	62

Notes:

- (a) Shipments from Panama include shipments bound for the Gulf and East Coasts and Puerto Rico.
- (b) Ratio refers to the average number of seafarers per tanker.
- (c) Totals include shipments from Panama to the Virgin Islands on U.S. flag tankers.

Source: U.S. Maritime Administration.

TABLE H-3

SIZE OF JONES ACT TANKER FLEET (IN DWT)
AND NUMBER OF JONES ACT TANKERS
(January of Each Year)

	<u>Valdez to</u> <u>West Coast</u>	<u>Valdez to</u> <u>Panama</u>	<u>From</u> <u>Panama (a)</u>	<u>Total</u>
1980				
Size	2,343,100	2,122,500	1,192,300	5,791,900 (c)
Number	22	11	23	58 (c)
Ratio (b)	106,505	192,955	51,839	99,860 (c)
1981				
Size	2,436,600	2,148,400	1,393,500	6,027,800 (c)
Number	22	11	27	61 (c)
Ratio (b)	110,755	195,309	51,611	98,816 (c)
1982				
Size	1,841,900	2,954,300	1,817,000	6,613,200
Number	19	20	41	80
Ratio (b)	96,942	147,715	44,317	82,665
1983				
Size	1,785,700	3,273,500	1,762,200	6,821,400
Number	20	19	33	72
Ratio (b)	89,285	172,289	53,400	94,742
1984				
Size	2,144,000	2,603,900	1,316,000	6,063,900
Number	27	17	22	66
Ratio (b)	79,407	153,171	59,818	91,877
1985				
Size	2,220,100	2,433,200	1,315,300	5,968,600
Number	26	15	21	62
Ratio (b)	85,388	162,213	62,633	96,268

Notes:

- (a) Shipments from Panama include shipments bound for the Gulf and East Coasts and Puerto Rico.
- (b) Ratio refers to average tanker size as measured by the ratio of deadweight tonnage (DWT) to the number of tankers.
- (c) Totals include shipments from Panama to the Virgin Islands on U.S. flag tankers.

Seafaring employment is measured in terms of billets, which are positions or work stations. The U.S. Maritime Administration estimates that 2.3 seafarers are needed for each billet to cover different shifts and to allow for vacation and sick leave. There is no clear relationship between the number of seafarers per ship or per deadweight ton (DWT). Furthermore, the data in Table H-4 show that seafaring employment is about the same for different tanker sizes.

TABLE H-4
RELATIONSHIP BETWEEN CREW SIZE
AND TANKER SIZE FOR JONES ACT TANKERS
EMPLOYED IN THE AFS TRADE

<u>Trade Route</u>	<u>Tanker Size</u>	<u>Crew Size (number of billets)</u>	
		<u>Range</u>	<u>Average</u>
Valdez to:			
West Coast and Panama	less than 55,000 DWT	17-32	24
	55,000-90,000 DWT	21-32	28
	110,000-140,000 DWT	23-32	28
	170,000-190,000 DWT	22-31	28
Panama	over 200,000 DWT	28-29	29
Panama to:			
Gulf and East Coasts	less than 55,000 DWT	17-33	25
	55,000-90,000 DWT	21-36	28

Source: U.S. Maritime Administration

III. EFFECTS OF CHANGES IN INCENTIVES FOR ANS PRODUCTION

INTRODUCTION

Section 126 requires that this study address "the issues and related data concerning possible changes in the existing incentives to produce crude oil from the North Slope of Alaska, including changes in Federal and State taxation, pipeline tariffs, and Federal leasing policies...." A wide variety of options exist that would increase the incentives to produce ANS oil, ranging from decreasing taxes on oil producers to providing direct subsidies for production. Any change that directly or indirectly raises the profitability of oil production on the Alaskan North Slope would potentially stimulate increased oil production during the time period being studied (1987-2000). Specific policy options were selected for analysis to serve as examples for each of the three categories referred to in Section 126. The policy options demonstrate the types of impacts which could occur in response to changes in the incentives to produce oil from the Alaskan North Slope. Inclusion of a policy option for analysis does not in any way imply an endorsement for that option, nor does exclusion of an option imply disapproval.

ASSUMPTIONS

The discussion of taxation, tariffs and leasing would be premature without first mentioning the assumptions underlying the analysis.

The following discussion briefly addresses the oil price, industry investment and price elasticity elements of Section III analysis; a more thorough treatment of each issue can be found in the technical appendices. The basic assumptions are:

Oil Prices - The analysis draws upon the midpoint of the U.S. average refiner acquisition cost and the related Valdez FOB price. In this case, the 1985 U.S. Imported Refiner Acquisition Cost (IRAC) and Valdez prices are \$27 and \$23 per barrel, respectively.

- The midpoints 1987 prices are projected to drop to \$24, and \$20 respectively by 1990.

Industry Investment - The analysis assumes that companies will increase investment in anticipation of higher profits yielded by the increased incentives. The industry investment occurs on a short-and long-term basis:

- Short-term - Increased incentives will increase the investment in production from proved reserves. This can entail using enhanced recovery techniques or waiting longer before shutting in a well. Once a well is shut in, it cannot be reopened. Therefore, the increase in production from these short-term investments represents a permanent addition to total oil production.
- Long-term - The anticipation of higher future profits from production will stimulate increased exploration activity and earlier development of new fields. Due to the long lag time between discovery and production, the increase in production caused by this type of investment does not occur until 15 years or more after investment. This increase in production does not constitute a permanent increase in total production; rather development and production are shifted forward in time.
- The proceeds from incentives that result in higher wellhead prices will be invested in a manner consistent with the preceding discussion and based upon private companies' perceptions of oil price movements and attractive acreage to explore. However, increased current cash-flow is not a requirement for increased current investment.

Supply Elasticity - This represents a common method of quantifying an oil production response resulting from an increase in a wellhead price. In as much as price effects are cumulative and there is at least a 10-15 year lag between exploration and marketed Alaskan production, the price elasticity of supply will not reach its full value until after 15 years from the initial (1987) price change.

A. POLICY OPTIONS AND ESTIMATES OF RESULTING CHANGES IN NETBACK PRICE

POLICY OPTIONS ANALYZED

Taxation

The policy option examined regarding possible changes in Federal taxation relates to an exemption of ANS crude from the Federal Windfall Profit Tax (WPT). Oil produced from the Sadlerochit and West Sak Reservoirs at Prudhoe Bay, with the exception of Alaska state royalty oil, is subject to the Windfall Profit Tax. It would be possible to make changes in WPT that only affect the Alaskan North Slope. The policy option considered is an exemption of all ANS oil from the WPT.

Turning to State taxation, the most significant and most obvious tax is the State Severance Tax. Policy options considered are a 25 percent and a 50 percent reduction in the severance tax rate.

Tariffs

The tariffs charged for transporting oil through the Trans-Alaskan Pipeline System (TAPS) have been the subject of extended litigation. A settlement was reached in late October, 1985 between the U.S. Department of Justice, the State of Alaska, and six of the eight pipeline owners. Under the settlement, pipeline tariffs will be calculated according to an agreed-upon formula and will depend on the amount of oil flowing through TAPS. Adoption of the settlement tariffs is not a policy option per se, since it is, for the most part, a fait accompli. However, the impacts of the settlement are of interest. Therefore, this study evaluates the change in tariffs from what they would have been in the absence of the settlement to what they will be under the settlement as if it were a policy option.

Leasing

Two important issues were identified in the category of Federal leasing policies: lease availability and royalty rates. Changes in the availability of acreage for lease do not impact on the incentives to produce oil, but they can restrict the ability to do so. No specific policy options were identified regarding lease availability because current policies have not and are not expected to restrict activity.

With regard to royalty rates, there is a Federal statutory minimum royalty rate of 12.5 percent for Federal leases. Reducing this rate would increase the incentives to produce oil. Policy options considered were a 25 percent and a 50 percent reduction in the royalty rate for all current and future Federal leases.

Change in Wellhead Price

It is most common and familiar to discuss the incentives to produce oil in terms of the wellhead price. A higher wellhead price provides oil producing companies with an economic incentive to produce more oil. However, of the policy options analyzed, only changing the TAPS tariffs would directly impact wellhead price. The other policy options analyzed affect the return to the producer without affecting the wellhead price. (For the purposes of this study, "return to the producer" was defined as the wellhead price minus royalty payments, severance taxes, and windfall profits tax payments.) In the appendix, the "equivalent wellhead price" is calculated for each policy option analyzed. The equivalent wellhead price is defined as the wellhead price that results in the same return to the producer as does the policy option. Table III-1 shows the original wellhead price and the equivalent wellhead price for each policy option identified.

1. Federal and State Taxation

Windfall Profit Tax - The Windfall Profit Tax only applies to ANS production from Prudhoe Bay (the Sadlerochit and West Sak Fields), and is scheduled to be phased out by 1994. Assuming mid-point oil prices, the wellhead price falls below the \$17.85 per barrel threshold price from which the WPT is calculated between 1987 and 1990. Only if oil prices turn out to be near the high end of the projected range would any ANS production be subject to the WPT.

The recent declines in oil prices make it unlikely that the wellhead price will rise above the WPT threshold base price. (Note: The ANS wellhead price in March 1986 is estimated at \$8.43-9.17 per barrel - see Table VI-1.) However, if prices rise, then exempting Sadlerochit and West Sak oil from the WPT would increase the incentives to produce oil from these two fields. Assuming high future oil prices, exemption from the WPT would increase return to the producer by an amount equivalent to a 9.1-21.8 percent increase in wellhead price. In short, this means an increase in the 1987 and 1990 wellhead prices from \$18.58 and \$19.68 to \$20.28 and \$23.98, respectively (see Appendix C, Table 7).

State Severance Tax Rate - Most ANS oil is taxed by the State of Alaska at a rate of 15 percent. Table 6a in Appendix C shows that reducing the rate by 25 percent to 11.25 percent would increase the return to the producer by an amount equivalent to a 4.4 percent increase in wellhead price. Reducing the severance tax rate by half to 7.5 percent (see Table 6b) would be equivalent to an 8.8-13.1 percent increase in wellhead price -- i.e., from \$16.09 and \$16.66 per barrel in 1987 and 1990 to \$17.50 and \$18.85 per barrel, respectively.

2. Pipeline Tariffs

TAPS Settlement -- Tariffs under the settlement will be lower than the current tariffs, increasing the return to the producer. Reducing the tariffs according to the settlement directly increases wellhead price by 11.4-29.9 percent. Much of the oil produced from the North Slope is produced by companies that are part owners of the pipeline. For these companies, reduction of the tariff means an increase in profits from producing and a decrease in pipeline profits. Therefore, for these companies, the increase in profits per barrel of oil produced caused by reducing the tariffs will be less than calculated here.

3. Federal Leasing Policies

Lease Availability - OCS lease sales are scheduled to be held every three years for the Beaufort Sea and Chukchi Sea Planning Areas. The first step in determining which areas are to be offered for sale is nomination of the most promising areas by interested firms. Until 1982, a value estimate and an Environmental Impact Statement (EIS) were completed for each tract offered prior to the sale. The

need for a value estimate and an impact analysis for each tract constrained the number of tracts which could be offered in a sale and less than half of the tracts nominated were offered.

Under area-wide leasing, which began in 1982, value estimates are done after the sale is held and the EIS is done on an area-wide basis, instead of tract-by-tract, allowing the acreage offered to be increased substantially. In 1984 and again in 1985, the area-wide leasing process was modified to allow earlier consultation and to resolve conflicts by deleting from the sale low-potential areas which are identified as environmentally sensitive or for which other conflicts arise. The result is a process which focuses on promising acreage but still provides flexibility to respond to changing conditions. If, due to new information or increases in wellhead price, an oil producer decides that an area has economic potential, and that area is not environmentally sensitive or unleaseable for other reasons, it will be offered for lease within three years. It is unlikely that holding lease sales more frequently than every three years would result in acreage being leased sooner or in more wells being drilled. Further, it would not be possible to include more acreage in each sale than is currently offered because acreage deletions are done in response to legitimate environmental concerns.

Onshore Federal lands on the North Slope include the Naval Petroleum Reserve - Alaska (NPRA) and the Arctic National Wildlife Refuge (ANWR). Lease sales have been held for NPRA, but early results have been disappointing and industry interest in this area has decreased. A lease sale in 1984 in NPRA received no bids, and a decision was made not to hold a sale in 1985. Future sales will be held if and when more interest is shown in bidding on NPRA leases. In contrast, there is considerable industry interest in exploring ANWR. However, Congressional action would be required to allow exploration and development of ANWR. The Department of the Interior is currently conducting a study of the resource potential of ANWR, to be submitted to Congress as required by section 1002 of the Alaska National Interest Lands Act of 1980. However, if Congress does allow exploration and drilling in ANWR, the long lead time for development in this area would mean that any production from ANWR would not begin until after 2000.

The recent decline in world oil prices may serve to discourage firms from undertaking new wildcat drilling. Companies will drill where geological structures are promising and sizeable financial returns are expected. Reduction of Alaskan wellhead prices resulting from lower world oil prices may lessen companies' interest in remote, marginal fields. Therefore, the issue will not be solely confined to the volume of acreage available but will encompass the selection of acreage, the taxation regime and future level of oil prices.

Royalty Rates - Significant production from Federal leases is not expected to occur before 2000. However, Table 5a (See Appendix C) shows that reducing the royalty rate on existing and new leases by 25 percent would increase the return to the producer on any oil from Federal leases by an amount equivalent to a 3.6 percent increase in wellhead price. Reducing the rate by 50 percent (see Table 5b) would be equivalent to a 7.1-7.5 percent increase in wellhead price.

B. IMPACTS

The policy options identified in Section III-A involve major changes in the incentives to produce oil. However, as the analysis in this section shows, the long-run impacts of these changes would generally be small.

1. Production Impacts

Increasing the incentives to produce oil from the North Slope will result in more oil being produced during the time period being studied (1987-2000). The projected increase in crude oil production includes both (1) permanent oil supply increases due to price effects; and (2) shifts in the timing of production increasing near-term oil production at the expense of later production. The permanent oil supply increase comes primarily from old oil fields where increasing the wellhead price increases the economic life of existing wells.

Generally speaking, higher prices mean that old wells can be operated longer, thus increasing the ultimate oil recovery from a given well. Once a well is no longer economical to operate and is closed down, it essentially cannot be reopened for production if prices later increase.

Between 1987 and 2000, the increase in production which would occur comes mostly from this increase in recovery from existing wells. Increasing the incentives to produce also has the effect of making some fields economic to develop at an earlier time. Because of the long lag times involved, these wells would not begin producing until around 2000. By shifting forward in time the development of fields which would have been developed later, production in the early years of the next century is increased. As the production from these new wells begins to decline, production falls below what it would have been without the increased incentives.

The size of the near-term supply responses from implementation of the policy options described in Section III-A is difficult to predict (See Appendix C for the methodology used). Table III-2 presents three estimates of the production responses based on

different assumptions. The "medium" estimates can be interpreted as the most likely supply response and only medium estimates are used in the discussion of other impacts.

Exemption of North Slope production from the Windfall Profit Tax would have no impact on total production at mid-range prices because the wellhead price is projected to stay below the base-price until 1995, by which time the WPT will have been phased out. Even if high prices are expected, the production response will be small (0 - 10,400 B/D), due in part to the fact that the WPT only applies to a portion of the total North Slope production.

Reduction of the royalty rate will not cause a significant increase in production during the time period studied. There is no production from Federal leases on the North Slope currently, and there is not expected to be any significant production before the year 2000. Because little production is expected from existing Federal fields, any production response from changing the Federal royalty rate could only come from increased exploration and development. However, the long lag time in developing North Slope fields means that such an increase in exploration would not impact production during the next 15 years.

Adoption of the TAPS Settlement would have the biggest impact of the policy options analyzed causing a possible increase in production of 37,000 - 114,000 B/D in 2000. However, as discussed in Section III-A, the fact that some of the producers are also part owners of the pipeline means that the estimates presented in Table III-2 for the TAPS settlement may be high.

Reduction of the State severance tax rate would have less of an impact on production than the TAPS settlement. Even reducing the rate by half would only increase production by 6,100 - 18,400 B/D in the year 2000.

2. Federal and State Revenue Impacts

None of the policy options analyzed would affect government outlays. Estimates of the impact on Federal income tax and Windfall Profit Tax and State of Alaska income tax, severance tax, and royalty revenues were calculated (see Table III-3) for each of the policy options identified in Section III-A. Impacts on bonus bid revenues would be small relative to other revenue impacts and were not included. Analysis of the windfall profits tax, the severance tax rate, and the Federal royalty rate assumed that the new TAPS tariffs had been adopted. The specific revenue impact is dependent upon the crude oil price assumed and transportation costs.

Significant production from Federal leases is not expected to occur before the year 2000. Therefore, reducing the Federal royalty rate would not impact Federal or State revenues during the study period.

The windfall profits tax would generate substantial revenues only in conjunction with high world oil prices. At the highest price levels considered in the study (\$27-\$33 in 1985 dollars), elimination of the tax on North Slope crude production would reduce Federal revenues by about \$1.5 billion in 1985 dollars before the scheduled phase-out of the tax in 1993. With oil prices at the mid-point (\$20.50-\$22.10) of the range considered, the tax would only apply in 1992 and 1993 when the projected wellhead value (in 1985 dollars) of North Slope crude rises above the \$17.85 per barrel base price, and elimination of the tax in 1987 would reduce Federal revenues by only \$100 million or less. State of Alaska revenues would not be significantly affected, since elimination of the tax would result in little, if any, increase in total production.

Reductions in State of Alaska severance tax rates would result in significant net revenue losses to the State and gains to the Federal Government. A 25 percent reduction in severance tax rates would cost the State of Alaska about \$4.5 billion by the year 2000 despite stimulating additional production in 2000 of more than 10,000 B/D. On the other hand, the Federal Government would realize roughly \$2.8 billion of additional revenues over that time period. A 50 percent severance tax reduction would reduce State of Alaska revenues through 2000 by roughly \$9.0 billion, while increasing Federal revenues by \$5.6 billion.

Reduction in total transportation costs due to the new TAPS tariffs will increase State of Alaska revenues and decrease Federal revenues during the study period. With mid-range oil price assumptions, these tariffs are estimated to reduce Federal revenues through the year 2000 by roughly \$4 billion, despite increased production of more than 70,000 B/D in the year 2000 relative to production with the old tariffs. In contrast, the State of Alaska is projected to gain about \$8.6 billion. The marked disparity between governments arises from the substantial increase in State royalty and severance tax payments, which are deductible from income for Federal taxes.

3. Petroleum Industry Impacts

Increasing the incentives to produce Alaska North Slope oil would have significant impacts on that segment of the petroleum industry with exploration and development activities in North Alaska, but would have negligible impact on the lower-48 petroleum industry. In 1986, proven reserves in North Alaska equalled about 7.1 billion barrels. Each one dollar increase in the ANS wellhead price, consequently, creates a 7.1 billion dollar increase in the assets of North Slope producers. Also, with production of about 1.8 million B/D on the North Slope, each one dollar per barrel increase in the

wellhead price increases producer gross revenues by about \$657 million per year. Much of this increase in gross revenues does not stay with the petroleum companies. State and Federal taxes reduce these revenues by about 55 to 65 percent so that net producer revenues for a one dollar increase in the wellhead crude price equals about \$260 million per year.

The increase in production stemming from implementing any of the policy options described is not enough to have a significant impact on the lower-48 refinery and market conditions, and no other significant petroleum industry impacts are anticipated as a consequence of the various policy options.

4. Consumer Impacts

None of the policy options considered would have a direct impact on the Valdez FOB price. However, the small increase in ANS crude oil production stimulated by a change in the incentives would reduce the demand for OPEC oil and create a slight downward pressure on the world oil price. While that price change is small, it would affect a large quantity of oil, and the amount spent on oil by U.S. consumers would decrease. Analysis based on the Energy Information Administration model used for world oil price projections indicates that implementing the TAPS settlement tariff will result in a 5 cents to 12 cents/bbl decrease in world oil price by the year 2000. This drop in oil price will result in a savings to consumers of \$300 - \$750 million per year (see Table III-4). Reduction in the severance tax rate would reduce oil prices by up to 5 cents/bbl in the year 2000 resulting in savings of up to \$300 million per year.

5. Transportation Impacts

The additional amount of shipping capacity that would be required to accommodate the increase in ANS production arising from implementation of the policy options considered is minimal. Changing the TAPS tariffs has the greatest impact on production of any of the policy options analyzed resulting in an additional 8,800 B/D in 1990. If all of this additional production is shipped to the Gulf/East Coasts (which is the destination that requires the most shipping), there will be the need for an additional 60,000 DWT in shipping capacity. This would require the full-time use of one 60,000 DWT tanker. If the additional crude is shipped to the West Coast, an additional 17,000 DWT will be required -- the equivalent of using a 90,000 DWT tanker for about two months a year. The net effect is an increase in shipping of between four-tenths of one percent to just about one percent.

The largest oil production response for the year 2000 is 75,200 B/D. Such an increase in production would require an increase of 149,000-511,000 DWT in shipping capacity. Although implementation of one of the policy options would mean that more shipping capacity

is being used, there would still be sufficient available tanker tonnage. The minimal increase in shipping requirements predicted could be met with existing tonnage, since ANS production is expected to decline in the future. There would be no need for the construction of any new tonnage to handle the small increase in production predicted.

6. Employment Impacts

Alaska North Slope oil production increases, caused by changes in Federal and State taxes, pipeline tariffs, and Federal leasing policies, are expected to have a relatively small impact on U.S. employment. Employment increases may occur in the Alaskan oil industry, in the shipping industry, and other Alaskan sectors. The most important employment effects would occur in Alaska's oil and gas extraction industry, classified in the Standard Industrial Classification as SIC 13. In particular, ANS oil-related employment effects of each of the six policy options analyzed affect not more than about five percent of total industry employment (see Table III-5). Employment effects in shipping are similar in magnitude to those in oil and gas extraction (see Table III-6). Increases range up to 134 seafarers or 3.16 percent of 1984 seafaring employment. Effects on seafaring employment are 50-60 percent as large as those projected for SIC 13 oil and gas extraction industries.

Other sectors may be affected by increased incentives as well. The petroleum refining sector, SIC 291, only employed 202 workers in Alaska during 1984. Therefore, increased refinery employment should not affect the area's economy nearly as much as employment increases in oil and gas extraction. Also, workers are needed to maintain the Trans-Alaska Pipeline System (TAPS). However, now that the TAPS is in place, few if any additional workers should be needed if ANS production is increased. Other sectors such as services in the North Slope area and construction are likely to experience small employment increases if ANS crude oil production increases. It is, however, very difficult to estimate these effects. Finally, changes in State and local revenues caused by implementing a policy option would impact the level of government employment. The size of these impacts depends on how the State and local governments react to changes in revenues and is difficult to predict.

An explanation of the methodology used to estimate employment impacts for the oil and gas extraction industry and the shipping industry is included in Technical Appendix C.

7. Trade and National Security Impacts

Financial incentives that result in increased ANS oil production during the 1987-2000 period yield positive trade and energy security benefits. Any increase in oil production from the North Slope directly reduces the amount of crude oil imported, lowering the

balance of trade deficit and decreasing U.S. reliance on foreign supplies.

Since the supply responses associated with the policy options considered are small, the trade benefits are small. For 1990, the largest supply response projected is 8,800 B/D. This increase would reduce the annual trade deficit by about \$77 million. A 75,200 B/D increase in the year 2000 would reduce the trade deficit by about \$892 million. In comparison, the trade deficit for 1985 was well over \$100 billion.

The impact that an increase in production would have on the world oil price is very small (see Section III-B-4). Still, to the extent that the amount of oil imported is reduced, U.S. vulnerability to supply disruptions could be reduced. It is important, however, to remember that increasing the incentives to produce oil will change the future timing of oil production, causing an increase in near-term production (the next 20-30 years) and a decrease in far-term production (see Section III-B-1). Along with the benefits of increased energy security in the near-term are the costs of possible increased foreign dependence in the future.

8. Foreign Policy

The policy options analyzed in Section III of this study, which involve changes in the Federal and State tax systems, pipeline tariffs, and Federal leasing policies are primarily domestic in their effects and should be evaluated accordingly. There is, however, an international aspect to these changes. In the Agreement on an International Energy Program, the United States agreed with other industrial democracies to enhance energy security by encouraging indigenous energy production. The Administration has already taken great strides toward encouraging energy production in the United States by restoring market incentives to the oil and natural gas industries and by partially deregulating the rail and trucking industries, including the transport of coal and other energy products. To the extent changes in tax policies, pipeline tariffs, and Federal leasing policies increase energy production in the United States, the United States enhances its energy security, consistent with an important international agreement with friends and allies.

9. Environmental Impacts

Environmental impacts stemming from increased incentives to produce oil from ANS, including impacts from increased exploration and drilling activity and from increased volumes of oil shipped in tankers, would be negligible.

Of environmental impacts from tanker transportation, by far the greatest proportion of adverse effects (e.g., spills and air pollution) occur in loading, unloading, and in maneuvering in or

near port. Increased production from the North Slope would cause an increase in tanker traffic in the Valdez area. However, because the United States is an oil importer, increased production from ANS would decrease oil imported from abroad and the total amount of oil landed at destination ports would not increase.

Increased incentives to produce oil would result in an increase in adverse impacts associated with exploration and drilling activity. However, these impacts can be mitigated by limiting access to environmentally sensitive areas. Further, all exploration and development plans must be approved and environmental permits must be obtained before a field can be developed.

In any case, the increase in production associated with implementing any of the policy options analyzed and the resulting increase in volume of oil shipped from Valdez are almost negligible. Therefore, unless the incentives to produce are increased by far more than they would be under the policy options analyzed, there will be no significant environmental impacts.

TABLE III-1

IMPACT OF POLICY OPTIONS ON RETURN TO PRODUCER
SHOWN AS EQUIVALENT CHANGE IN WELLHEAD PRICE
(\$1985/Barrel)

<u>Policy Option</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
1. Federal and State Taxation				
Exempt all ANS oil from WPT -				
Base Case (3)	18.58	19.68		
Equivalent Wellhead Price	20.28	23.98		
Ratio - Equivalent/Base Case	1.091	1.218		
Reduce severance tax by 25% -				
Base Case (2)	16.09	16.69	21.38	26.89
Equivalent Wellhead Price	16.80	17.43	22.32	28.09
Ratio - Equivalent/Base Case	1.044	1.044	1.044	1.044
Reduce severance tax by 50% -				
Base Case (2)	16.09	16.69	21.38	26.89
Equivalent Wellhead Price	17.50	18.88	23.26	29.27
Ratio - Equivalent/Base Case	1.088	1.131	1.088	1.088
2. Pipeline Tariffs				
Change to new (settlement) TAPS tariffs -				
Base Case (1)	14.44	13.58	16.46	20.70
New Wellhead Price	16.09	16.69	21.38	26.89
Ratio - New/Base Case	1.114	1.229	1.299	1.299
3. Federal Leasing Policies				
Reduce royalty rate by 25% -				
Base Case (2)	16.09	16.69	21.38	26.89
Equivalent Wellhead Price	16.66	17.29	22.15	27.86
Ratio - Equivalent/Base Case	1.036	1.036	1.036	1.036
Reduce royalty rate by 50% -				
Base Case (2)	16.09	16.69	21.38	26.89
Equivalent Wellhead Price	17.24	17.95	22.91	28.81
Ratio - Equivalent/Base Case	1.072	1.075	1.072	1.071

(1) Base case is with old (pre-settlement) tariffs and mid-point prices.

(2) Base case is with new (settlement) tariffs and mid-point prices.

(3) Base case is with new (settlement) tariffs and high prices.

TABLE III-2

SUPPLY RESPONSE FROM IMPLEMENTATION OF POLICY OPTIONS
(Thousand B/D)

<u>Policy Option</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
1. Federal and State Taxation				
Exempt all ANS oil from WPT - (assuming high prices)				
Amnt of oil affected	1,520	1,050		
Supply Low	0.0	0.0		
Response Medium	0.0	5.2		
High	0.0	10.4		
Reduce severance tax by 25% -				
Amnt of oil affected	1,800	1,700	1,550	1,400
Supply Low	0.0	0.0	3.3	6.1
Response Medium	0.0	1.8	6.7	12.2
High	0.0	3.7	10.0	18.4
Reduce severance tax by 50% -				
Amnt of oil affected	1,800	1,700	1,550	1,400
Supply Low	0.0	0.0	6.5	11.9
Response Medium	0.0	5.2	13.1	23.9
High	0.0	10.5	19.7	36.0
2. Pipeline Tariffs				
Change to new (settlement) TAPS tariffs -				
Amnt of oil affected	1,800	1,700	1,550	1,400
Supply Low	0.0	0.0	20.4	37.1
Response Medium	0.0	8.8	41.1	75.2
High	0.0	17.6	62.0	114.3
3. Federal Leasing Policies				
Reduce royalty rate by 25% -				
Amnt of oil affected	negl	negl	negl	negl
Supply				
Response	--	--	--	--
Reduce royalty rate by 50% -				
Amnt of oil affected	negl	negl	negl	negl
Supply				
Response	--	--	--	--

TABLE III-3

CUMULATIVE CHANGES IN GOVERNMENT RECEIPTS
(Billions of 1985 dollars)

	<u>Total</u>	<u>Corporate Income</u>	<u>Severance Tax</u>	<u>Royalties</u>
<u>Alaska Severance Tax</u>				
<u>25% Reduction:</u>				
Federal Government.	<u>2.8</u>	<u>2.8#</u>	<u>n/a</u>	<u>n/a</u>
1987 - 1990	.7	.7	n/a	n/a
1991 - 1995	1.0	1.0#	n/a	n/a
1996 - 2000	1.1	1.1	n/a	n/a
State of Alaska	<u>(4.5)</u>	<u>.5</u>	<u>(5.1)</u>	<u>.1</u>
1987-1990	(1.2)	.1	(1.3)	*
1991-1995	(1.6)	.2	(1.8)	*
1996-2000	(1.8)	.2	(2.0)	.1
<u>50% Reduction:</u>				
Federal Government	<u>5.6</u>	<u>5.6#</u>	<u>n/a</u>	<u>n/a</u>
1987 - 1990	1.3	1.3	n/a	n/a
1991 - 1995	2.0	2.0	n/a	n/a
1996 - 2000	2.3	2.3#	n/a	n/a
State of Alaska	<u>(9.0)</u>	<u>1.1</u>	<u>(10.2)</u>	<u>.2</u>
1987 - 1990	(2.4)	.3	(2.7)	*
1991 - 1995	(3.2)	.4	(3.6)	*
1996 - 2000	(3.5)	.4	(4.0)	.1

n/a - not applicable

- includes windfall profit tax liabilities in 1992 - 1993.

* - less than \$50 million.

NOTE: Table may not add due to rounding.

TABLE III-3 (continued)

CUMULATIVE CHANGES IN GOVERNMENT RECEIPTS
(Billions of 1985 dollars)

	<u>Total</u>	<u>Corporate Income</u>	<u>Windfall Profit</u>	<u>Severance Tax</u>	<u>Royalties</u>
<u>NEW 'TAPS' Tariffs: Mid-Range Prices</u>					
Federal Government	(4.0)	(4.0)	.1	n/a	n/a
1987-1990	(.9)	(.9)	-	n/a	n/a
1991-1995	(1.5)	(1.5)	.1	n/a	n/a
1996-2000	(1.6)	(1.6)	n/a	n/a	n/a
State of Alaska	8.6	(.7)	n/a	4.7	4.6
1987-1990	1.4	(.1)	n/a	.8	.8
1991-1995	3.0	(.3)	n/a	1.7	1.6
1996-2000	4.1	(.3)	n/a	2.2	2.2
<u>Eliminate Federal Windfall Profit Tax</u>					
Mid-Range Prices:	(.1)	.1	(.1)	n/a	n/a
1987-1980	-	-	-	n/a	n/a
1991-1995	(.1)	.1	(.1)	n/a	n/a
High-Price Path:	(1.5)	(1.3)	(2.8)	n/a	n/a
1987-1990	(.8)	.7	(1.5)	n/a	n/a
1991-1995	(.7)	.6	(1.3)	n/a	n/a

Source: Department of the Treasury

TABLE III-4
IMPACT ON CONSUMER EXPENDITURE FOR
PETROLEUM PRODUCTS FROM THE PRODUCTION INCENTIVES

Production Incentives -----	1990		1995		2000	
	Reduction in world oil price (cents per gallon)	Reduction in consumer expenditures (ml. dollars/yr)	Reduction in world oil price (cents per gallon)	Reduction in consumer expenditures (ml. dollars/yr)	Reduction in world oil price (cents per gallon)	Reduction in consumer expenditures (ml. dollars/yr)
1. Federal and State Taxation						
Exempt all AMS oil from WPT	negl.	negl.	-	-	-	-
Reduce State Severance Tax						
by 25%	0-1	0-59	0-2	0-121	0-6	0-367
by 50%	0-2	0-117	0-3	0-302	0-11	0-673
2. Pipeline Tariffs						
Change to New TAPS Tariff	0-4	0-235	2-13	0-785	3-31	0-1899
3. Federal Leasing Policies						
Reduce Royalty Rate						
by 25%	negl.	negl.	negl.	negl.	negl.	negl.
by 50%	negl.	negl.	negl.	negl.	negl.	negl.

Source: Energy Information Administration, Oil Market Simulation (OMS) Model runs for Oil Production Sensitivity Cases 1990-2000, 3/21/86.

TABLE III-5

ESTIMATED INCREASES IN ANS OIL-RELATED
SIC 13 EMPLOYMENT
DUE TO INCREASED INCENTIVES

<u>Policy Option</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
1. Federal and State Taxation				
Exempt all ANS oil from WPT				
Number of workers	0	22		
Percent of total	0.00%	0.31%		
25% severance tax cut				
Number of workers	0	8	28	52
Percent of total	0.00%	0.11%	0.43%	0.87%
50% severance tax cut				
Number of workers	0	22	56	101
Percent of total	0.00%	0.31%	0.85%	1.71%
2. Pipeline Tariffs				
Change to new (settlement) TAPS tariffs				
Number of workers	0	37	174	319
Percent of total	0.00%	0.52%	2.65%	5.37%
3. Federal Leasing Policies				
25% royalty rate cut				
Number of workers	negl.	negl.	negl.	negl.
Percent of total				
50% royalty rate cut				
Number of workers	negl.	negl.	negl.	negl.
Percent of total				

Source: U.S. Department of Labor (ILAB). Methodology described in Technical Appendix C.

TABLE III-6

ESTIMATED INCREASES IN ANS OIL-RELATED
SHIPPING EMPLOYMENT
DUE TO INCREASED INCENTIVES

<u>Policy Option</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
1. Federal and State Taxation				
Complete WPT exemption				
Number of workers	0	11		
Percent of total	0.00%	0.26%		
25% severance tax cut				
Number of workers	0	3	14	28
Percent of total	0.00%	0.07%	0.33%	0.66%
50% severance tax cut				
Number of workers	0	11	29	54
Percent of total	0.00%	0.26%	0.68%	1.27%
2. Pipeline Tariffs				
Change to new (settlement) TAPS tariffs				
Number of workers	0	14	71	134
Percent of total	0.00%	0.33%	1.67%	3.16%
3. Federal Leasing Policies				
25% royalty rate cut				
Number of workers	negl.	negl.	negl.	negl.
Percent of total				
50% royalty rate cut				
Number of workers	negl.	negl.	negl.	negl.
Percent of total				

Source: U.S. Department of Labor (ILAB). Methodology described in Technical Appendix C.

IV. POLICY OPTIONS PERTAINING TO ANS EXPORT RESTRICTIONS

Task IV involves an analysis of the economic and public policy issues related to lifting the export ban on Alaskan (ANS) crude oil. The five export scenarios to be analyzed are those specified in Section 126 of the Export Administration Act Amendments of 1985. These scenarios involve exports at 50 thousand barrels per day (MB/D), 100 MB/D, 200 MB/D, 500 MB/D and Unconstrained Exports (i.e., Free Market) levels.

The economic and policy analysis covers the 1987-2000 period. 1987 was selected as the first year because it was determined to be the earliest effective date by which Congress could make any changes in the current export prohibition on crude oil. The year 2000 was selected because it provided a sufficient time span against which to measure the long-term price elasticity of oil supply and related energy/economic impacts of lifting the ban. The section was well into preparation before the recent oil price declines occurred. Since the analysis is for the 1987-2000 timeframe, the price projections used may still be reasonable, despite the current and perhaps temporary low world oil prices. Although this chapter does not include econometric projections regarding the impact of the recent and perhaps temporary oil price declines on ANS production with and without a ban on exports, the oil price decline issue is addressed in Section VI.

Much of the analysis presented in Section IV comes from the operation of the Oil Trade Model (OTM). The model simulates the international petroleum production, refining, and transportation markets. The model uses a non-linear optimization technique to maximize the sum of producers' and consumers' surplus, subject to production constraints, consumer demand for products, transportation costs, refinery costs and technology, and taxes. The model can be used to determine the effects of government policy or international events on crude and product supply, demand, prices, and flows. Technical Appendix D provides a more complete model description.

A. EXPORT TRADE FLOWS

The trade flows associated with lifting the ban on Alaskan crude exports include: (1) the redistribution of domestic oil trade, and (2) oil exports to Pacific Rim Nations.

1. Domestic Energy Flows

The patterns of Alaskan oil trade are likely to undergo substantial changes between 1987-2000 that are independent of the export scenarios discussed later in this section. These changes center on: (1) the declines in Alaskan oil production projected during the

1990s, (2) the opening of the California-to-Texas All America Pipeline after 1987, and (3) the gradual reduction of the Valdez-Gulf and Valdez-Virgin Island/Puerto Rico trade.

The data in Tables IV (A) 1 through IV (A) 8 show the expected trade flows for the export ban case:

o West Coast

- Shipments of ANS crude to PAD V rise from the current level of one million barrels per day (MMB/D) to about 1.35 MMB/D by 1995.
- After 1995 shipments begin to decline slowly because ANS production is projected to fall from about 1.55 to 1.4 MMB/D by 2000.

o Gulf Coast/East Coast

This trade declines from the current levels of 630 MB/D to approximately 180 MB/D by 2000 because:

- There is less oil to ship due to ANS production falling from 1.8 to 1.4 MMB/D between 1990-2000.
- The All American Pipeline, commencing in 1987, will begin to move crude overland from California to Texas and by 1990 approximately 300 MB/D of California crude will move to the Gulf Coast by pipeline thus allowing an equal amount of Alaskan crude to remain in California rather than being shipped in tankers to the Gulf Coast.

IV-3

TABLE IV (A) 1
TRADE FLOW-EXPORT BAN CASE
(M B/D)

<u>Export Ban</u>	<u>1985</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
West Coast	1,000	1,020	1,160	1,350	1,220
East Coast/ Gulf Coast	630	650	515	200	180
Virgin Islands/ Puerto Rico	128	130	25	0	0
Pacific Rim	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	1,758*	1,800	1,700	1,550	1,400

*Source-MARAD estimate based upon actual date January-September 1985.
Includes 300,000 B/D California-to-Texas pipeline commencing after 1987.

IV-4

TABLE IV (A) 2
PAD V (WEST COAST) OIL BALANCE
(MMB/D)

	<u>1985</u>	<u>1990</u>		<u>1995</u>		<u>2000</u>	
		<u>BAN</u>	<u>EXPORTS</u>	<u>BAN</u>	<u>EXPORTS</u>	<u>BAN</u>	<u>EXPORTS</u>
<u>DEMAND:</u>							
Product Consumption	2.37	2.30	2.29	2.43	2.42	2.61	2.60
Refinery Fuel	<u>0.17</u>	<u>0.23</u>	<u>0.23</u>	<u>0.24</u>	<u>0.23</u>	<u>0.18</u>	<u>0.17</u>
Total	2.54	2.53	2.52	2.67	2.65	2.79	2.77
<u>SUPPLY:</u>							
Alaska Crude Production	1.79	1.73	1.73	1.58	1.58	1.40	1.40
California Crude Production	1.15	1.42	1.42	1.32	1.32	1.32	1.32
Natural Gas Liquids (NGL)	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Crude Oil Imports	0.18	0.08	0.26	0.13	0.25	0.27	0.20
Net Product Imports (0.23)		(0.04)	(0.05)	(0.06)	(0.10)	0.04	0.17
Product Shipments From Other U.S. Regions	(0.09)	(0.04)	0.10	(0.03)	0.10	(0.01)	0.11
Crude Shipments to Gulf Via All American Pipeline		(0.30)	(0.30)	(0.30)	(0.30)	(0.30)	(0.30)
Refinery Gain	<u>0.30</u>	<u>0.18</u>	<u>0.19</u>	<u>0.18</u>	<u>0.18</u>	<u>0.21</u>	<u>0.19</u>
Total	3.36	3.07	3.39	2.86	3.17	2.97	3.13
<u>EXCESS CRUDE OIL SUPPLY:</u>							
Ban to Gulf/East Coast	0.82	0.54		0.19		0.18	
Unconstrained Exports to Pacific Rim	-	-	<u>0.87</u>	-	<u>0.52</u>	-	<u>0.36</u>
Total	0.82	0.54	0.87	0.19	0.52	0.18	0.36

Source: Department of Energy

IV-5

TABLE IV (A) 3TRADE FLOW-LOW EXPORT CASES (50 M B/D)
(M B/D)

<u>50 M B/D Exports</u>	<u>1985</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
West Coast	1,000	1,020	1,175	1,360	1,350
East Coast/ Gulf Coast :	630	630	475	140	0
Virgin Islands/ Puerto Rico	128	100	0	0	0
Pacific Rim	<u>0</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>
	1,758*	1,800	1,700	1,550	1,400

*Source-MARAD estimate based upon actual date January-September 1985.
Includes 300,000 B/D California-to-Texas pipeline commencing after 1987.

IV-6

TABLE IV (A) 4TRADE FLOW-LOW EXPORT CASES (100,000 B/D)
(M B/D)

<u>100 M B/D Exports</u>	<u>1985</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
West Coast	1,000	1,020	1,175	1,360	1,220
East Coast/ Gulf Coast	630	600	425	150	0
Virgin Islands/ Puerto Rico	128	80	0	0	0
Pacific Rim	<u>0</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
	1,758*	1,800	1,700	1,550	1,400

*Source-MARAD estimate based upon actual data January-September 1985.
Includes 300,000 B/D California-to-Texas pipeline commencing after 1987.

TABLE IV (A) 5TRADE FLOW-LOW EXPORT CASES (200 M B/D)
(M B/D)

<u>200 M B/D Exports</u>	<u>1985</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
West Coast	1,000	1,020	1,175	1,250	1,200
East Coast/ Gulf Coast	630	555	325	100	0
Virgin Islands/ Puerto Rico	128	25	0	0	0
Pacific Rim	<u>0</u>	<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>
	1,758*	1,800	1,700	1,550	1,400

*Source-MARAD estimate based upon actual data January-September 1985. Includes 300,000 B/D California-to-Texas pipeline commencing after 1987.

TABLE IV (A) 6TRADE FLOW-500 M B/D EXPORT CASE
(M B/D)

<u>500 M B/D Exports</u>	<u>1985</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
West Coast	1,000	975	1,100	1,000	1,040
East Coast/ Gulf Coast	630	500	100	50	0
Virgin Islands/ Puerto Rico	128	25	0	0	0
Pacific Rim	<u>0</u>	<u>300</u>	<u>500</u>	<u>500</u>	<u>360</u>
	1,758*	1,800	1,700	1,550	1,400

*Source-MARAD estimate based upon actual data January-September 1985.
Includes 300,000 B/D California-to-Texas pipeline commencing after 1987.

IV-9

TABLE IV (A) 7TRADE FLOWS-UNCONSTRAINED EXPORTS CASE (HALF OF PRODUCTION)
(M B/D)

	<u>1985</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
West Coast	1,000	975	830	1,020	1,040
East Coast/ Gulf Coast	630	500	0	0	0
Virgin Islands/ Puerto Rico	128	25	0	0	0
Pacific Rim	<u>0</u>	<u>300</u>	<u>870</u>	<u>530</u>	<u>360</u>
	1,758*	1,800	1,700	1,550	1,400

*Source-MARAD estimate based upon actual data January-September 1985.
Includes 300,000 B/D California-to-Texas pipeline commencing after 1987.

- California prefers to refine ANS crude in its refineries because of a lighter product yield and for environmental reasons and move its heavy crudes to the Gulf Coast.
- o Virgin Islands/Puerto Rico - This tanker trade is likely to phase out as West Coast deliveries of ANS crude increase.

There has been discussion in the industry and trade press of the possible construction of a 900 MB/D pipeline from the West Coast to Texas in the late 1980s. Construction of such a pipeline could result in the total elimination of ANS crude shipments to the Gulf/East Coasts. The construction of a second California/Texas pipeline is only at a preliminary stage of commercial discussions. Lifting the ban on Alaskan crude oil exports is likely to reduce the economic viability of a large West-to-East pipeline and virtually eliminates any chance of its being constructed.

2. Export Trade Flows

All of the export scenarios yield similar results. ANS shipments to the West Coast are expected to rise from the current level of about 1 MMB/D to a high of 1.36 MMB/D by 1995 before slowly declining to 1.22 MMB/D by the year 2000 (see Table IV (A) 1). The reason for this decline is solely due to an anticipated decline in ANS production from the current level of 1.75 MMB/D to 1.4 MMB/D. By the year 2000, the West Coast is expected to receive all but 180 MB/D of ANS production.

As this occurs, ANS shipments to the East and Gulf Coasts are expected to decline steadily from the current level of 630 MB/D to 180 MB/D in the year 2000. It should be noted that, in the event that the All-America Pipeline is able to transport volumes above 300 MB/D, shipments to the Gulf and East Coasts will be eroded further or possibly eliminated. The Pipeline's sponsors have indicated that its capacity could be expanded by an additional 150 MB/D to 450 MB/D. To the extent that the capacity of the All-America Pipeline exceeds 300 MB/D, the California-to-Texas oil flows will reduce more rapidly tanker deliveries from Valdez to the Gulf Coast. Since this pipeline will move some of California's heavy crudes to other markets, the California crude surplus will begin to disappear, oil prices will move towards market levels, and discounts will end.

Sales to the Virgin Islands and Puerto Rico, currently about 130 MB/D will likely drop to 25 MB/D by 1990 and be eliminated shortly thereafter. Likewise, these sales will be eliminated earlier if the All-America pipeline transports higher volumes than anticipated. Tables IV (A) 2-7 present data on all of the energy trade flows associated with the export scenarios. In particular, Table IV (A) 2, addresses the trade flows in the context of the overall West Coast petroleum balance.

o Unconstrained Exports/500 MB/D Cases

- Exports begin to decline in 1990 in the Unconstrained Export Case and in the next highest case after 1995.
- There is a growing demand for ANS crude on the West Coast.
- The California market can compete favorably with the Pacific Rim in terms of ANS crude prices because of growing demand and the fact that the freight rate from Valdez to West Coast is anticipated to decline while foreign rates are projected to rise.
- By 1995, the Valdez/West Coast freight rate is only an estimated \$0.14 per barrel higher than the Valdez/Far East rate - i.e., \$0.73 versus \$0.87 per barrel.

o California

- Table IV (A) 2 shows that rising California oil demand combined with lower ANS and California oil output results in less ANS oil available for export after 1990. This finding also holds for the partial export scenarios after 1995.
- Between 1990 and 1995 PAD V oil demand increases from 2.52 MMB/D to 2.67 MMB/D while Alaska oil output declines by 0.15 MMB/D.
- If large ANS exports during the 1990s were to reduce the availability of crude supplies for PAD V, this region would face the prospect of higher crude and product imports. If petroleum products rather than crude are imported, a negative impact on West Coast refiners and consumers could result (see Section IV C and D).

3. Export Markets

In terms of transportation costs, the Pacific Rim is the second most profitable market for ANS crude sales after the West Coast. The 3,300 mile voyage currently costs approximately \$0.40 and up to \$1.00 per barrel in foreign and U.S. tankers, respectively.

- Under the 50 and 100 MB/D scenarios, the entire volume could be absorbed by Japan through the year 2000.
- Under the 200 MB/D scenario, it is anticipated that Japan would purchase the bulk of the oil and that other Pacific Rim countries might purchase the remaining volumes through the year 2000.

- Under the 500 MB/D scenario, it is expected that Pacific Rim imports would peak at 500 MB/D during 1990-95 and decline to 360 MB/D by the year 2000 due to reduced ANS production and price competition from the U.S. West Coast that needs ANS crude. Other Pacific Rim countries are expected to purchase the remaining export volumes through 1995.
- Under the unconstrained exports scenario, it is expected that total exports to the Pacific Rim would peak in 1990 at about 870 MB/D, with Japan purchasing over 600 MB/D (Table IV (A) 8).
- It is important to note that these projections are based on the assumption that foreign purchasers are supplying their own shipping and obtaining ANS crude at the Valdez FOB price. These projections could vary significantly because they do not account for institutional factors regarding trade relations between ANS producers, shippers and U.S. customers. For example, these projections do not take into account a possible decision by an ANS producer to use his own domestic vessels to maintain structural relationships within its own company and commercial relationships with traditional customers.

- o crude oil exported to Canada with a validated license. In 1985, the President determined that crude oil exports to Canada are in the national interest and made the necessary findings under the EPCA, the MLLA, and the OCSLA. The exporter must certify that the oil is for use or consumption in Canada, that the oil was not and will not be transported by pipeline over a Federal right-of-way granted under the Trans-Alaska Pipeline Authorization Act, and was not derived from the Naval Petroleum Reserves; and
- o crude oil exported from Cook Inlet with a validated license. In 1985, the Secretary of Commerce, with the concurrence of the Secretaries of State, Energy, and Treasury, determined that permitting the export of crude oil derived from Alaska's Cook Inlet is in the national interest and consistent with the purposes of the EPCA. Regulations were published in the Federal Register on June 4, 1986, which permit the issuance of validated export licenses for crude oil produced in state waters of Alaska's Cook Inlet and not subject to the restrictions contained in the EAA, the NPRPA, the OCSLA, or the MLLA.

IV-13

TABLE IV (A) 8

POSSIBLE EXPORT MARKETS FOR ANS CRUDE

(Thousand B/D)

<u>Scenario/year</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>50 MB/D</u>				
Japan	50	50	50	50
South Korea/Taiwan				
<u>100 MB/D</u>				
Japan	100	100	100	100
South Korea/Taiwan	-	-	-	-
<u>200 MB/D</u>				
Japan	150	150	150	150
South Korea/Taiwan	50	50	50	50
<u>500 MB/D</u>				
Japan	200	350	350	250
South Korea/Taiwan	100	150	150	110
<u>High Export Case</u>				
Japan	200	600	360	250
South Korea/Taiwan	100	270	170	110

Source: DOE Oil Trade Model

B. PETROLEUM INDUSTRY IMPACTS

1. Transportation Savings

The primary result of allowing Alaskan oil exports would be to provide significant transportation savings. From a purely economic perspective, transportation savings represent a resource efficiency gain.

- o Moving crude from Valdez, Alaska to the U.S. Gulf Coast costs approximately \$4/bbl.
- o Shipping the identical crude from Valdez to Japan yields a savings of approximately \$3.50 per barrel because U.S. ships are more expensive to operate than foreign flag vessels.

The savings from reduced transportation charges translate into higher wellhead prices for the producers and larger tax revenues for the Federal Government, and the States of Alaska and California.

- o Alaskan oil owners currently sell their oil at a \$1 - 2 per barrel discount on the West Coast.
 - This discount is less than the extra expense that would be incurred to ship the oil from Valdez to the Gulf Coast.
 - Under a free market scenario, the West Coast discount would disappear because excess Alaskan oil is likely to be shipped to the Pacific Rim rather than be sold at a discount in California.

2. Wellhead Price Impact

The complete removal of the restrictions on ANS crude exports would raise the wellhead value of Alaskan and Californian crude oils. The figures in Table IV (B) 1 indicate the following:

- o ANS Wellhead Price
 - Complete removal of the ban would raise the price by \$1.70 per barrel in 1990 declining to about \$1 per barrel in 2000, because of the transportation savings.
 - Partial lifting of the restrictions would have less significant price impacts. For example, partial decontrol resulting in exports of 500 MB/D yields a wellhead increase of \$0.70 per barrel in 1990. Likewise, exports of 100 MB/D and 50 MB/D in 1990 raise wellhead prices by only \$0.10 and \$0.05 per barrel, respectively.

TABLE IV (B) 1
WELLHEAD PRICE IMPACTS
(1985 dollars per barrel)

	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>ALASKA NORTH SLOPE</u>				
Base Wellhead Price	\$16.90	\$16.69	\$21.38	\$26.89
Price Increase				
Unconstrained Exports	\$ 0.60	\$ 1.70	\$ 1.40	\$ 1.00
500 MB/D	0.60	0.70	0.74	1.00
200 MB/D	0.20	0.20	0.23	0.10
100 MB/D	0.10	0.10	0.12	0.05
50 MB/D	0.05	0.05	0.06	0.03

CALIFORNIA AVERAGE

Base Well Head Price	\$20.00	\$19.70	\$22.50	\$27.50
Price Increase				
Unconstrained Exports	\$ 0.15	\$ 1.60	\$ 1.60	\$ 1.30
500 MB/D	0.15	0.20	0.37	1.30
200 MB/D	neg	0.05	0.09	neg
100 MB/D	neg	0.02	0.05	neg
50 MB/D	neg	neg	0.02	neg

Source: Department of Energy

o California Wellhead Price

- The impacts of a complete lifting of the ANS ban are positive for California producers because the average State wellhead price increases by about \$1.60 per barrel in 1990 and \$1.30 per barrel in 2000.
- The benefits of partial relaxation of the ban are negligible in California with the exception of the 500 MB/D scenario, which would result in a \$0.37 bbl wellhead price increase in 1995.

3. Net Producer Revenues

Table IV (B) 2 shows an increase in producer revenues (net of Federal and State taxes) of \$7.7 billion for the 1987-2000 period resulting from a complete lifting of the ban. The net revenues are derived from: (1) wellhead price increases resulting from a lifting of the ban, and (2) oil production increases resulting from a lifting of the ban. (See IV (E) below.) This sum includes \$3.7 billion in net production profits in Alaska and \$4.0 billion in California.

TABLE IV (B) 2

NET OIL INDUSTRY PROFITS FROM LIFTING
THE ANS EXPORT BAN
 (Million 1985 dollars)

<u>Scenario</u>	<u>ALASKA</u>	<u>CALIFORNIA</u>	<u>TOTAL</u>
<u>Unconstrained Exports</u>	3,728.8	4,038.1	7,766.9
<u>500 MB/D</u>	2,167.8	1,410.2	3,578.0
<u>200 MB/D</u>	453.3	137.8	591.1
<u>100 MB/D</u>	226.7	68.9	295.6
<u>50 MB/D</u>	113.5	34.5	148.0

Source: Department of Treasury

Note: - Net producer profits derived by deducting Federal and State tax obligations from increased revenues flowing from a lifting of the export ban.

These calculations do not address the costs to other sectors of the economy. (See Section IV (E) for a full discussion of State and Federal tax issues.) The table also shows that the benefits to producers vary in proportion to the amount of crude exported. At small export volumes, the benefits are low, but they increase proportionately at higher levels.

4. Exploration, Development and Production

This section provides estimates of the projected increase in crude oil production that would occur in Alaska and in California as a consequence of allowing the export of ANS crude oil. As described in the previous section, the removal of export restrictions raises the wellhead price of ANS crude oil. The higher wellhead crude prices provide incentives to increase ANS production both by extending the life of existing producing wells and by increasing exploration and development activities in new fields. Section III presents a general discussion of oil production impacts as well as leasing policy issues.

Table IV (B)(3) provides a series of forecasts of increased production from Alaska and California. For both Alaska and California, the highest supply response is in the unconstrained exports scenario:

o Alaska

- Exports at unconstrained levels could result in a production increase of 5 - 15 MB/D by 2000.
- A partial relaxation of the ban allowing only 500 MB/D in exports yields a production response of 2.5 - 15 MB/D response in 1995 and a 5-15 MB/D response in 2000.
- Partial lifting of the ban, with exports of 200, 100 and 50 MB/D, yields smaller supply responses..

o California

- The supply response is slightly higher for California than for Alaska under the unconstrained exports scenario. Production expands by 8.8 - 17.8 MB/D and 12 - 24 MB/D in 1995 and 2000, respectively.

TABLE IV (B) 3
CRUDE OIL PRODUCTION RESPONSE
(Barrels per day)

	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>ALASKAN NORTH SLOPE</u>			
Base Production	1,700,000	1,550,000	1,400,000
Production Increase			
Unconstrained Exports	0-8,000	4,600-14,000	5,000-15,000
500 MB/D	0-3,400	2,500- 7,600	5,000-15,000
200 MB/D	0- 800	800- 2,400	500-15,000
100 MB/D	0- 500	400- 1,200	250- 750
50 MB/D	0- 240	200- 600	150- 450
<u>CALIFORNIA</u>			
Base Production (*1)	1,430,00	1,320,00	1,320,000
Production Increase			
Unconstrained Exports	0-11,000	8,800-17,800	12,000-24,000
500 MB/D	0- 1,300	2,000- 4,000	12,000-24,000
200 MB/D	0- 350	500- 1,000	neg
100 MB/D	neg	300- 550	neg
50 MB/D	neg	100- 220	neg

*1. Excludes natural gas liquids

Source: Department of Energy

IV-20

- The 500 MB/D export scenario also results in a supply response of 12 - 24 MB/D; other scenarios yield only negligible production increases by 2000.

The issue of future petroleum exploration and development evoked varying responses from the parties that submitted comments in response to the Federal Register Notice. Parties as diverse as the Coalition to Save Alaskan Oil, Exxon and the State of Alaska all agree that future Alaskan production will decline substantially between 1995-2000.

- The Alaskan State Department of Revenue's forecast for 1995 production is 0.9 million B/D, as compared to the current production level of 1.758 million B/D.

Exxon notes that:

"Even with the strong emphasis industry has placed on developing new Alaskan crude reserves, it is likely that levels of North Slope production will decline through the mid-1990s."

C. REFINING IMPACTS

The impact of lifting the ban on ANS exports on U.S. refiners is primarily on the West Coast. The impacts on refiners stemming from a full or partial lifting of the export ban are quite different for Gulf Coast and West Coast refineries.

Our analysis indicates that allowing the export of Alaskan oil would have a negligible impact on Gulf Coast/East Coast refiners. After examining world oil supply availability and quality and U.S. refinery configurations, we conclude that most of the oil imported to replace ANS crude would be similar in quality and quantity and would not result in appreciably changed refinery operations or costs on the U.S. East and Gulf Coasts. On the other hand, several consumer groups such as the Citizen/Labor Energy Coalition have argued that the foreign oil imported into the Gulf Coast will be several dollars per barrel more expensive than ANS crude. This would raise refiners' acquisition costs and cut their profits, and may result in higher consumer prices. Recent DOE data, however, show that foreign crude is highly competitive with and even slightly lower priced than ANS crudes on the U.S. Gulf Coast.

The response to the Federal Register Notice included many comments from independent refiners, UNOCAL, TOSCO, the American Independent Refiners Association PAD V Committee, and the Edgington Oil Company, all of whom oppose lifting the ban on the grounds that it would harm them.

- o All of these concerns argue that lifting the export ban would:
 - Compromise their access to ANS crude.
 - Raise refiners costs.
 - Raise product prices.
 - Increase consumer prices.
 - Jeopardize independents' financial strength due to reduced margins.
 - Result in petroleum product imports at the expense of the independent refiners.

In the short run, West Coast refiners will be compelled to pay higher prices (i.e., up to several dollars per barrel) for ANS crude and crude imports if export controls are lifted. They will lose the "California discount" due to the fact that ANS crude will be able to

command its market price. However, some analysts believe that the West Coast refiners may not be compelled to make many of the additional capital investments during the 1990s to accommodate surplus heavy ANS crude because they will replace it with light Indonesian supplies. This development would represent a long-term efficiency gain to the national economy.

Distillation of Alaskan crude oil yields a large fraction of high-sulfur residual fuel, which requires special refining facilities for conversion into products such as gasolines and distillates. This type of refining capacity is in particularly short supply on the West Coast because the average quality of crude oils produced in California is unusually heavy and has a high sulfur content. (See Table IV (C) 1) As increased volumes of Alaskan oil shipped to the West Coast have displaced much of the lighter feedstock previously imported, the cost of refinery processing has become higher.

Although some modifications to existing West Coast refineries have taken place in recent years, additional investments exceeding \$1 billion would be required to process more efficiently the projected mix of crudes if Alaskan oil continues to be shipped to the West Coast. Even if the prohibition on exports continues, it is uncertain whether West Coast refineries would make an additional investment of this size. Some refiners may invest in additional conversion capacity in order to produce premium products from the heavy crudes on the West Coast market. Alternatively, some refineries may change refinery configurations to displace Alaskan oil with California production. However, there is a 3-to 4-year lead time between making a decision to invest in refinery expansion or reconfiguration and the facility becoming operational. The potential for Alaskan oil exports in the future makes investors understandably hesitant to lay out capital that would be drastically devalued if the export ban were lifted.

Although refining costs may diminish with removal of export restrictions, profits to West Coast refiners may decline. The profitability of conversion capacity depends upon a large differential between heavy and light products. The value of heavy crudes and high sulfur residual oil is expected to increase by more than the value of light products between 1995 and 2000, reducing the differential and hence the profitability of conversion capacity. Refiners' margins will narrow even though the higher prices for residual fuel oil will be passed along to the consumer.

- o The OTM finds that this would yield a series of positive benefits for the refining industry.
- Allowing exports would reduce the amounts of heavy crudes routed to West Coast refineries by about 90 MB/D in 1995.

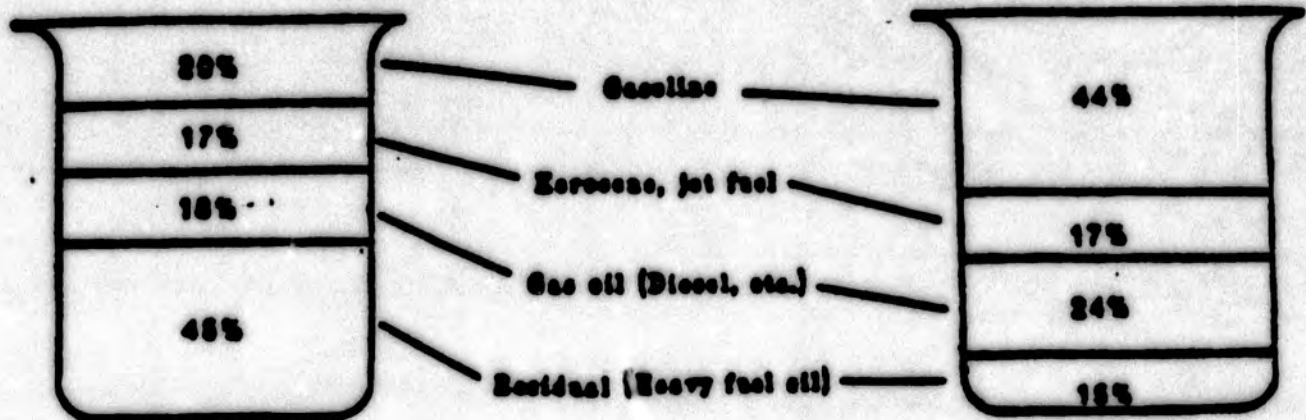
TABLE IV (C) 1

TYPICAL PRODUCT YIELDS FROM CRUDE OIL REFINING

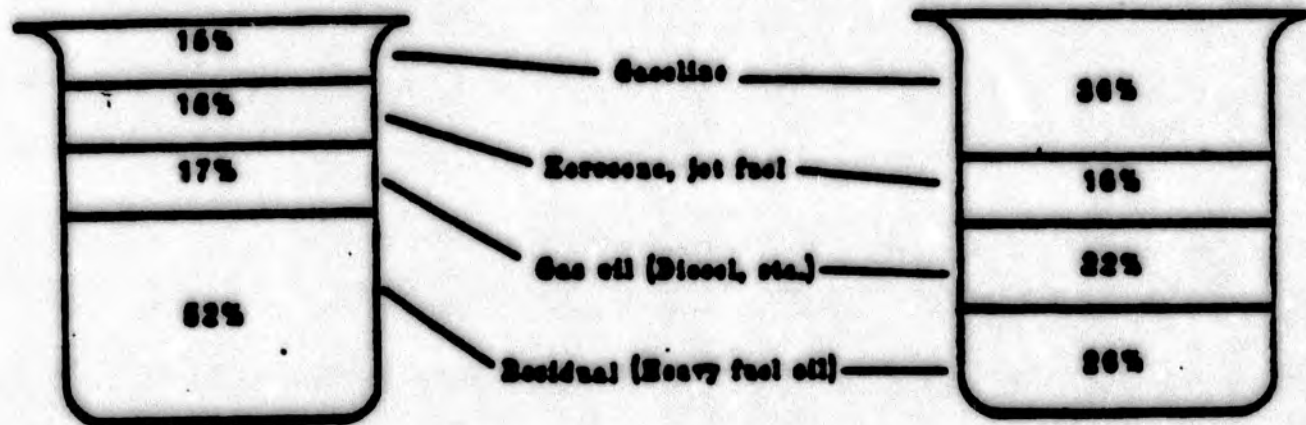
Simple Refining

Sophisticated Refining

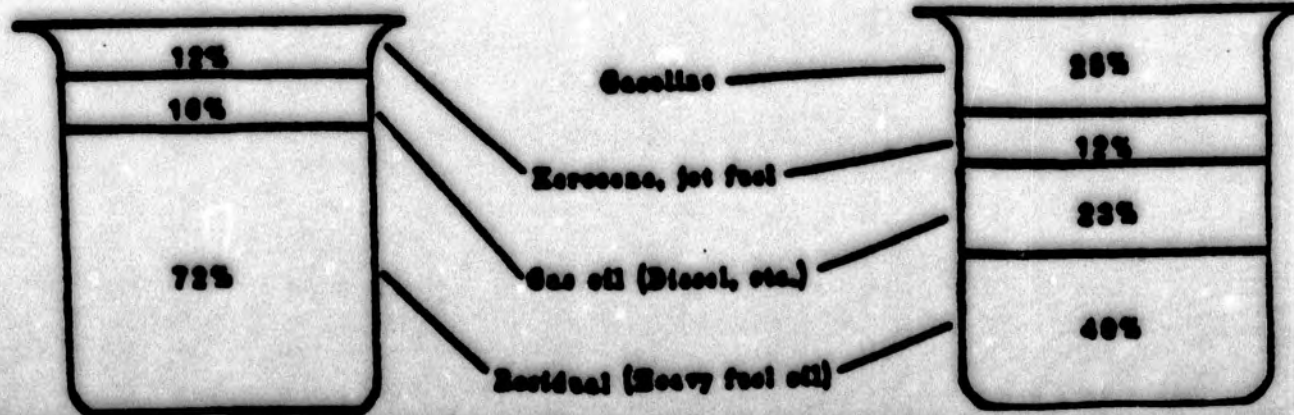
Saudi Arabian Light (33 API)



Alaska North Slope (26 API)



Kern R. California (14 API)



- Replacing heavy crude with lighter grades of oil from Pacific Basin suppliers such as Indonesia, combined with higher refinery utilization rates, would lead to a technically more favorable crude mix and refinery operation. This would result in refinery processing gains (i.e., net increases in petroleum products) and a favorable slate of light products.
- Removal of the export ban would result in a decrease in refining costs on the West Coast of 2 percent per year through 2000.
- Under some scenarios, there could be a reduction in the volume of residual fuel oil exports, which would be beneficial because resid is a low value product and the economy as a whole would benefit from exports of crude at market prices instead of sales of resid at lower prices.
- Resid exports have been high due in large part to low product prices; but higher product prices combined with lower refinery yields of resid could reduce these exports.

There are a number of interesting institutional questions regarding refinery impacts:

- Resid Exports - Private refiners, will decide on whether or not to export residual fuel oil.
- The refiner may have covered his profit margin on co-products such as gasoline and jet fuel and will take the price he can get to unload the by-product resid.
- In this regard, many independent refiners have no separate crude supplies as compared to the ANS producers. ANS producers could sell crude or products while the independent refiners do not have similar tradeoffs. They earn profits on light co-products and simply take what they can get for the resid.

D. CONSUMER IMPACTS

The consumer effects from allowing Alaskan oil exports can be divided into short-term and long-term impacts. The short-term effect involves a possible rise in prices for consumers on the West Coast, while the long-term effect consists of projected economic benefits to all U.S. consumers.

Our analysis indicates that product prices on the West Coast could rise in response to allowing Alaskan oil exports (See Table IV (D) 1). The amount of product price increase depends upon:

- o the costs of replacement crudes for Alaskan crude;
- o future refinery configurations and operations on the West Coast;
- o prices of product imports to the West Coast; and
- o the amount of wellhead price change of California and Alaskan oil in response to allowing Alaskan oil exports.

The ranges for petroleum product price impacts in Table IV (D) 1 reflect these uncertainties. Product price increases under unconstrained export conditions could vary between little, if any, price increase to cases with up to 5 cents per gallon. Factors which could tend to lower the West Coast price impact include: lower prices for replacement crudes due, for example, to lower world oil demand; more efficient refinery configurations and operations which reduce refinery costs; availability of low-cost product imports which set a cap on West Coast product prices; and a smaller wellhead price increase subsequent to allowing Alaskan oil exports.

Table IV (D) 2 shows the estimated impact on West Coast consumer expenditures due to projected product price increases. The impacts are largest in 1990 and diminish over time.

Over the long-term, the OTM finds that allowing exports of Alaskan oil would encourage increased crude production in Alaska and California. U.S. oil consumers could benefit from lower world oil prices resulting from these increases in crude oil production.

Even small world oil price reductions can have a large effect on consumer expenditures for petroleum products. A one penny per barrel decline in U.S. oil product prices by 1995, for example, would reduce annual consumer expenditures for petroleum products by about \$60 million. This one penny per barrel price decline would reduce gasoline expenditures by an estimated \$22 million per year.

TABLE IV (D) 1WEST COAST PRODUCT PRICE INCREASES
(1985 Dollars Per Gallon)

<u>Unconstrained Exports Scenario</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
High Sulfur Resid	Increase \$0.02-\$0.04	Increase neg-\$0.05	Increase neg-\$0.05
Low Sulfur Resid	Decrease (neg-\$0.02)	Decrease (neg-\$0.02)	Increase neg-\$0.01
Distillates	Increase neg-\$0.025	Increase neg-\$0.02	neg
Gasoline	Increase neg-\$0.025	Increase neg-\$0.02	neg
Other	Increase neg-\$0.025	Increase neg-0.02	neg
Average	Increase neg-\$0.02	Increase neg-\$0.02	Increase neg-\$0.05

NOTE: Estimates for 1987 are not provided since 1987 is a transition year for implementation of lifting restrictions on Alaskan oil exports.

TABLE IV (D) 2WEST COAST CONSUMER EXPENDITURE IMPACTS
(Million 1985 dollars)

	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>Unconstrained Exports Scenario</u>			
High Sulfur Resid	60-120	neg-160	neg-170
Low Sulfur Resid	Savings (neg-30)	Savings (neg-30)	neg-15
Distillates	neg-455	neg-385	neg
Gasoline	neg-220	neg-185	neg
<u>Other</u>	<u>neg-90</u>	<u>neg-75</u>	<u>neg</u>
Total	60-855	neg-775	neg-185

NOTE: Estimates for 1987 are not provided since 1987 is a transition year for implementation of lifting restrictions on Alaskan oil exports.

Table IV (D) 3 provides estimates of the impact of lifting the ban on consumer expenditures for petroleum products. Assuming the oil supply increases discussed in Section IV (B), total removal of export restrictions would yield \$200-300 million in reduced expenditures by the year 2000. The other cases that restrict exports to 200 MB/D or less have insignificant impacts on the world oil prices and thus result in essentially no reduction in consumer expenditures.

TABLE IV (D) 3
CONSUMER SAVINGS FROM LOWER WORLD OIL PRICES
(Million 1985 dollars)

	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>Unconstrained Exports</u>				
<u>Scenario</u>	0	\$0-120	\$120-250	\$200-300
500 MB/D	0	neg.	\$0-185	\$200-300
200 MB/D	0	neg.	neg.	neg.

Source: Energy Information, Oil Market Simulation (OMS) model runs for oil production sensitivity cases 1990-2000, 3/21/86.

E. FISCAL EFFECTS OF EXPORT OPTIONS

1. Federal Impacts

The export of North Slope crude would have a favorable impact on Federal revenues and an unfavorable impact on Federal expenditures as a result of displacement from service of U.S. flag tankers. During the 1987-1990 period, if the volume of export is less than 200,000 barrels per day (B/D), the expenditure effects are larger. In cases involving 200,000 B/D or more, the revenue effects are larger than expenditure impacts. The impacts to be discussed below are summarized in Table IV (E) 1.

Permitting exports of 200,000 B/D or more would prompt additional oil production in at least Alaska and California. Economic activity would be redirected to some extent through noticeably higher prices for petroleum products on the West Coast and slightly lower prices in the Gulf region through 1995. After 1995, lower petroleum prices generally would be expected in both regions. Assuming nominal GNP growth equivalent to the value of increased oil production, the revenue implications of three scenarios were evaluated:

- o Exports of up to 200,000 B/D would trigger Title XI guarantee outlays by the Federal Government of \$135 million before 1990 while generating \$134 million of additional revenues. From 1991 through 2000, an additional \$410 million in Federal revenues would be generated without any increase in outlays;
- o Exports of up to 500,000 B/D would trigger expenditures of \$344 million on Title XI guarantees and perhaps \$34 million on acquisitions for the Ready Reserve Force of displaced tankers while generating \$534 million of additional revenues by 1990. An additional \$1.8 billion in revenues would be collected after 1990 without an increase in outlays; and
- o Removing export controls on North Slope crude would increase Federal revenues by \$4.6 billion between 1987 and 2000 (\$1.6 billion through 1990) while boosting outlays \$.4 billion before 1990.

2. State Impacts

The revenue impacts on Alaska and California would differ markedly due to differences in royalty interests and severance tax rates as well as larger changes in Alaskan crude oil prices.

With exports of 200,000 B/D, California and Alaska revenues would increase between 1987 and 2000 by about \$57 million and \$0.5 billion, respectively. Export levels under the 500,000 B/D

case would increase wellhead prices enough on the West Coast to boost California's revenues about \$524 million over the 1987 - 2000 time frame of the study, while State of Alaska revenues would increase by \$2.2 billion. With market-determined export levels, California revenues would increase \$1.6 billion and Alaska revenues about \$4.0 billion between 1987 and 2000. The increase in California's revenues amounts to approximately 43 percent of Alaska's \$4.0 in additional revenues. This large difference stems from higher petroleum taxes in Alaska. The latter has State royalty, severance and corporate income taxes on oil production, while California has royalty and corporate taxes.

TABLE IV (E) 1

ESTIMATED GOVERNMENT REVENUE EFFECTS
SELECTED NORTH SLOPE CRUDE OIL EXPORT OPTIONS
(Millions of Dollars)

	<u>Net Change</u>	<u>Alaska</u>	<u>California</u>	<u>Federal* Gov't.</u>
Unconstrained Exports				
1987-1990	3,408	1,330	441	1,637
1991-1995	4,032	1,510	538	1,885
1996-2000	2,728	1,116	555	1,057
All Years	10,168	3,956	1,633	4,579
500MBD Case				
1987-1990	1,099	514	51	534
1991-1995	1,838	731	113	993
1996-2000	2,102	938	360	804
All Years	5,039	2,183	524	2,331
200MBD Case				
1987-1990	284	137	14	134
1991-1995	520	211	29	281
1996-2000	296	152	14	129
All Years	1,100	500	57	543

ESTIMATED GOVERNMENT OUTLAYS
SELECTED NORTH SLOPE CRUDE OIL EXPORT OPTIONS
(Millions of dollars)

	<u>Total Outlays</u>	<u>Title XI</u>	<u>Defense Reserve Fleet</u>
Unconstrained Exports			
1987-1990	416	382	34
500MBD Case			
1987-1990	340	337	3
200MBD Case			
1987-1990	135	135	0

*Includes royalties from Federal Revenues from offshore and Naval Petroleum Reserves production. These royalties are normally presented as negative outlays in federal budget presentations.

F. MARITIME IMPACTS

1. General Description of the U.S. Tanker Fleet

The U.S.-flag tanker fleet is employed in four general areas: the ANS crude oil trade, the coastwide movement of refined petroleum products, the carriage of cargoes subject to the U.S. cargo preference laws and the carriage of a small amount of oil in the U.S. foreign trade. The movement of ANS oil constitutes, by far, the largest single source of employment for the U.S.-flag tanker fleet. Of the 10.7 million deadweight tons (DWT) of tankers active under the U.S. flag as of October 31, 1985, 6.4 million DWT, about 60 percent, were employed in the distribution of ANS crude. The employment of the U.S.-flag tanker fleet is summarized in the following table:

Table IV (F) 1

Status of U.S. Tanker Fleet
As of October 31, 1985

	<u>Millions</u> <u>of DWT</u>	
Operating	10.7	78.7%
ANS Trades	6.4	
Other Domestic	2.5	
MSC Charter*	0.7	
Foreign Trade**	1.1	
Lay-up	2.9	21.3%
CDS-Built	2.1	
Other	<u>0.8</u>	
Total	13.5	

* - Military Sealift Command: the Department of Defense charters privately-owned tanker tonnage for the movement of DOD cargoes.

** - Includes carriage of cargo subject to cargo preference laws.

2. ANS Trade

Due to geographic and vessel operating factors, the waterborne distribution system that moves ANS oil to the lower 48 States has three distinct components: shipments to the West Coast, shipments to Panama, and shipments from Panama to the Gulf and East Coasts and to Puerto Rico. The structural characteristics of the various

trades generally mean that it is physically impractical to use large tankers on the routes that require small tankers and economically impractical to use small tankers on the routes more suited to large tankers. As a consequence, several distinct markets exist and serve as the basis for the analysis of the impact of exports in the tanker fleet.

Two principal factors limit the types of tankers that can be employed in any individual trade: vessel size and environmental restrictions. Due to draft restrictions, the largest tankers (up to 265,000 DWT) can only be employed in the Alaska-Panama trade. Fully loaded tankers are limited to about 190,000 DWT in Los Angeles, and less than 100,000 DWT in San Francisco Bay. Larger vessels can enter these ports but only if the ships are lightened to reduce the draft or if the cargo is off-loaded onto smaller vessels. Either option increases the per unit cost of the shipment, making the use of oversize tankers less desirable economically than appropriate sized vessels. Environmental regulatory restrictions preclude the use of tankers greater than 125,000 DWT into Puget Sound.

Draft restrictions also apply to the continuation of the Alaska trade from Panama to the U.S. Gulf and East Coasts. Panama-Gulf/East Coast operations are generally limited to tankers below 100,000 DWT; however, one 125,000 DWT tanker is being shifted from the Valdez-West Coast trade to the Panama-Gulf Coast trade using the Louisiana Offshore Oil Port (LOOP).

Although the fleet currently serving the ANS trade is in a relative state of balance, there are certain events underway that will cause adjustments to this fleet and serve to reduce further the average operating costs in this trade. In 1986 and 1987, Exxon will receive delivery of two diesel-powered Very Large Crude Carriers (VLCCs) that are currently being built in a U.S. shipyard. In addition, if domestic tanker market conditions are favorable, it is anticipated that owners of additional tankers built with construction differential subsidy (CDS) will repay the unamortized portion of CDS in exchange for total removal of domestic trading restrictions under the provisions of the one-year payback rule issued by the Secretary of Transportation. This provision expires on June 5, 1986. For the purposes of this study, it is assumed that the owners of two CDS-built VLCCs will repay their subsidy in addition to the repayment of CDS on two VLCCs in July, 1985. This provides a mid-range estimate consistent with the mid-range estimates used elsewhere in this study. Further, given the existence of an adequate market in the domestic trades, it is anticipated that replacement construction will occur as the existing fleet ages. Because it is likely that this new tonnage will be diesel-powered, operating costs will be reduced significantly. The issue of ANS export is clearly critical to these fleet expansion and replacement plans.

3. Title XI Commitments

Under Title XI of the Merchant Marine Act of 1936, as amended in 1970, the Maritime Administration is authorized to grant mortgage insurance on ships built in U.S. shipyards. Currently, there are mortgage guarantees outstanding on 73 tankers totaling 5,999,000 DWT or roughly 44 percent of the U.S.-flag tanker fleet. The distribution of this fleet between the domestic and foreign trades (as implied by construction with CDS) is detailed in the following table:

Table IV (F) 2
OUTSTANDING TITLE XI MORTGAGE GUARANTEES
(As of September 30, 1985)

	<u>Number</u>	<u>Deadweight (000)</u>	<u>Mortgage (Millions of Dollars)</u>
Tankers built with CDS	27	2,631	\$415
Tankers w/o CDS			
ANS Trade	26	2,728	732
Other Trades	<u>20</u>	<u>640</u>	<u>449</u>
	46	3,368	\$1,181
<u>Total</u>	73	5,999	\$1,596

4. ANS Export Impact

The primary impact of any export of ANS oil will be to reduce the movement of ANS crude to the lower 48 States. This will immediately reduce the primary source of employment for the U.S.-flag tanker fleet creating turbulence in the entire domestic tanker market in addition to that portion serving the ANS trade. As mentioned previously, the alternate forms of employment for the U.S. tanker fleet are limited to the dwindling domestic coastwide product movements and the small level of U.S.-flag vessel participation in the foreign trades. Of course, it is not possible to forecast the precise economic effects of turbulence in the tanker trades.

Because there is little or no alternative employment at any feasible freight rates for the tanker tonnage that would be laid-up as the result of the export of ANS crude, the net impact will be to cause lay-up and eventual scrapping of U.S.-flag tanker tonnage. The export of ANS crude would have an uneven impact on the U.S.-flag tanker fleet as a consequence of the existing market structure. The ships owned by oil companies or under long-term time charter to the oil companies represent long-term contractual commitments and, as a

result, these ships are least likely to be idled except in the high export cases where the ship would be laid-up and the charterer would be faced with paying charter costs on unused tonnage. The ships that are most vulnerable to displacement are those owned by independent tanker operators and on short-term charters. These operators are highly likely to default on their Title XI guaranteed loans. Further, because the ANS trade is not isolated from the other domestic trades, there will be a spillover impact into the remainder of the U.S. tanker trades, making tankers employed in these other trades equally vulnerable to lay-up.

This loss of tonnage will have several consequences for both the public and private sectors. The losses to the Federal sector include outlays to pay off Federally guaranteed ship mortgages, loss of tax revenues, and reduced national defense readiness. The losses to the private sector include non-government guaranteed mortgage defaults, loss of seafaring employment, and loss of revenue by the U.S. ship operating and shipbuilding and repair industries.

The direct impact on the component of the maritime industry currently employed in the ANS trade has been estimated for each level of the export options. Direct impacts have been calculated in terms of (1) the number of tankers idled by the option, (2) the total deadweight tonnage of these tankers, (3) the total number of seafaring jobs involved, (4) the amount of Federally guaranteed loans outstanding on these vessels, and (5) an estimate of the unsecured private debt (no Federal guarantees) on the vessels. As can be seen from Table IV (F) 3, export of ANS crude at an unconstrained level would lay-up 32 tankers totaling 4.3 million DWT, exposing approximately \$382 million of Federally guaranteed loans to default. Of this figure, about \$191 million would be subject to nearly immediate default due to the nature of the charter commitments and lack of employment prospects for the affected tankers. The estimates in Table IV (F) 3 are based upon the mid-range forecasts of ANS production used in this study. If ANS production turns out to be higher than these forecasts, there would be less impact to the fleet under the "no export" scenarios than is shown in this table, but there would be little change in the results shown for the various export scenarios. The "no export" scenario does include the impact of the All American Pipeline on domestic tanker requirements.

Even if a portion of the export trade were reserved for U.S.-flag vessels, there would be no reduction in the Title XI losses incurred by the domestic tanker fleet. This result occurs because the exports would probably be carried on the existing tankers that were built with construction subsidy for the U.S. foreign trade and that have not repaid CDS to gain eligibility for the domestic trades. Due to lower capital costs, these tankers would be able to carry the oil at lower freight rates. At best, the effect of reserving a portion of the export trade for U.S.-flag tankers might be the prevention of Title XI defaults on otherwise idle foreign trade tonnage.

TABLE IV (F) 3

Impact of 200 Grade Oil Exports on the United States Flag Tanker Fleet
 Losses to the Federal Government and Shippers
 Full Title II Exposure
 Oil Market Date, 1978 Dollars

Export Scenario	Change Due To Exports					Total Change Due To Lower Production and Redistribution					Total Change Due To Exports Combined With Lower Production and Redistribution				
	No. of Vessels	Pol. Title II at Risk of Default		Estimated Shipper's Exposure	No. of Shippers	No. of Vessels	Pol. Title II at Risk of Default		Estimated Shipper's Exposure	No. of Shippers	No. of Vessels	Pol. Title II at Risk of Default		Estimated Shipper's Exposure	No. of Shippers
		B/D					B/D					B/D			
No Exports															
1987	0	0	00	00	0	0	0	00	00	0	0	0	00	00	0
1990	0	0	00	00	0	0	039,300	001,099,216	09,043,011	306	0	039,300	001,099,216	09,043,011	306
Total, No Exports	0	0	00	00	0	0	039,300	001,099,216	09,043,011	306	0	039,300	001,099,216	09,043,011	306
20,000 B/D															
1987	2	132,000	016,376,000	01,300,000	130	0	0	00	00	0	2	132,000	016,376,000	01,300,000	130
1990	1	190,000	043,013,032	07,100,000	63	0	039,300	001,099,216	09,043,011	306	1	039,300	043,013,040	04,077,000	633
Total, 20,000 B/D	3	322,000	059,389,032	08,400,000	193	0	039,300	001,099,216	09,043,011	306	1	040,300	044,011,040	040,307,000	306
100,000 B/D															
1987	4	330,000	040,004,671	04,330,330	330	0	0	00	00	0	4	330,000	040,004,671	04,330,330	330
1990	2	320,000	033,117,630	034,000,000	170	0	039,300	001,099,216	09,043,011	306	0	040,300	043,011,040	034,720,300	303
Total, 100,000 B/D	6	650,000	073,122,301	077,330,330	500	0	039,300	001,099,216	09,043,011	306	0	1,300,000	043,216,317	041,090,000	771
200,000 B/D															
1987	7	643,700	070,927,002	030,000,700	644	0	0	00	00	0	7	643,700	070,927,002	030,000,700	644
1990	2	300,000	026,176,237	037,300,000	133	0	039,300	001,099,216	09,043,011	306	0	1,043,000	0137,073,033	047,197,033	300
Total, 200,000 B/D	9	943,700	097,103,239	067,300,700	777	0	039,300	001,099,216	09,043,011	306	0	1,703,000	076,003,330	040,003,707	944
300,000 B/D															
1987	9	1,100,000	0171,030,003	033,226,000	377	0	0	00	00	0	9	1,100,000	0171,030,003	033,226,000	377
1990	13	1,007,000	0163,030,003	0232,000,700	672	0	039,300	001,099,216	09,043,011	306	19	2,047,000	0274,157,221	0242,930,042	1,030
Total, 300,000 B/D	22	2,097,000	0334,060,006	0564,226,700	1,049	0	039,300	001,099,216	09,043,011	306	20	3,170,000	0410,372,246	0777,671,002	1,033
Unconstrained Exports															
1987	9	1,100,000	0171,030,003	033,226,000	377	0	0	00	00	0	9	1,100,000	0171,030,003	033,226,000	377
1990	23	3,203,000	0210,131,733	0303,170,303	1,033	0	039,300	001,099,216	09,043,011	306	29	3,043,000	0274,030,730	0303,077,330	1,032
Total, Unconstrained Exports	32	4,303,000	0381,161,736	0636,396,303	1,410	0	039,300	001,099,216	09,043,011	306	20	4,093,000	0443,300,970	0700,300,316	2,069

In addition, the private sector, including both oil companies owning tankers and private tanker owners would be exposed to an additional potential default of \$540 million in the unconstrained export case. To the extent this amount is written off against income, it will cause a loss of Federal income tax receipts. To the extent this idled capital cannot be written off against taxes, the loss will either be passed on to the consumer in the form of higher prices or will result in a loss to the owners.

5. Impact on Shipbuilding and Ship Repair Industries

The U.S. shipbuilding industry will also be affected by the exports of ANS oil. There are two principal components to this impact: shipbuilding and ship repair. It is clear that if the ANS market is considered to be an economically viable source of employment by the vessel operators, there will, by the year 2000, be construction of new tonnage to replace a portion of the fleet currently in service. These vessels would be built in the United States.

Table IV (F) 4 compares the tanker tonnage in the ANS trade fleet that is less than 20 years of age to the requirement for that tonnage, based upon the mid-range forecast of ANS production that is used in this study.

Table IV (F) 4

PROFILE OF TANKER FLEET
OPERATING IN ANS TRADE WITH NO EXPORTS
(Deadweight Tons in Thousands)

<u>Year</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Tankers in the ANS Trade Less than 20 Years Old	6,116	4,251	858
Total DWT Required in Ans Trade	5,961	3,992	3,646
Shortfall of Tankers Less than 20 Years Old	155	259	-2,788

Through the year 1995 and under the export ban, the requirement for tankers is remarkably close to the capacity available that is less than 20 years of age. However, between the years 1995 and 2000, it appears that block obsolescence occurs and that by the year 2000, over 2.7 million deadweight tons serving in the ANS trade will be over 20 years of age. The shortfall would be greater and would occur earlier if the ANS production were to be higher than the mid-range forecast. Assuming that the employment prospects for the trade are stable, it can be expected that the overage capacity will

be replaced with new tonnage. Assuming that this 2.7 million DWT is replaced with tankers similar to EXXON's most recent new buildings (209,000 DWT and 58,000 DWT) the result would be the construction of 22 tankers. At a 1984 cost of \$125 million escalated to a 1985 base of \$128.3 million for the 209,000 DWT ships and at a 1981 cost of \$85 million escalated to a 1985 base of \$94.2 million for the 58,000 DWT ships, this construction would represent about \$2.41 billion in U.S. shipyard revenues in 1985 dollars. Export of ANS crude would reduce this ship construction activity by up to \$1.4 billion in the high export case as shown in Table IV (F) 5.

Table IV (F) 5

SHIP REPLACEMENT CONSTRUCTION FOR
ANS TRADE BY YEAR 2000
(Millions of 1985 Dollars)

<u>Export Level</u>	<u>Replacement Construction</u>	<u>Loss of Replacement Construction Due to Exports</u>
No Exports	\$2,413.0	-0-
50,000 B/D	2,096.0	\$ 317.0
100,000 B/D	1,874.0	539.0
200,000 B/D	1,301.0	1,112.0
500,000 B/D	984.0	1,429.0
Unconstrained Exports	984.0	1,429.0

In addition to the loss of ship construction revenues, the export of ANS oil would cause an annual loss to U.S. shipyards as a consequence of reduced revenues from the maintenance and repair of the ships that would otherwise operate in the ANS trade. Table IV (F) 6 details the cumulative impact for the various export scenarios.

Table IV (F) 6

CUMULATIVE LOSS OF MAINTENANCE AND REPAIR
REVENUE TO U.S. SHIPYARDS (1987-2000)
RESULTING FROM EXPORT OF ANS CRUDE
(Millions of 1985 Dollars)

<u>Export Level</u>	<u>Maintenance and Repair</u>
50,000 B/D	\$ 39.1
100,000 B/D	72.6
200,000 B/D	118.1
500,000 B/D	286.6
Unconstrained Exports	392.7

G. TRADE IMPACTS

The analysis of trade impacts will be evaluated and presented from two perspectives:

- o Consideration of changed petroleum product flows resulting from allowing ANS crude exports; and
- o An analysis of crude replacement costs assuming no net changes in petroleum product flows resulting from ANS crude exports.

1. Changed Product Flows

The analysis indicates that lifting the ban on Alaskan exports results in a positive trade balance of approximately \$3.7 billion in 1985 dollars over the 1987 - 2000 period. This conclusion is based on the projection that crude oil exports will not be offset on a barrel for barrel basis by imports. Specifically, Table IV (G) 1 shows that, under unconstrained conditions, exports of ANS crude and the resultant changes in West Coast refinery product flows will result in smaller crude oil import levels. This conclusion is reached because:

- Lifting the ban provides economic incentives for producers to export ANS crude (at \$26.03 per barrel) rather than export residual fuel oil at substantially lower prices - (\$20.91 per barrel). At present, residual fuel oil exports are permitted while crude exports are prohibited.
- Under this approach, approximately 150,000 B/D of West Coast residual fuel oil exports would end. This residual oil, when combined with imports of Indonesian light crude, would be processed and would yield 150,000 B/D of light products (e.g., motor gasoline) for the West Coast market.
- Lifting the ban would result in higher domestic residual fuel oil prices that, in turn, would reduce domestic demand by about 60 MB/D in 1995.

The analysis concludes that in 1995, the United States would export 520,000 B/D of ANS crude and import only 310,000 B/D to offset the exports. The 210,000 B/D of crude oil is offset by: (1) a reduced economic incentive to export residual fuel oil because of its low price - 150,000 B/D; (2) the import of light Indonesian crude to get a refinery crude stream that yields desirable products for the West Coast market, and (3) a reduction in demand for residual fuel oil in California of 60,000 B/D, since lifting the ban raises residual fuel prices and results in reduced demand.

TABLE IV (G) 1

TRADE FLOW BASED
ON CHANGED PRODUCT FLOWS
(1985 \$/Bbl and MB/D)

Unconstrained Exports

ANS Crude 520 MB/D at

25.47 FOB Gulf Plus 1.29 Freight
to United States less 0.73 Freight to Japan
\$26.03 FOB Alaska

\$26.03 X 520,000 B/D X 365 Days = \$13,535,600 Per Day or
\$4.94 Billion Per Year

Imports

Gulf Coast 190,000 B/D at

\$25.47 FOB Persian Gulf Plus
2.04 Freight Yield
27.51 CIF Gulf

\$5,226,900 Per Day or
\$1,908 Billion Per Year

West Coast 120,000 B/D at

\$30.31 CIF for Indonesian
crude oil

\$3,637,200 Per Day or
\$1,328 Billion Per Year

Residual Fuel Oil

West Coast 150,000 B/D at

\$20.91 FOB California For
Residual Fuel Oil No Longer
Exported Because Crude Yields
a Higher Price
(\$26.03 versus \$20.91/Bbl)

\$3,136,500 Per Day or
\$1,145 Billion Per Year

Trade Balance (Unconstrained Exports)

520,000 B/D	=	\$4,940 Billion Per Year
460,000 B/D	=	\$4,381 Billion Per Year
60,000 Net Exports		\$ 559 Million Surplus

Net Savings on Imports

60,000 B/D of Oil Imports no longer needed because
lifting the ban has raised residual fuel oil prices in
California and has reduced demand for resid by 60,000 B/D.

Table IV (G) 2

**PRICING CONCEPT FOR ANS EXPORTS
AND CRUDE OIL REPLACEMENT IMPORTS
(1985 dollars per barrel)**

	<u>1985</u>	<u>1/86</u>	<u>1/86</u>	<u>1/86</u>
<u>Arab Light to the U.S.</u>				
FOB	25.90	25.00	20.00	18.00
Freight	<u>1.10</u>	<u>1.10</u>	<u>1.10</u>	<u>1.10</u>
Delivered on the Gulf Coast	27.10	26.10	21.10	19.10
 <u>Arab Light to Japan</u>				
FOB	25.90	25.00	20.00	18.00
Freight	<u>0.60</u>	<u>0.60</u>	<u>0.60</u>	<u>0.60</u>
CIF	25.50	25.60	20.60	18.60
Less Quality Adjustment for Alaskan Crude	<u>0.20</u>	<u>0.20</u>	<u>0.20</u>	<u>0.20</u>
CIF Japan Adjusted for Quality of Alaskan North Slope Crude	26.30	25.40	20.40	18.40
 Less Freight from Alaska to Japan (in foreign tanker) Yields	<u>0.40</u>	<u>0.40</u>	<u>0.40</u>	<u>0.40</u>
FOB	25.90	25.00	20.00	18.00
 NOTE:				
Price U.S. Pays for Arab Light	27.00	26.10	21.10	19.10
 Price U.S. Receives to Export ANS FOB Valdez	<u>25.90</u>	<u>25.00</u>	<u>20.00</u>	<u>18.00</u>
Theoretical Difference	1.10	1.10	1.10	1.10

NOTES:

1. Assumes hypothetical FOB Saudi Light prices. Current FOB, price of 1/14/86 is estimated at \$20-22/BBL given market uncertainty.
2. Freight rates are derived from MARAD data.
3. Ocean distance from Persian Gulf to Japan is 6,600 nautical miles and from Alaska to Japan is 3,300 miles.

2. Crude Oil Replacement Scenario

This alternate trade impact scenario analyzes the one-for-one replacement costs of a barrel of ANS crude with foreign oils. It makes the following observations regarding the West Coast industry.

- PAD V refiners may choose to continue to export substantial quantities of residual fuel oil because they have covered their profit margins on high value added co-products such as gasoline and jet fuel and need to unload the residual fuel.
- Rather than replacing ANS crude in PAD V with Indonesian light, low sulfur crude, the refiners may opt for heavy sour crudes to feed their existing refinery configuration. It may be relatively cheaper to purchase heavy crudes than Indonesian light.

In their response to the DOC Federal Register Notice the American Independent Refiners Association notes their strong opposition to lifting the ANS crude oil ban because their constituents wish to continue purchasing ANS crude.

"If substantial volumes of Alaskan crude oil were exported, crude oil costs on the West Coast, where much of the Alaskan crude oil is refined, would, in the long run, rise as much as several dollars per barrel . . . Market conditions probably would make it impossible, however, for independent refiners to pass on to consumers all of the additional crude oil costs in the form of product price increases. Because independent refiners already are struggling with a maze of financial problems, the need to absorb even a small portion of the crude oil price increase could force some additional refiners out of business."

On the other hand, West Coast refiners could maintain access to ANS crude even if the export ban were to be lifted. This would be possible if West Coast refiners bid-up the price of ANS crude to a level where it would be more profitable for the producers to sell ANS crude on the West Coast rather than export it to the Pacific Rim market. Assuming that by the 1990s, Valdez-West Coast and Valdez-Pacific Rim shipping rates are nearly equal, the result would be that the West Coast refiners could pay higher prices for ANS crude and the "West Coast Discount" would be eliminated.

3. Trade Analysis

The analysis of the crude replacement cost scenario begins with the general premise that ANS crude oil exports will be replaced on a barrel-for-barrel basis by crude imports. If U.S. ships do not transport any ANS crude exports to foreign markets, this scenario projects an overall trade deficit of approximately \$3.4 billion

between 1987 and 2000. This is based on the fact that the United States will export crude on an FOB (i.e., free on board) Valdez, Alaska basis and replace it on a CIF (i.e., cost of insurance and freight) basis and on foreign tankers. If, however, U.S. ships obtain half of the projected export business, the analysis indicates that the above noted trade deficit could be almost eliminated (see Table IV (G) 4. The analysis is set forth below:

- The data in Table IV (G) 2 illustrates the primary calculation of the relative pricing of ANS exports and replacement crude imports. The analysis assumes that the United States and Japan will pay the same FOB price for Arabian Light Crude.
- The delivered U.S. Gulf Coast crude price is equal to the FOB Arabian Gulf price plus transportation. The comparable Japanese CIF crude price involves the same elements but is approximately \$0.50 per barrel less expensive given the shorter distance between Saudi Arabia and Japan compared to Arabian Gulf and the U.S. Gulf Coast distance (i.e., 6,600 nautical miles versus 11,000 nautical miles).
- Adjusting for the quality differential between ANS crude and Arabian light (currently \$0.20 per barrel) and the cost of freight between Alaska and Japan (in a foreign tanker) yields the FOB Alaska price. Table IV (F) 2 shows that under various hypothetical crude oil price scenarios, the United States would pay approximately \$1.10 per barrel more in transportation charges to ship the imported crude to the United States on foreign ships.
- This \$1.10 per barrel represents a small balance of payments deficit that stems from exporting ANS crude on an FOB basis and paying the transportation charge for the replacement crude oil import.

Table IV (G) 3 provides a possible forecast of U.S. crude oil replacement costs as well as Alaskan oil export prices.

- The estimated \$1.10 per barrel figure for the United States Gulf Coast could grow to \$1.78 by 2000.
- The \$1.10 per barrel estimate would be reduced if the United States could provide part of the tankers for the ANS exports and substantially eliminated if the United States supplied half the shipping. (Note: This assumes that foreign purchasers would pay the higher freight rates for the U.S. flag tankers and not demand any offsetting adjustments of the FOB sales prices.)

Table IV (G) 3

PRICING OF U.S. OIL IMPORTS AND EXPORTS
(\$1985/BBL)

	<u>1985</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>Arab Light to the U.S.</u>					
FOB	25.90	23.13	22.22	25.46	30.33
Freight	<u>1.10</u>	<u>1.37</u>	<u>1.78</u>	<u>2.04</u>	<u>2.17</u>
Delivered on the Gulf Coast	27.00	24.50	24.00	27.50	32.50
 <u>Arab Light to Japan</u>					
FOB	25.90	23.13	22.22	25.46	30.33
Freight	<u>0.60</u>	<u>0.82</u>	<u>1.10</u>	<u>1.29</u>	<u>1.38</u>
CIF	26.50	23.95	23.32	26.75	31.71
Less Quality Adjustment for Alaskan Crude	<u>0.20</u>	<u>0.20</u>	<u>0.20</u>	<u>0.20</u>	<u>0.20</u>
CIF Japan Adjusted for Quality of Alaskan North Slope Crude	26.30	23.75	23.12	26.55	31.51
Less Freight from Alaska to Japan (in foreign tanker) Yields	<u>0.40</u>	<u>0.47</u>	<u>0.63</u>	<u>0.73</u>	<u>0.79</u>
FOB ALASKA	25.90	23.28	22.49	25.82	30.72
NOTE:					
Price U.S. Pays for Arab Light	27.00	24.50	24.00	27.50	32.50
Price U.S. Receives to Export ANS FOB Valdez	<u>25.90</u>	<u>23.28</u>	<u>22.49</u>	<u>25.82</u>	<u>30.72</u>
Theoretical Difference	1.10	1.22	1.51	1.68	1.78

NOTES:

1. FOB Saudi Light Price defined as U.S. Imported Refiner's Crude Oil acquisition cost less freight from Persian Gulf to Gulf Coast. It is assumed that Japan pays an identical FOB price for Arab Light.
2. Freight rates are derived from MARAD data.
3. Ocean distance from Persian Gulf to Japan is 6,600 nautical miles and from Alaska to Japan is 3,300 miles.

TABLE IV (G) 4
POTENTIAL EARNINGS FROM
ALASKAN OIL EXPORTS
(\$1985 Million)

<u>Case/Year</u> <u>FOB Valdez</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
50 M B/D	425	410	471	561
100 M B/D	850	821	942	1,121
200 M B/D	1,699	1,642	1,885	2,243
500 M B/D	2,549	4,104	4,712	4,037-360
Unconstrained Exports Scenario	2,549	7,142	4,995	4,037-360

CIF Pacific Rim
Based 50% U.S. Shipping

50 M B/D	440	426	489	580
100 M B/D	879	853	979	1,159
200 M B/D	1,757	1,707	1,958	2,319
500 M B/D	2,636	4,266	4,895	4,174
Unconstrained Exports Scenario	2,636	7,425	5,188	4,174

Notes:

1. Based upon FOB export prices in Table 3: 1987- \$23.28; 1990- \$22.49; 1995- \$25.82; and 2000- \$30.72.
2. Freight derived from Marad is a weighted 50/50 on U.S. and foreign tanker rates: 1987- \$0.79; 1990- \$0.89; 1995- \$1.00; and 2000- \$1.04
3. Exports are constrained at 360 MB/D in year 2000 high export and 500 MB/D cases
4. Unconstrained exports rise linearly from 300 MB/D in 1987 to 870 MB/D in 1990, and then decline (linearly) to 530 MB/D in 1995 and to 360 MB/D in 2000.
5. The CIF export earnings assume that foreign purchases would pay higher prices that reflect the use of the American ships to move 50 percent of the oil.

Note:

FOB exports - Unconstrained Exports Scenario, 1987 - 2000, \$70.8 billion.

4. Crude Oil Imports

If the export ban is lifted, large volumes of ANS exports could require increased imports of crude oil or refined products to the United States from the Persian Gulf by 1990 (see Table IV (G) 6). This projection is based on several factors. First, there are physical limitations on the availability of large new crude export supplies from Indonesia and Malaysia. Second, Mexico shows no signs of modifying its current overall export limitation of 1.5 million B/D with no more than 50 percent of total exports flowing to any particular country. Third, North Sea oil output is expected to peak in the early 1990s.

In short, the Persian Gulf contains the largest available reserve bases and has extremely low oil production relative to its potential.

5. Conclusion

The changed product flows and crude oil replacement scenarios represent two analytical approaches to measuring the trade impact of lifting the ANS crude export ban. While dollar volume difference between the two is large -- \$3.7 billion surplus versus \$3.4 billion deficit over the 1987-2000 period -- both scenarios will be affected by a number of developments. For example, net refinery processing gains from West Coast refineries could fall below the results projected in the product flows scenario.

On the other hand, U.S. ships could be used to transport 50 percent or more of the ANS crude exports. Moreover, world oil prices could remain depressed and OPEC producers seeking to maintain access to the U.S. market may price their crude below United States oil prices. The primary observation is that each of these factors could impact on the two above scenarios and produce a different trade impact.

TABLE IV (G) 5

PAYMENTS FOR OIL IMPORTS
TO REPLACE ANS CRUDE
(\$1985/BBL)

	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Arab Light FOB Ras Tanura	23.13	22.22	25.46	30.33
Plus Freight to U.S. Gulf Coast	<u>1.37</u>	<u>1.78</u>	<u>2.04</u>	<u>2.17</u>
CIF Price	24.50	24.00	27.50	32.50
Less Quality Adjustment for ANS Crude	<u>-0.20</u>	<u>-0.20</u>	<u>-0.20</u>	<u>-0.20</u>
Yield Gulf Coast Crude Replacement Price for ANS Crude	24.30	23.80	27.30	32.30
<u>Total Import Payments</u> <u>(\$Million)</u>				
50 M B/D	\$ 443	434	498	589
100 M B/D	\$ 887	869	996	1,179
200 M B/D	\$1,774	1,737	1,993	2,358
500 M B/D	\$2,661	4,344	4,982	4,244
Unconstrained Exports	\$2,661	7,558	5,281	4,244

Notes:

- (1) Arab Light FOB derived from midpoint estimates of world oil prices (see assumptions) netted back to Saudi Arabia to reflect transportation charges.
- (2) Unconstrained and 500 MB/D scenarios limited to 360 MB/D in 2000.
- (3) Total Import Payments to Replace ANS Crude, 1987 - 2000, \$74.2 billion (Unconstrained Exports.)

TABLE IV (G) 6
POSSIBLE IMPORT SUPPLY
REPLACEMENT SOURCES
(M B/D)

<u>Case/Year</u>	<u>Supply Source</u>	<u>1985</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
50 M B/D	Asia	0	0	0	0	0
	Western Hemisphere	0	25	25	25	25
	Persian Gulf	0	25	25	25	25
		<u>0</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>
100 M B/D	Asia	0	0	0	0	0
	Western Hemisphere	0	50	50	50	50
	Persian Gulf	0	50	50	50	50
		<u>0</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
200 M B/D	Asia	0	40	40	40	40
	Western Hemisphere	0	80	80	60	60
	Persian Gulf	0	80	80	100	100
		<u>0</u>	<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>
500 M B/D	Asia	0	40	120	120	100
	Western Hemisphere	0	120	100	100	100
	Persian Gulf	0	140	280	310	160
		<u>0</u>	<u>300</u>	<u>500</u>	<u>530</u>	<u>360</u>
<u>Unconstrained Exports</u>	Asia	0	40	160	120	100
	Western Hemisphere	0	120	100	100	100
	Persian Gulf	0	140	590	310	160
		<u>0</u>	<u>300</u>	<u>850</u>	<u>530</u>	<u>360</u>

H. EMPLOYMENT IMPACTS

1. Introduction

Allowing exports of Alaska North Slope (ANS) crude oil is likely to cause U.S. maritime employment to decline substantially. ANS crude oil formerly carried between domestic ports on U.S. flag tankers under the Jones Act would probably be carried to foreign ports on foreign flag tankers. The wellhead price increase in ANS crude resulting from exports will provide more funds for new exploration and development. This would lead to a small increase in Alaskan oil and gas extraction employment. Oil and gas extraction employment in California should also rise due to crude oil and natural gas wellhead price increases. Californian oil refinery employment, however, should not be affected.

2. Seafaring

The estimated number of seafarers displaced due to ANS exports are reported in Table IV (F) 3 above.

- o Displacements range from 198 seafarers or 5 percent of January 1985 seafaring employment, with exports limited to 50,000 barrels per day, to 2,013 seafarers or 52 percent with unlimited exports.
- o Displaced seafarers would have difficulty finding work in other types of domestic shipping since employment opportunities in the U.S. shipping industry at large are poor.

3. Shipbuilding and Repairing

U.S. employment in shipbuilding and repair also would be affected if the ban is lifted, since ANS oil exports would be transported on foreign flag tankers. A large portion of shipbuilding and repair facilities, particularly on the West Coast are related to the ANS oil trade. Lifting the export ban would severely affect on employment in shipbuilding and ship repair. Specific employment effects for these industries are not presented due to insufficient data.

4. Alaskan Oil and Gas Extraction

Alaskan employment increases in oil and gas extraction will be generated as a result of expanded ANS crude oil production if the export ban is lifted. These effects are estimated using the procedure discussed in Technical Appendix C and the estimated ANS crude oil supply increases presented in Table IV (B) 3 above.

- o Lifting the ban totally is expected to increase ANS production by 5-15 MB/D by the year 2000.
- o As shown in Table IV (H) 1, eliminating the ANS export ban completely is estimated to increase Alaskan oil and gas extraction employment by 42 workers or less than one percent by the year 2000.
- o Partial removal of the ban should result in smaller employment increases.

5. Californian Oil and Gas Extraction

Crude oil production in California would also increase if the export ban is lifted. This would result from eliminating the "West Coast Discount" for ANS crude and raising wellhead prices. An increase of 12-24 MB/D by 2000 would also boost employment.

Estimated effects of lifting the ANS oil export ban on Californian oil and gas extraction employment are presented in Table IV (H) 2. The estimation method is the same as that used to obtain the estimated Alaskan employment effects shown in Table IV (H) 1.

- o Allowing unlimited ANS oil exports is estimated to increase Californian oil and gas extraction employment by 664 workers or 1.4 percent of the this workforce by the year 2000 due to increased Californian crude oil and natural gas prices.
- o Estimated Californian employment increases are larger both in absolute terms and as a percentage of the total workforce than Alaskan employment increases, although increases may occur more slowly in California.

6. Californian Refiners

Allowing exports of ANS crude should not produce large changes in Californian oil refining employment. Californian refiners are expected to respond to higher prices for ANS and Californian crude by using more light imported crude from Indonesia and elsewhere. This should lower Californian refiner costs by making the mix of light and heavy crude more suited to existing refinery technology. To the extent that aggregate refinery production remains unchanged in California, refinery employment should not change appreciably.

TABLE IV (H) 1

ESTIMATED INCREASES IN ALASKAN
OIL AND GAS EXTRACTION EMPLOYMENT
DUE TO LIFTING THE ANS OIL EXPORT BAN

	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>Unconstrained ANS Oil Exports</u>			
Number of workers	17	39	42
Percent of total	0.24	0.59	0.71
<u>500,000 Barrel Per Day ANS Oil Export Limit</u>			
Number of workers	7	21	42
Percent of total	0.10	0.32	0.71
<u>200,000 Barrel Per Day ANS Oil Export Limit</u>			
Number of workers	2	7	4
Percent of total	0.03	0.11	0.07
<u>100,000 Barrel Per Day ANS Oil Export Limit</u>			
Number of workers	1	3	2
Percent of total	0.01	0.05	0.03
<u>50,000 Barrel Per Day ANS Oil Export Limit</u>			
Number of workers	1	2	1
Percent of total	0.01	0.03	0.02

Source: U.S. Department of Labor (ILAB) estimates based on estimated ANS crude oil supply responses given in Table IV (A). 3 estimated employment with no ANS oil exports reported in Technical Appendix C, and the assumption that employment is proportional to crude oil production.

TABLE IV (H) 2
PROJECTED CALIFORNIAN CRUDE OIL PRODUCTION
AND EMPLOYMENT IN OIL AND GAS EXTRACTION
WITH THE EXPORT BAN IN PLACE

	<u>Production</u>	<u>Employment</u>
	<u>(millions of b/d)</u>	<u>(number of workers)</u>
1990	1.43	52,731
1995	1.32	48,675
2000	1.32	48,675

7. Gulf and East Coast Refiners

ANS crude exports should have a relatively small effect on Gulf and East Coast refinery production and employment. In contrast to West Coast refiners, Gulf and East Coast refiners are already using a mix of heavy and light crudes well-suited to existing plants. Heavy crude is not overly abundant in Gulf and East Coast markets and foreign crude supplies already account for a large portion of crude refined in Gulf and East Coast markets. Therefore, ANS oil exports should have little effect on Gulf and East Coast refiners.

8. Other Alaskan and Californian Industries

Widely diffused employment gains may also occur in Alaskan and Californian industries other than shipping and petroleum.

- o As noted in Sections II and III, an increase in ANS crude oil production should lead to indirect employment increases in many other sectors of the Alaskan economy. Additional oil industry workers will spend their income on a variety of goods and services such as housing and food. These expenditures result in small employment gains throughout the economy.

IV-53

- o In addition, allowing ANS oil exports should increase the wellhead prices of ANS and Californian crude, causing profits of those crude oil producers to increase. To the extent that these profits are spent on capital goods such as machinery and construction, there may be an increase in Alaskan and Californian employment associated with the increase in investment spending.
- o If West Coast product prices rise in the near-term, due to ANS exports, this would lead to employment decreases. On the other hand, lower refining costs combined with long-term product price declines may spur new employment.

However, these indirect employment changes are very difficult to estimate. Therefore, estimated indirect employment effects in Alaska and California are not presented here.

TABLE IV (H) 3

ESTIMATED INCREASES IN CALIFORNIAN
OIL AND GAS EXTRACTION EMPLOYMENT
DUE TO LIFTING THE ANS OIL EXPORT BAN

	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>Unconstrained ANS Oil Exports</u>			
Number of workers	20	490	664
Percent of total	0.04	1.01	1.36
<u>500,000 Barrel Per Day ANS Oil Export Limit</u>			
Number of workers	24	111	664
Percent of total	0.05	0.23	1.36
<u>200,000 Barrel per Day ANS Oil Export Limit</u>			
Number of workers	6	28	(a)
Percent of total	0.01	0.06	
<u>100,000 Barrel Per Day ANS Oil Export Limit</u>			
Number of workers	(a)	16	(a)
Percent of total		0.03	
<u>50,000 Barrel Per Day ANS Oil Export Limit</u>			
Number of workers	(a)	6	(a)
Percent of total		0.01	

Note:

(a) The estimated employment increase is negligible.

Source: U.S. Department of Labor (ILAB) estimates based on estimated Californian crude oil supply responses given in Table IV (A). 3 estimated employment with no ANS oil exports reported in Table IV (G). 2, and the assumption that employment is proportional to crude oil production.

I. FOREIGN POLICY IMPACTS

1. Introduction

The statutory ban on crude oil exports was originally imposed after the oil shocks of the 1970s to assure a stockpile of reasonably priced supplies for domestic consumption, to reduce U.S. dependence on potentially more expensive and less secure foreign sources of oil, and to moderate the impact of global price rises that occur even when U.S. supplies are not directly disrupted. The Administration has strongly urged the International Energy Agency to support an open trading system in which market forces determine prices and the movement of goods internationally. The International Energy Agency has developed a consensus that reliance on market forces is an effective means to promote stability and energy security. Lifting the ban on ANS crude oil exports would be consistent with these objectives.

Set forth below is a multilateral and bilateral foreign policy assessment of potential impacts of lifting the ban on ANS crude exports. It should be noted that interested parties who responded to the Federal Register Notice are split on the foreign policy and national security impacts of lifting the ban. A synopsis of their views is included at the end of this section. For this analysis, we assume legislation will allow, but not require, exports of ANS crude oil.

2. International Energy Agency (IEA)

In the communique of the International Energy Agency (IEA) Ministerial held July 9, 1985, the Ministers agreed that one requirement for energy policy is flexible, open and resilient markets within which the different fuels can compete vigorously and find their levels of demand and supply through operation of the price mechanism. Another requirement is that governments also carry out policies that accomplish their objectives and at the same time supplement an effective market system.

Lifting the export ban on Alaskan North Slope crude oil is consistent with the objectives of the IEA as it would allow market forces to determine the destination of the product, thus creating a more efficient distribution system. In its annual review of U.S. energy policies and programs, the IEA recommended that the United States pursue action aimed at lifting the ban on exports of crude oil. Removing the ban could enhance global energy security through increased energy security for Pacific Rim countries.

3. Relations with Japan

Japan would likely be the major foreign customer for Alaskan North Slope oil, if its export were permitted. Japan, currently importing more than 4 million barrels-per-day, has long been interested in

Alaskan oil. At the highest levels, the Government of Japan is aware of the value of ANS crude as a secure energy source.

While Japan has taken significant steps to diversify its sources of energy since the OPEC oil crisis, it is still heavily dependent upon oil from the Middle East. In 1986, more than half of Japan's oil imports are expected to flow through the Strait of Hormuz. Recent damage to privately owned Japanese petroleum facilities in the Middle East and the evacuation of Japanese engineers assigned to those facilities has served as a reminder of the fragile status of oil imports from that area. Although it is unlikely that the Japanese would completely replace any one supplier with imports of Alaskan North Slope oil, ANS oil could contribute to Japan's goal of supply diversification and enhance U.S./Japanese security interests in the area.

The extent of Japanese participation in purchases of ANS oil would be based on commercial factors. The Japanese Government estimates that initially purchases would amount to no more than 100,000 B/D because Japan generally relies on long-term supply arrangements. The Japanese oppose any requirement that Alaskan oil be transported in U.S. flag vessels, as it would set a precedent for other oil suppliers, and higher than market rate transportation costs would reduce incentives to purchase ANS crude. On the investment side, a poll of Japanese companies reveals that the Japanese have an interest in investing in ANS crude development depending, again, upon commercial considerations of the projects.

The Department of State has noted that, lifting the ban on exports - could:

- Improve Japan's energy security by providing it with a new source of oil.

- Maintain the momentum for increased energy cooperation, especially U.S. exports of coal and gas, as envisaged by the establishment of the U.S.-Japan Working Group on Energy and the Joint Energy Policy Statement of President Reagan and Prime Minister Nakasone of November, 1983;

- Demonstrate that the United States is committed to maintaining a free and open global trading system;

- Reduce marginally the U.S.-Japan trade imbalance (although the overall U.S. trade balance would be largely unaffected as oil exports would be offset by oil imports from elsewhere);

- Encourage further reciprocal market-opening measures by the Japanese;

Contribute to a more independent Japanese stance vis-a-vis Middle East oil suppliers.

4. Relations with the Republic of Korea

At the United States - Korea Bilateral Economic Consultations in August 1985, during Energy Secretary Herrington's trip to the ROK in March and in response to a specific ANS study questionnaire, the Koreans expressed keen interest in Alaskan oil and requested that the United States provide Korea with equal access if the ban on ANS exports is lifted. The ROK is highly dependent on imported energy resources and members of its government have told U.S. negotiators that Korea values the U.S. as a reliable supplier of energy. However, possible restrictions on ANS crude or termination in the event of a short supply crisis would reduce the "supply security" benefits in the view of ROK government sources. Requirements tying ANS exports to U.S. flag carriers would also negatively affect the level of ROK interest in ANS oil. The Koreans emphasized that price and quality would be the motivating consideration behind Korean purchases of ANS oil. They also believe that lifting the ANS crude export ban will lead to a reduction in the ROK trade surplus with the United States, a development viewed as mutually favorable by the Koreans.

5. Relations with Taiwan

Representatives of Taiwan have also expressed strong interest in access to ANS oil, most recently at the trade talks held in October 1985. In response to an ANS crude study questionnaire, representatives of Taiwan's Chinese Petroleum Corporation (CPC) reiterated their strong willingness to purchase ANS oil to increase supply diversification. Purchasing concerns are steadiness of supply, quality, price and economics of transportation. CPC representatives preferred that ANS exports not be tied to U.S. flag carriage unless such transportation was cost competitive. At present, CPC would consider initial purchases of 5,000 - 10,000 barrels/day with subsequent increases a possibility as current obligations expire. Were ANS crude exports liberalized, CPC officials expressed interest in investing in ANS crude production projects. Further, Taiwan authorities believe ANS exports would reduce Taiwan's trade surplus with the United States.

6. Relations with Mexico

Exports of Alaskan oil could increase the potential for Mexican oil sales to the United States. Any such sales could help to alleviate Mexico's current serious foreign debt service problems, which have been exacerbated by declining oil prices in the past few years. However, it should be noted that Mexico has a policy of limiting oil export to any one country to 50 percent of total oil exports, but

has been flexible in applying this policy. With oil prices falling, the GOM may find that its interests are best served by increasing exports to geographically closer markets so that it may realize a greater percentage of the total oil price. Although Mexico has large crude oil export potential, it is impossible at this stage to predict how much additional oil the Mexicans may be prepared to ship to the United States, and public speculation on the subject is not advisable.

7. Relations with Ecuador

A lifting of the ban could have favorable implications for U.S.-Ecuadorean relations. The U.S. West Coast was a major market for crude exports from Ecuador prior to the opening of the Alaska pipeline. It currently serves as a supplier of crude to the United States Gulf Coast. Petroleum accounts for 65 percent of Ecuador's exports and 12 percent of its gross domestic product. With declining oil prices, Ecuador, like other oil producing countries, has suffered a decline of export revenue. An increase in Ecuadorean crude sales to the United States would result in reduced transportation costs, higher netback prices, and thereby offset declining oil export revenues. One area of concern for the Ecuadoreans is the possibility that exports of ANS crude to Asia, in particular to the ROK and Taiwan, might affect Ecuador's own exports of oil to the area. Asian markets are Ecuador's prime long-term contract buyers.

8. Relations with Venezuela

The Venezuelans are also suffering from the decline in oil prices. Venezuela, although a member of OPEC, could find it in its national interest to increase production to preserve export earnings. Its oil reserves are sizeable and it has been an important source of U.S. oil. An estimated 11 percent (or 116,000 B/D) of Venezuelan oil exports was sold to non-affiliated European customers in 1984. There is no reason why a portion of this oil could not be diverted to the United States if market opportunities existed.

9. Relations with Panama

The Trans-Isthmian oil pipeline across Panama began operation in October 1982. This pipeline has reduced the cost of shipping ANS crude through the Panama Canal to the United States Gulf and East Coast markets. This pipeline which has an average maximum capacity of 800,000 barrels/day, is a joint public-private venture with the Government of Panama (through Cofina, the National Finance Corporation) at 40 percent equity; Northville Terminal Corporation (U.S.) at 38.75 percent equity and Chicago Bridge and Iron Industries (U.S.) at 21.25 percent equity. As of June 30, 1985, fixed assets (petroleum facilities and land rights at cost) amounted

to \$347.7 million. The original project was financed by \$290 million in commercial bank loans and \$60 million in shareholder notes and equity. Approximately \$50 million in original debt remains to be repaid. Current planning calls for final payment on this debt to be made in mid-1986.

The Government of Panama has gone on record as opposing any lifting of the export ban on Alaskan North Slope oil. In a letter dated March 25, 1985 to President Reagan, former Panamanian President Barletta stated that the Trans-Isthmian pipeline is essential to Panama's economic and political stability. The Panamanians estimate that termination of the pipeline could cost Panama an estimated \$150 million per year and 700 jobs. It could seriously affect a Panamanian economy already stuck in the doldrums and in need of reform and renewed growth. The pipeline represents the single largest capital investment in Panama in recent years and is one of the country's most important ongoing industries. Panama's Trans-Isthmian pipeline will be negatively affected in any event by the All-America Pipeline, which is now under construction and is scheduled to transport up to 300,000 B/D of crude from California to Texas beginning in 1987.

10. Relations with Costa Rica

Several firms have expressed interest in building two pipelines across Costa Rica to transport crude (including Alaskan North Slope) from the Pacific to the Caribbean and vice-versa. The project is currently in its initial planning/feasibility stage.

11. Relations with Western Europe and Canada

The repeal of the export ban of North Slope oil would provide concrete evidence of U.S. commitment toward a more open trading system and to strengthening cooperation on international energy policy with our Western European and Canadian allies. The United States has encouraged non-OPEC oil producers like the UK and Norway to continue to rely on the free market in determining oil prices and quantities, and to resist efforts by OPEC to control the market. Both present secure and viable alternatives to ANS oil.

The Canadians in June 1985 agreed to allow the free exportation of Canadian crude oil to the United States, and the United States permitted the export of U.S. crude oil from the lower 48 States to Canada. Lifting the continuing export restrictions on ANS crude would present the opportunity to develop potential sharing arrangements of oil and could improve the efficiency of transportation and supply system of oil for both the United States and Canada.

From the perspective of Western Europe as a consumer of oil, demand has leveled off due to improved energy conservation and diversification. Therefore, potential increased U.S. purchases of oil from the North Sea, Mexico, etc., do not appear to pose a threat to present Western European oil supplies, nor do they necessarily entail increased European dependence upon Middle East oil.

12. Relations with the Middle East

At present, U.S. dependence on the Middle East for crude oil supplies is modest. The United States took only 7 percent of its oil imports from Middle East suppliers in the first three quarters of 1985, equivalent to 2 percent of U.S. consumption. U.S. oil imports passing through the Strait of Hormuz were 570 thousand B/D in 1984, equivalent to 4.9 percent of total U.S. imports. Large volume exports of ANS crude oil may increase our dependence on Middle East oil.

13. State and Energy Departments Consultative Process

The prospect of ANS oil exports has been discussed at several sessions of the semiannual U.S.-Japan Energy Working Group and Energy Experts Meetings. Most recently, the issue was discussed at the U.S.-Japan Energy Working Group held March 1986 and between Energy Secretary Herrington and Prime Minister Nakasone during the Secretary's trip to the Far East in March 1986.

ROK Government officials and Taiwan authorities responded to an ANS study Questionnaire through diplomatic channels.

The ANS oil export issue was discussed with the Koreans during the last round of US-ROK Energy Consultations held in August 1985 and during Secretary Herrington's visit to the ROK; with Taiwan's representatives during trade negotiations last fall; and with Canadian delegates at the biannual Energy Consultative Mechanism (ECM) meeting. We anticipate that the North Slope oil issue will be discussed again at the next meeting of the ECM in the spring.

The GOP has voiced its concern over the ANS oil issue through an exchange of letters as noted above. In addition, the American Embassy in Panama discussed the study and the ANS export scenarios with the Government of Panama for the specific purpose of this study.

14. Federal Register Comments on ANS Exports

The Department of Commerce received many comments from interested parties both in favor of and opposed to lifting the ban on ANS crude oil exports. Comments supporting lifting the ban follow.

For example, the State of Alaska noted in its January 23, 1986 Federal Register comments, that "oil exports from the United States to our Pacific Rim allies would strengthen our alliances with these countries and would correspondingly reduce their reliance on unstable foreign sources. Authorization for even limited exports could provide a basis for securing significant trade concessions from Japan and other Pacific trading partners."

In a statment to the House Foreign Affairs Committee on November 20, 1985, Charles Ebinger of the Center for Strategic & International Studies made the following remarks:

"Removing the restrictions on Alaskan oil exports is good for U.S. and allied energy security and will send important signals to a vital trading partner - Japan. By allowing Alaskan oil exports to Japan, not only will substantial transportation savings be effected but also Alaskan oil exports can be offset by imports from Venezuela and Mexico - two countries of vital national security interest to the United States. Both these nations have large international debts owed to American and international banks."

Dr. S. Fred Singer of George Mason University also provided testimony before the Foreign Affairs Committee that supports the case for lifting export controls on ANS crude:

"Some of the opposition to Alaskan oil exports comes from the mistaken belief that Japan would derive special benefits, implying that the United States would loose corresponding benefits. This idea is completely contrary to any economic analysis. Japan would pay the same price for Alaskan oil landed in Yokohama as they pay for any other world oil landed there by the principle of free competition. To the Japanese it should not matter where the oil comes from, as far as price is concerned."

"However, the import of Alaskan oil would reduce the United States trade deficit with Japan by \$15 billion per year, and one could argue that this would be helpful to both nations by at least providing psychological benefits."

Finally, the American Association of Exporters and Importers support the opinion that the decontrol of ANS crude oil will bring positive benefits to Japan, for which "diversifying its sources of petroleum is a prime goal of the country's leaders. For Japan, the shift of some of its exports surplus from Japan to the U.S. would be an economic boom."

Although the previous arguments clearly support the view that ANS crude oil exports promote U.S. foreign policy and energy security interests, this perspective is not unanimous. A number of public officials, consumer, labor and industry groups responded to the Department of Commerce Federal Register Notice and opposed the lifting of the ANS export ban on foreign policy/energy security grounds.

For example, Congressman Stewart McKinney (R-CT) notes that "Alaskan oil exports would weaken our national and energy security. The U.S. is a net importer of oil. Therefore, any oil which we export will have to be replaced with imports. Replacement oil would come from the Persian Gulf, not Mexico, Venezuela or Canada as been suggested." Further, Congressman McKinney notes that ANS exports would not help solve our trade problems with Japan. "The U.S. suffers from an industrial trade deficit with Japan, not a commodities trade deficit. Exports of oil would only perpetuate this situation by cosmetically lowering our bilateral trade deficit with Japan, therefore reducing pressure on the Japanese to open their market to U.S. manufactured and agricultural goods."

The AFL-CIO also noted that the United States remains a net oil importer and that ANS exports would weaken rather than improve the U.S. foreign policy position. Specifically, they assert that "Alaskan exports would, to the extent they relieved Japan's energy security, transfer a portion of that insecurity to the U.S."

The Citizen/Labor Energy Coalition argued that lifting the ban of ANS crude is contrary to our energy security and foreign policy interests because "replacement oil would likely come from OPEC and Middle East sources...The nations outside of the OPEC Middle East that could conceivably increase production--Venezuela and Mexico--are very unlikely to do so."

J. NATIONAL DEFENSE IMPLICATIONS OF ANS EXPORTS

The U.S. Government employs oil product tankers to transport petroleum products for support of global military requirements. An adequately sized tanker fleet under U.S. control is essential to our nation's ability to supply American forces abroad in the event of a conflict.

Export of ANS crude will have two consequences that are of significant concern to the national defense: (1) a decline in defense readiness caused by a loss of tankers from the active U.S. fleet, and (2) a reduction of the active pool of maritime labor that would be available in an emergency to operate the U.S.-flag merchant fleet.

Militarily useful tankers include "coated" tankers between 6,000 deadweight tons (DWT) and 82,000 DWT plus several larger coated vessels capable of transitting the Panama Canal. Coated tankers have chemically treated cargo tanks. These vessels are capable of carrying "clean" cargoes of defense mobility fuels (jet fuels, gasolines, and diesel fuels) after their tanks have been cleaned following carriage of "dirty" cargoes such as crude oil or residual fuel oil. Uncoated tankers up to 100,000 DWT are militarily useful for the carriage of "dirty" bunker fuels. Because of the wide variation of ship sizes, tanker requirements are expressed in terms of a standard measure, the "handy sized tanker equivalent" (HSTE). One HSTE equals 200,000 barrels of liquid cargo capacity, or about 28,000 DWT.

Several recent studies of emergency sealift requirements conducted jointly by the Departments of Defense and Transportation concluded that the existing U.S.-flag tanker and controlled fleet (i.e., U.S. owned but foreign flag) are not adequate to meet the concurrent requirements to support the deployment of U.S. forces and to meet U.S. domestic petroleum transportation requirements in an emergency.

Wartime military tanker requirements were derived in the DOD Sealift Tanker Study. The current planning scenario envisions a global conventional war with U.S. forces supplied with petroleum products from traditional Western Hemisphere sources only. Under this scenario (Group 1 sourcing), 275 coated HSTE are needed to meet military petroleum movement requirements. Two other scenarios with greater uncertainty of product supply assurance were also considered. If product continues to be available from sources elsewhere in the world outside of the war zones (Group 2 sourcing), the coated tanker requirement falls to 193 HSTE due to shorter supply lines. If sources in the war zones are included in the supply pattern (Group 3 sourcing), the military coated tanker requirement is estimated to be 146 HSTE.

Assuming that the Jones Act is waived during the conflict to allow foreign flag vessels to enter the U.S. domestic crude oil trade, 53 additional coated HSTE are needed to meet the domestic requirements for "clean" product movement. With no Jones Act waiver, the civilian coated tanker requirement may be as high as 195 HSTE. Thus, depending on assumptions about military product sourcing and domestic coastal trade, the total U.S. requirement for coated tankers can vary from 199 HSTE (Group 3 sourcing and Jones Act waiver) to 470 (Group 1 sourcing, no ANS exports, and no Jones Act waiver).

The DOD Sealift Tanker Study assumes the availability to the U.S. Government in 1990 of four groups of vessels: (1) U.S. flag tankers currently under private and U.S. Government charter (including Military Sealift Command tankers), (2) foreign flag tankers under U.S. ownership (effective U.S. control - EUSC), (3) the U.S. Ready Reserve Fleet (RRF), inactive vessels in the National Defense Reserve Force which are maintained in a high state of readiness for defense use, and (4) expected additions to the RRF by 1990. Due to maintenance schedules and commitments to Navy fleet operations, a fraction of the total capacity will not be available for bulk petroleum product movement at any given time. The baseline 1990 coated tanker fleet, assuming no changes in the current ANS trade, is shown in the table below.

TABLE IV (J) 1

1990 BASELINE COATED TANKER FLEET AVAILABILITY
(Derived from DOD Sealift Tanker Study)

<u>Fleet</u>	<u>Vessels</u>	<u>HSTE</u>
U.S. Flag	126	216
EUSC	42	60
RRF	<u>16</u>	<u>15</u>
subtotal	184	291
Less Maint./Fleet Ops	<u>16</u>	<u>16</u>
Total Available	168	275

According to the Maritime Administration, 11 militarily useful coated tankers (25 HSTE) are projected to be displaced from the U.S. flag tanker fleet by 1990 due to changes in domestic crude oil distribution patterns and CDS repayment by owners of vessels entering the domestic trade. Thus, 250 HSTE of coated tankers are expected to be available by 1990 to meet military

IV-65

and civilian petroleum logistics requirements in the event of a conflict. Under ANS export scenarios, up to 11 additional militarily useful coated tankers (28 HSTE) would be displaced.

TABLE IV (J) 2

CUMULATIVE DISPLACEMENT OF MILITARILY USEFUL U.S. FLAG COATED
TANKERS UNDER ANS EXPORT SCENARIOS
(In HSTE, based on MARAD estimates)

<u>ANS Exports</u>	<u>1987</u>	<u>1990</u>
None	16	25
50 MBD	19	28
100 MBD	26	38
200 MBD	29	38
500 MBD	29	43
<u>Unconstrained Exports</u>	29	53

The comparison of wartime requirements with available tanker capacity is summarized in the table below. Under the conservative product sourcing option (Group 1) and wartime waiver of the Jones Act for the domestic crude oil trade, there is expected to be a shortage of available coated tanker capacity relative to requirements by 1990 under any of the export scenarios considered in this report. Under the medium-risk sourcing option, (Group 2), capacity is inadequate with ANS crude exports of 100 MB/D or more. Under the high-risk sourcing option (Group 3), tanker capacity is adequate under any export scenario.

IV-66

TABLE IV (J) 3

SUMMARY OF EXPECTED WARTIME COATED TANKER
REQUIREMENTS AND AVAILABILITY - 1990
(In HSTE, based on MARAD estimates)

<u>Tanker Requirements</u>		<u>Group 1</u>	<u>Group 2</u>	<u>Group 3</u>
Military		275	193	146
Civilian		53	53	53
Total Requirements		328	246	199

<u>Export Level</u>	<u>Tanker Availability</u>	<u>Tanker Capacity Shortfalls</u>		
		<u>Group 1</u>	<u>Group 2</u>	<u>Group 3</u>
No Exports	250	78	-	-
50 MBD	247	81	-	-
100 MBD	237	91	9	-
200 MBD	237	91	9	-
500 MBD	232	96	14	-
<u>Unconstrained Exports</u>	222	106	24	-

Should the Jones Act not be waived in wartime, the comparisons shown above become even less favorable. Clearly, the United States faces serious difficulties in meeting its sealift tanker requirements (under current planning assumptions) in the event of a major global conflict. These difficulties would be exacerbated by the likely tanker fleet displacements associated with the export of ANS crude oil. The estimated loss of up to 53 HSTE of coated tanker capacity by 1990 (if ANS exports are allowed) would have negative effects on the ability of the United States to fulfill its civilian and military petroleum shipping requirements during a major wartime emergency. (Note: The estimate of 53 HSTE assumes both: (1) a redistribution of ANS trade flows with more shipments to the West Coast and less to the Gulf and East Coasts during 1987-1990, and (2) Unconstrained ANS exports. See Table IV (J) 4 for details.)

However, not all tankers that are laid-up would be lost to the U.S. fleet. Those tankers that have been financed by Title XI guaranteed mortgages would, upon default, eventually become the property of the U.S. Government. As such, they could be transferred to the RRF, thus alleviating the loss to defense capability. Other displaced militarily-useful tankers that are not covered by Title XI guaranteed mortgages would have to be purchased by the Navy if this capacity is not to be lost to the U.S. sealift capacity. The cost to the U.S. Government of purchasing displaced militarily-useful tankers as the result of ANS exports could be as much as \$34 million in addition to the Title XI expenditure. The Government would also have to maintain the ships acquired for the RRF at an annual cost of about \$900,000 per vessel. These impacts are summarized in Table IV (J) 4.

Other than continued restriction of ANS exports and/or maintenance of a larger RRF, policy options which would assist in the development and maintenance of adequate strategic sealift tanker capacity include: (1) pursuit of allied commitments to provide tankers in wartime, (2) greater use of commercially chartered foreign flag tankers in wartime, (3) use of less restrictive product sourcing assumptions in the development of militarily useful tanker requirements, and/or (4) greater prepositioning of war reserve petroleum inventories in forward areas. Any combination of these options entails higher levels of risk to national security than the current policy of restricting ANS exports.

TABLE IV (J) 4

Impact of AMS Crude Oil Exports on the Coated Militarily Useful Tanker Fleet 1/
 8% Real Discount Rate, 1985 Dollars

Export Scenario	Total Tankers Laid-Up		Coated Militarily Useful Tankers Laid-Up			Available to U.S. Government through Title II				Available to U.S. Government through Purchase			
	No. of Ships	DWT (000)	No. of Ships	MSIE	DWT (000)	No. of Ships	MSIE	(000)	Million \$	No. of Ships	MSIE	(000)	Million \$
No Exports 2/:													
1987	11	603	0	16	633	3	9	263	79.2	3	7	170	7.2
1990	6	640	3	9	750	3	9	250	30.6	0	0	0	0.0
Total, No Exports	17	1,243	11	25	683	6	18	513	109.8	3	7	170	7.2
Impact of Exports:													
50,000 D/B													
1987	2	136	1	3	81	1	3	81	3.7	0	0	0	0.0
1990	1	191	0	0	0	0	0	0	0.0	0	0	0	0.0
Subtotal, Exports Only	3	327	1	3	81	1	3	81	3.7	0	0	0	0.0
Total, All Impacts	20	1,570	12	28	764	9	21	594	113.5	3	7	170	7.2
100,000 D/B													
1987	4	360	3	10	262	3	10	262	39.0	0	0	0	0.0
1990	2	327	1	3	81	1	3	81	3.9	0	0	0	0.0
Subtotal, Exports Only	6	687	4	13	343	4	13	343	42.9	0	0	0	0.0
Total, All Impacts	23	1,910	15	38	1,026	12	31	636	152.7	3	7	170	7.2
200,000 D/B													
1987	7	616	4	13	343	4	13	343	44.4	0	0	0	0.0
1990	2	500	0	0	0	0	0	0	0.0	0	0	0	0.0
Subtotal, Exports Only	9	1,116	4	13	343	4	13	343	44.4	0	0	0	0.0
Total, All Impacts	26	2,397	15	38	1,026	12	31	636	154.2	3	7	170	7.2
500,000 D/B													
1987	9	1,109	4	13	343	4	13	343	44.4	0	0	0	0.0
1990	13	1,900	3	5	131	1	2	43	33.7	2	3	80	2.7
Subtotal, Exports Only	22	3,009	7	18	474	5	15	386	78.1	2	3	80	2.7
Total, All Impacts	39	4,340	18	43	1,157	13	33	699	182.9	5	10	250	9.9
Unconstrained Exports													
1987	9	1,109	4	13	343	4	13	343	44.4	0	0	0	0.0
1990	23	3,204	7	15	379	2	3	80	39.1	3	12	299	34.1
Subtotal, Exports Only	32	4,313	11	28	722	6	16	423	103.5	3	12	299	34.1
Total, All Impacts	49	5,556	22	53	1,405	16	36	936	213.3	6	19	469	61.3

1/ Annual maintenance costs are included. The costs of acquiring uncoated tankers under 100,000 dwt are excluded from these estimates. However, in the No Export case, 3 uncoated tankers (157,100 dwt; 6 MSIE; 80.1 million estimated RRF purchase price) would be displaced by 1987. In all of the export scenarios, 1 uncoated tanker (179,000 dwt; 3 MSIE; 825.6 million estimated Title II default) would be displaced in 1987. At an export rate of 500,000 D/B, 1 uncoated tanker (139,000 dwt; 1 MSIE; 810.7 million estimated RRF purchase price) would be displaced by 1990. Unconstrained exports would displace 2 uncoated tankers (190,000 dwt; 4 MSIE; 847.3 million estimated RRF purchase price) by 1990.

2/ Assumes a redistribution of AMS trade flows with more oil shipments to the West Coast and less to the Gulf Coast. This results in a reduction in tanker requirements.

V. THE APPROPRIATENESS OF MAINTAINING EXPORT CONTROLS

The Administration believes that reliance on market forces is the most effective means to promote U.S. energy security. While lifting the ban on Alaskan crude oil exports would be in line with this objective, some government analysts point out that a number of other factors must be taken into consideration when making such a determination.

The ban on Alaskan crude oil exports should also be evaluated based on a number of peculiar institutional considerations which have developed since the Congress passed the Trans-Alaska Pipeline Authorization Act in 1973. These considerations relate to a wide range of interested parties with often divergent concerns and therefore must be evaluated as such. From a public policy perspective, changes in the current export control regime should take into account both the policy objectives of the Administration as well as the existing commercial relationships and ANS oil infrastructure that have been in place and operating for over a decade.

This section evaluates the costs and benefits to the United States in general and to specific affected parties in particular of decontrolled ANS crude oil exports. It also addresses the administrative and commercial aspects of a partial lifting of the export ban.

A. BENEFITS AND COSTS

This study examines the general economic efficiencies as well as sectoral/public policy impacts of removing the ban on ANS crude oil exports. Overall, a lifting of the ban would reduce government caused economic distortions and inefficiencies, and result in general welfare gains, but would have a negative impact on several particular sectors.

The principal benefits of a total lifting of the ban on ANS crude oil exports include: (1) increased tax revenues for the U.S. Government as well as the States of Alaska and California, (2) enhanced efficiency of the energy distribution system due to transportation savings, (3) additional oil producer profits, (4) improved energy security for U.S. allies in the Far East. Large exports to the Pacific Rim could result in a reduction of the U.S. bilateral trade deficit with Japan by \$3-5 billion per year during the 1990s, (5) increased oil export opportunities for friendly Western Hemisphere countries (Mexico, Venezuela, Ecuador), (6) incentives to produce oil in Alaska and California.

On the other hand, the principal costs of lifting the ban involve: (1) possible increased U.S. dependence on oil imports to replace the ANS exports (Note: Some of the replacement crude oil imports will be from the Middle East); (2) approximately \$500 million in expenditures by the U.S. Treasury to indemnify mortgage defaults on MARAD Title XI tankers and to purchase militarily useful tankers for the U.S. Ready Reserve Force; (3) economic losses to west Coast shipping industry interests, including employment; (4) a decrease in Government of Panama revenue of \$100-\$150 million annually if the Trans-Isthmian pipeline is forced out of business.

1. Benefits

a. Fiscal Revenues to Federal and State Governments

The U.S. Government registers a net gain in tax revenues after the deduction of some shipping-related losses.

- o Increased Federal revenues total \$4.6 billion between 1987-2000.
 - The bulk of the revenues come from taxes on an increase in Alaska and California wellhead prices on existing production.
 - A smaller amount is derived from increased tax revenue arising from new oil production in the two States.

Both Alaska and California receive increased revenues under the Unconstrained Exports Scenario.

- o Alaska earns \$3.95 billion between 1987-2000 under the Unconstrained Exports Scenario.
 - These revenues stem primarily from the increase in the wellhead price of \$1.70 per barrel in 1990.
 - Increases in Alaskan oil production (an additional 10,000 B/D by 2000) yield a much smaller share of the revenues.
- o California receives \$1.63 billion between 1987-2000. Here too, the State earns the bulk of its revenues from increased wellhead prices and smaller amounts from higher output -- 18,000 B/D more by 2000.
- o California refiners and consumers incur costs in terms of higher energy prices that result from lifting the ban and eliminating the "West Coast Discount."
- o Regardless of the export scenario, complete or partial, Alaska increases fiscal revenues without incurring any offsetting costs.

b. Energy Efficiency and the Oil Companies

The primary result of Unconstrained Exports would be to provide significant transportation savings. These savings represent a resource efficiency gain and translate into higher wellhead prices in Alaska and California.

o After-Tax Oil Industry Profits

- Oil Industry profits amount to \$7.7 billion between 1987-2000, or \$555 million on an annualized basis.
- Producers in Alaska earn \$3.7 billion while California operators earn \$4.0 billion. The latter earns more because of the slightly higher oil production response in California.
- On every \$1 per barrel increase in the wellhead price, the oil producers would earn approximately \$0.40 per barrel after taxes.
- Increased profits, however, are offset by some losses. The oil companies will incur some losses on vessel charters and their own tankers which will be forced out of work as a result of lifting the ANS export ban.
- Additional profits from higher wellhead prices would provide companies with capital funds for Alaskan oil exploration and development. In the long-term, increased production will benefit consumers.
- Increased exploration and development will also create jobs in the petroleum industry.

c. Trade and Security Relations with Pacific Rim Countries

The U.S. and Pacific Rim countries benefit in several ways. Pacific Rim countries would have access to at least several hundred thousand barrels per day of ANS crude over the 1987 - 2000 period. Imports at this level could reduce the region's oil dependence on the Middle East.

ANS exports could reduce Japan's bilateral trade surplus with the U.S., which was \$49.7 billion in 1985. ANS exports to the ROK and Taiwan could produce similar results on those bilateral trade surpluses.

The Pacific Rim countries have expressed an interest in an approximate maximum of 150,000 barrels/day for the immediate future. These small volumes could result in a small reduction in their trade surplus with the U.S. However, if the U.S. exported 870 MB/D to Pacific Rim countries in 1990, at a price of \$24 per barrel FOB Valdez, there could be a potential reduction of \$7.6 in the current account surpluses with these countries.

d. Oil Imports From Western Hemisphere

ANS exports would provide friendly Western Hemisphere countries with increased oil export opportunities. Some of these countries urgently need additional revenues to repay loans to banks.

2. Costs

a. Oil Imports

- o The ultimate level of U.S. oil imports required to replace ANS exports would depend on refinery efficiency and net processing gains on the West Coast.
 - To the extent there are large processing gains, the United States would not have to replace the ANS crude exports on a barrel-for-barrel basis.
 - If refinery processing gains are lower, substantial oil imports would be needed to replace ANS exports.
- o Large ANS exports could result in additional imports from the Middle East during the 1990s.
 - Under the Unconstrained Scenario, U.S. imports of Middle East oil could increase by up to 590 MB/D in 1990 and 310 MB/D in 1995, respectively.
 - To the extent U.S. oil output declines in the 1990s, additional oil imports would be required. The Middle East remains the marginal supplier and the replacement of ANS exports would increase U.S. import dependence on oil imports.

b. Militarily Useful Tankers

- o A number of U.S. tankers that can carry military mobility fuels will be forced out of business if the ban were to be lifted completely.

- The U.S. Government would be required to purchase displaced military useful tankers or risk having foreign tankers carry a large proportion of U.S. military mobility fuels during a crisis.
- As U.S. tankers are displaced from the ANS trade, the U.S. dependence on foreign tankers to carry the replacement oil imports would become greater.

c. Maritime Losses

The shipping sector would experience the largest overall economic losses. The severity of the losses would be in direct proportion to the level of exports, with the Unconstrained Exports Scenario resulting in the largest dislocations. The scope of the maritime losses extends to existing ships under public or private mortgage guarantee as well as the prospective loss of business for shipbuilding and repair yards.

o MARAD Title XI Program

- Unconstrained Exports of ANS crude would probably lay-up 32 tankers totalling 4.3 million DWT or over 40 percent of operating U.S. fleet tanker tonnage.
- Approximately \$382 million of Federally guaranteed loans would be subject to default.
- Of the above amount, nearly \$200 million would be subject to nearly immediate default.
- Even if a portion of the export trade were reserved for U.S.-flag tankers, there would likely be no reduction in Title XI losses incurred by the domestic tanker fleet. Exports would probably be carried on existing tankers that were built with a construction subsidy for the U.S. foreign trade. These vessels have not repaid the subsidy to gain eligibility for the domestic trade.

o Militarily Useful Tankers

- \$34 million in U.S. Treasury expenditures would be needed to acquire tankers for the Ready Reserve Force. These expenditures are for product coated tankers that can carry clean products for the military during an emergency.

- o Private Owned Tankers

- Private sector tanker owners could be exposed to a potential default of \$540 million in the Unconstrained Exports Scenario.
- If all or part of this amount is written off against income, it will cause a loss of Federal income tax receipts.

- o Employment

- Over 2000 seafarers would be displaced under the Unconstrained Exports Scenario.
- These seafarers would have difficulty finding alternative work in the U.S. merchant shipping industry.

- o Shipbuilding and Repair

- ANS exports that displace U.S. Jones Act ships could mean less future demand for new tankers and repair to existing vessels.
- The cumulative loss of revenue for maintenance of repair resulting from ANS exports could amount to about \$392 million.

d. Loss of Panamanian Revenue

- o Trans-Isthmian Oil Pipeline

- Termination of the oil pipeline across Panama resulting from lifting the ANS export ban would cost the Government of Panama an estimated \$100-150 million per year in direct revenue and would have a major negative impact on the Panamanian economy.

B. OTHER ISSUES

1. Oil Production

Another way of addressing the appropriateness of maintaining export controls is to examine the contribution of ANS exports to future North Slope oil production. Specifically, would lifting the export ban result in more Alaskan oil production than would have occurred with the ban in place? Section IV contains projections that ANS and California production will expand in 2000 by a combined total of 28 MB/D under the Unconstrained Exports Scenario. The combined increase of 28 MB/D amounts to approximately 1-1/2 percent of the current ANS output of 1.8 million B/D.

However, other factors should also be taken into consideration. The primary production response benefit associated with ANS crude exports is that it assists in maintaining ANS crude output at relatively constant levels through the early 1990s and then slows down the rate of decline of oil production. If ANS output were to decline at a more rapid rate during the 1990s, as some observers suggest, then the State of Alaska would have substantially lower fiscal revenues and there would be less oil for West Coast energy markets.

The second major production related issue is whether lifting the export ban would result in substantial foreign investment in Alaskan petroleum exploration and development. Foreign capital and technology to finance Alaskan exploration will depend upon the perceived direction of world oil prices and the attractiveness of lease offerings. It may also depend on the ability of foreign investors to negotiate guaranteed oil supply offtake rights.

2. Export Scenarios

The findings of Section IV are that a complete lifting of the ANS export ban yields the largest economic benefits. The 500 MB/D export scenario also yields positive benefits, while the smaller export scenarios -- 50, 100, and 200 MB/D -- result in limited economic benefits. Some critics of the current export ban have put forth proposals for a partial lifting of the ban. These proposals have run the gamut from freeing-up State of Alaska royalty oil to crude oil from new fields to straight volumetric export formulas. All of these proposals are designed to capture part of the increased transportation savings in the form of higher wellhead prices and government revenues.

The adoption of partial export volumes must be evaluated based upon a number criteria. Would a partial lifting of the export ban discriminate against one company in favor of another? Who would determine which parties are allocated export shares and in what amount? Who would administer a limited export regime and how would the costs be financed? The creation of a situation where one party or a group of parties receives preferred benefits at the expense of other parties unfairly penalizes certain companies. While there would certainly be no intent to cause economic disadvantage, a situation where one or two companies held export rights to several hundred thousand barrels per day of ANS crude would impair the ability of other companies to compete based upon market forces. It would confer advantages on certain parties while simultaneously preventing others from maximizing their economic opportunities. A government entity rather than the market forces would be making economic choices.

Another consideration is to determine the respective shares of export rights allocated to the oil companies and the State of Alaska. The most likely situation would be for a Federal Government entity to allocate export rights. In addition to the administrative cost of allocating export rights, there would be costs associated with issuing validated licenses pursuant to the Export Administration Act.

Finally, it is important to point out that this study only evaluates the implications of removing or modifying export controls on ANS crude oil. It does not address the costs and benefits of export controls on other domestically produced crude oil. From a public policy perspective, removal or modification of export controls on Alaskan crude should be considered in the context of overall restrictions on crude produced in the lower 48 states; i.e., if ANS crude oil exports are in the national interest, why should export restrictions be maintained on other domestically produced crude?

There are also practical difficulties associated with decontrolling exports of ANS crude without addressing other controls. As previously noted, there are five separate and often overlapping statutes that prohibit the export of domestically produced crude oil. Each statute permits the President to make a national interest finding to allow exports in special circumstances. At present, the statutory restrictions on ANS crude exports are the most stringent -- the Export Administration Act focuses specifically on ANS crude and the requirements for a national interest finding to permit exports are almost impossible to meet. However, even if the Congress were to remove or modify the restrictions on ANS crude set forth in the Export Administration Act, the President would still be required to make national interest findings to permit the export of ANS crude under the other statutes.

VI. IMPLICATIONS OF DECLINING OIL PRICES

While this study was under preparation, world oil prices declined substantially. World oil prices averaged \$25-28 per barrel in December 1985. (Note: The world oil price is defined here as the average U.S. imported refiner's crude acquisition cost.) The delivered U.S. price for foreign crude under contract dropped to \$13-15 per barrel by March 1986. Furthermore, spot cash and future prices for crude fell below \$12 per barrel. Some energy analysts, however, expect world oil prices to recover by 1990, so that the 1990-2000 analysis presented in this study still contains reasonable world oil price projections.

The oil price decline has resulted in actual oil prices that are below the lower end of the crude oil price range forecast used in this study of \$22 per barrel in 1987 (see Appendix A). Today, the range for contract prices for crude oil imported into the United States is estimated at \$13-15 per barrel. The recent price decline impacts on Alaskan North Slope (ANS) crude oil production, distribution flows, and Federal and State revenues.

The Interagency Working Group believes that it would be useful to address the impact of near-term lower oil prices on ANS crude exports. What follows is a brief analysis of implications of a \$15 per barrel oil price case on ANS exports in the 1986-1990 time frame, and is based on the DOE Oil Trade Model (OTM). The macroeconomic, energy production and pipeline tariff assumptions remain identical to those used in Tasks III and IV (see Appendix A).

The following analysis is derived from the Export Ban and Unconstrained Exports Low Price Scenarios for 1990. The Valdez FOB netback prices are based upon estimates of reduced shipping (see Appendix A) and lower tariffs that will be adopted under the terms of the Pipeline Settlements between the Justice Department and the companies operating the pipeline. Based upon a \$15 per barrel price, the lower shipping and pipeline tariff rates yield estimated 1990 FOB Valdez prices of \$12.34 and \$11.70 per barrel for West and Gulf Coast shipments in the Export Ban Scenario, and \$14.09 per barrel for West Coast sales in the Export Scenario (Table VI-5). It is important to note that under the Export Ban Scenario, there are only small shipments to the Gulf Coast by 1990. In the Export Scenario, however, these shipments are eliminated by 1990. Therefore, the Valdez FOB netback price for West Coast sales is the appropriate marker for evaluating price and revenue impacts of the low price Export Scenario.

A. LOW OIL PRICE SCENARIO

This study has pointed out that Alaskan oil is more expensive to develop and transport than oil found in the lower 48 States. North Slope oil shipping costs (including the Trans Panama Pipeline Tariff) currently amount to approximately \$1.09 and \$3.83 per barrel

VI-2

to the U.S. West and Gulf Coasts, respectively (see Table VI-1). When world oil prices averaged \$25-27 per barrel, this resulted in an FOB Valdez netback price of \$23-23.85 per barrel. On the other hand, the \$15 barrel scenario used in this Low Price Case would yield \$11.70 - 14.09 (see Table VI-5) per barrel FOB Valdez prices that amount approximately to a 50 percent decline in the FOB netback price in less than a year.

While the study makes no specific estimate of the price at which North Slope producers would be forced to curtail severely their current production, it was assumed and the results of the modeling run (see below) corroborated that operators with existing production would continue to operate at \$15 world oil prices -- i.e., \$11.70-\$14.09 per barrel FOB Valdez in 1990. To the extent that world oil prices and the resultant Valdez FOB netback declined below the FOB netback prices used in these low price scenarios and remained there, producers could decide to shut-in considerably more oil than estimated under the \$15 per barrel case. The oil companies operating in Alaska face a number of complex economic decisions if and when world oil prices decline below \$15 per barrel. The economic decisions on how much to produce and at what price should be governed by market forces and the respective commercial interests of various firms. With the removal of the export ban, well-head prices would rise to market levels and would allow producers to make economically sound decisions.

The commercial interests of companies in turn will depend upon the magnitude of their individual Alaskan investment and project-related debt, crude oil supply commitments, and perceptions regarding the future direction of oil prices. For example, a company that has heavy debts and operating charges may opt to produce for a short time at a very low or even a negative return. This company may justify production on a cash flow basis -- i.e., total revenue exceeds short-run variable costs -- such that choosing to operate will increase profits (or at least reduce losses). On the other hand, a company that has amortized its debt and has sources of lower cost crude may seek to maximize profits (i.e., 15-20 percent after taxes). This approach would argue for a particular company partially shutting-in some production until prices begin to increase. However, the company would still need to calculate its costs of shutting-in production in economic and political terms. Finally, a company decision to produce today depends on what value it sets on the costs to find and replace the barrel of crude that it produces today. If a company believes that it will cost \$15 per barrel to find and produce a new barrel of ANS crude, it may be reluctant to produce large volumes of crude at \$11.70 FOB netback prices.

Low oil prices force tough decisions on firms with development and exploration programs. For example, the low oil price may force one firm to defer or stretch-out development of a new field. Another firm may substantially revise its decisions to bid on new lease acreage while a third firm may elect to stretch-out or defer its offshore exploration. The key point here is that firms may continue to produce at low prices but new exploration and development will fall off in proportion to the companies' perceptions of the level and the duration of the oil price decline. The consequence could be a precipitous decline in post-1990 production and less ANS crude available for U.S. consumption and/or export -- if world oil prices persist at \$15 per barrel into the 1990s.

B. LOW PRICE CASE - ENERGY FLOWS

The \$15 price case was modeled using Export Ban and Unconstrained Exports Scenarios. These scenarios measured the difference in production and U.S. distribution under export ban and unconstrained export conditions. Tables VI-2 and 3 present the overall findings while Table VI-4 addresses the West Coast petroleum balance. Production impacts are not large because results for 1990 are near-term in nature. If oil prices persist at \$15 per barrel beyond 1990, production impacts would be significantly larger in 1995 and 2000.

1. Export Ban Scenario

- o ANS crude production declines by only 30 MB/D to 1.70 MMB/D (Table VI-4) as compared to the base export ban case (i.e., base case) while California output falls by 40 MB/D to 1.38 MMB/D.
- o Prices below \$15 per barrel, however, could result in proportionately larger oil production declines, particularly if prices approach operators' costs of production.
- o The West Coast (PAD V) receives an additional 300 MB/D of ANS crude as compared to the base case, while shipments to the East Coast (315 MB/D) and Puerto Rico (25 MB/D) are phased-out (Table VI-2).
- o Deliveries to the Gulf Coast remain at 200 MB/D level found in the base export ban scenario.
- o In addition to increased West Coast demand for ANS crude, lower oil prices with fixed per barrel shipping rates result in per barrel transportation costs that are a

VI-4

larger proportion of the purchase price. Therefore, less ANS crude will be shipped to the East Coast and Puerto Rico since shipping distances to these destinations are greater.

2. Unconstrained Exports Scenario

- o Rising consumer demand as a result of lower oil prices reduces exports in 1990 from 870 MB/D in the Base Case to 650 MB/D.
- o The reduction in 1990 exports to the Pacific Rim results in an 190 MB/D increase in ANS shipments to the West Coast from 830 MB/D to 1.02 MMB/D (Table VI-3).
- o Under this scenario, deliveries to the Gulf Coast, East Coast, and Puerto Rico are eliminated totally by 1990 (Table VI-3).

(NOTE: Both the Export Ban and Unconstrained Export Scenarios assume completion and full operation by 1990 of the All American Pipeline (300 MB/D) from California to Texas.)

Under some low oil price scenarios this pipeline may be delayed or operate at limited capacity, thus increasing the availability of West Coast crude.

3. West Coast Petroleum Balance

- o PAD V petroleum consumption (Table VI-4) in the low price export ban and export scenarios rises in 1990 by 140 and 120 MB/D, respectively over the base cases.
- o The lower oil prices encourage additional consumption while Alaska and California production declines are modest in both low price scenarios.
- o The major result of lower prices in the export case is higher West Coast demand and less exports (220 MB/D). While reduced exports yield less economic benefits in terms of lifting the ban, lower oil prices for PAD V consumers would represent a positive economic benefit in terms of lower inflation and fuel prices for U.S. manufacturers that compete in world markets.

C. PETROLEUM EXPLORATION AND DEVELOPMENT

The wellhead price impacts of lifting the export ban remain essentially unchanged but at lower world oil prices become relatively much more important. Unconstrained exports in 1990 would result in an increase of approximately \$1.75 per barrel in the wellhead price of all ANS crude. This increase in the price would result in raising the FOB Valdez price by \$1.75 per barrel in the export ban scenario to approximately \$14.09 in the unconstrained export scenario. Similarly, the export scenario benefits California producers. The wellhead price increases by \$1.84 per barrel above the \$12.13 level in the export ban scenario. Under low oil price scenarios the \$1.75 per barrel increase in the wellhead price could push prices from below break-even levels and thereby have a marked impact on near-term production.

The shipping component of the ANS crude prices becomes larger at low oil prices. Given the prospect of shut-in, near-term oil production in Alaska and California, the \$1.75 per barrel wellhead price impact resulting from lifting the ban may well play a major role in production decisions by companies.

The decline in the wellhead price as a result of lower oil prices is partially offset by the lower pipeline tariff. The pre-settlement 1985 pipeline tariff of \$6.11 per barrel is expected to decline to \$3.25 per barrel by 1990 (see Table VI-5), thereby increasing the wellhead price received by the producer and the base on which the State's income taxes are calculated. Therefore, net producer returns on the wellhead do not totally drive production decisions. Companies that own and operate the Trans-Alaska Pipeline (TAPS) will still earn large per barrel profits on TAPS. After the recovery of capital and operating costs on TAPS the companies that own and operate the pipeline are likely to earn profits in excess of \$2 per barrel. These companies' financial bottom line will be determined by joint oil production and pipeline operations. On the other hand, producing companies that have no financial interest in the pipeline will face a different set of economic calculations.

The key issue is the impact of prolonged low world oil prices on current and future Alaskan exploration and development. First, continued Valdez FOB netbacks in the \$12-14 per barrel range make go-ahead decisions on new marginal, remote onshore and offshore Gulf of Alaska deposits more difficult to justify from an economic perspective. Companies will either defer or stretch out existing developments. If, however, prices increase by 1988-89, operators will move ahead with new developments.

The decision on which course to pursue will depend upon individual company finances as well as the physical/technical elements of a given project. For example, a company about to make an investment

decision may go ahead with a project that involves the second stage of an existing field, or if the new project is located adjacent to the Trans-Alaska Pipeline (TAPS). Notwithstanding the level of financial return, a company may be forced to invest if the physical/technical aspects of the petroleum reservoir require workover. On the other hand, a firm may postpone a decision to develop a small offshore or remote onshore deposit that is not proximate to TAPS. A recent victim of the oil price drop was Conoco's recent decision to cancel phase II of the Milne Point field development.

Exploration for new reserves also raises economic issues. First, companies that have leased new acreage are likely to stretch out their exploration programs consistent with the overall corporate funds available for exploration. Expensive offshore exploratory drilling is likely to slow down. Onshore prospects will involve drilling adjacent to existing producing properties and other relatively low risk areas.

Low oil prices will certainly affect company reactions to large U.S. Government sales of new lease acreage. In fact, there could be situations where large new lease sales attract limited bids by companies. Again, the situation will depend on individual company cash positions, need for new reserves and perceptions of oil prices. In this regard, the Atlantic Richfield Company, the second largest oil producer in Alaska, is reported to have cut its 1986 exploration and production budget by \$1.0 billion to \$2.0 billion.

Separate but related to the petroleum development issue is the question of how to facilitate new ANS exploration during a period of falling oil prices. The following discussion addresses the constraints that must be removed to facilitate ANS exploration. The first issue is project economics. Private firms plan frontier and marginal energy projects on a long-term basis and require a stable long-term business environment and prospective netback prices that provide adequate incentives to invest. They require stable project costs and government tax rates. Given the large drop in oil prices, private firms are probably interested in tax regimes that balance exploration risk and development expenses against government revenue requirements. Second, the oil companies will seek to contain project construction costs. The scissors of declining prices and rising project development charges cut into profits. To the extent that companies and unions can curb construction charges, the profit picture will be better.

The third key area involves the environment and licensing/permit process. The companies operating in Alaska will be reluctant to commit limited exploration funds without access to attractive

onshore and offshore lease acreage. They will also push to streamline State licensing and permit processes. This could result in shortened time spans to develop Alaskan petroleum deposits and reduce project costs.

D. IMPACTS ON REFINERS AND CONSUMERS

The West Coast refining industry benefits from lower crude oil prices in the Export Ban and Unconstrained Export Scenarios. In both cases, PAD V refiners have access to large volumes of ANS crude at relatively low prices.

1. Export Ban

- o The lower ANS FOB netback price enables PAD V refiners to benefit from a West Coast Discount.
- o The Gulf Coast still receives small amounts of ANS crude (200 MB/D) at approximately \$11.70, thereby reflecting the large transportation differential.

2. Unconstrained Exports

- o The ANS wellhead price rises to \$14.09 per barrel and reflects a market based price on the West Coast.
- o Exports combined with growing PAD V demand put an end to the "West Coast Discount" and refiners now pay market prices for ANS crude.

Consumers benefit from the lower prices. The benefits vary between the Export Ban and Unconstrained Export Scenarios. The primary benefits are derived by West Coast consumers. In the Export Ban Scenario, consumers continue to benefit from the "West Coast Discount." Lifting the export ban eliminates the discount in the Unconstrained Export Scenario. Consumers, however, still receive the benefits of lower world prices for oil imports while in turn paying more for ANS crude because the "West Coast Discount" has been eliminated. To the extent that exports result in imports of light crudes that yield refinery gains of light product over time, consumers could ultimately receive small benefits from lower refining operating costs that translate into slightly lower product prices.

E. FISCAL IMPACTS

There are Federal and State fiscal impacts associated with the low oil price case. The impacts in the export ban case consist of reduced Federal and States of Alaska and California revenues resulting from the lower oil prices. The latter also insures the elimination of Federal Windfall Profit Tax (WPT) revenues from Alaska as well as California production.

The Export Case results in additional Federal and combined State revenues but the gain in Federal revenues is reduced about 25 percent from the \$1.6 billion increase associated with the Base Case Unconstrained Export Scenario in Section IV. The key points regarding revenues include:

- o The U.S. Government would receive approximately \$1.1 billion in fiscal revenues, while the States of Alaska and California would earn approximately \$1.3 billion and \$500 million, respectively.
- o Federal and State revenues will increase almost entirely in proportion to the wellhead price increase resulting from lifting the export ban (\$1.75 and \$1.84 per barrel for Alaska and California, respectively in 1990). There will probably be no benefits from increased Alaska and California oil production.
- o Lower export volumes and declining oil prices will reduce the revenue benefits as compared to the base case.

F. MARITIME IMPACT

The shipping sector experiences some financial losses at lower oil prices but less than what would be the result in the Base Case Export Scenarios.

1. Export Ban

- o Lower oil prices increase PAD V 1990 consumption and end deliveries to the East Coast and Puerto Rico.
- o The resultant change in demand for Jones Act tankers is the net difference between increased shipments to California and the end of deliveries to East Coast and Puerto Rico.
- o Additional declines in ANS production after 1990 would result in a lower demand for U.S. flag tankers. However, this development is sensitive to the timing and magnitude of the price decline.

2. Unconstrained Exports

- o Demand for U.S. tankers declines substantially but less than would be the case in the Base Unconstrained Export Scenario.
- o Exports of 650 MB/D result in less immediate losses to the U.S. flag tanker fleet.
- o If exports continue at those levels beyond 1990 and/or production declines more than in the Base Case, then the U.S. shipping industry will continue suffering financial losses beyond 1990.

G. EMPLOYMENT IMPACTS

Lower oil prices present a mixed blessing in terms of the labor impact. Reduced exports in 1990 result in less financial and employment losses to the shipping sector and the resultant lower unemployment. Alaskan petroleum exploration and development, however, slows down through 1990 and may decline substantially after that date. Reduced exploration and development may have two impacts on California and Alaska petroleum-related employment: (1) lower exploration and developments may mean that fewer new jobs are created, and (2) lower Alaska and California oil output (1990 export case) would probably result in the loss of existing jobs. The key point in terms of the labor impact is the duration of low oil prices and the timing of when oil companies would resume large new exploration in the two States. However, removal of the export ban could result in the retention of many of the oil-related jobs that would have otherwise been lost because of lower oil prices.

H. TRADE IMPACT

The impact on U.S. foreign commerce remains essentially unchanged in the base and low oil price cases. The trade impact will in large part be determined by the relative ANS export volumes and prices as well as the replacement imports. This is a very complex issue and it will also be driven by the duration and intensity of the oil price decline.

Separate but related to this issue is the fact that a prolonged period of low oil prices could result in expanded U.S. oil imports. This would be the case if U.S. oil exploration falls off, stripper well production is shut-in, and demand rises as a result of low oil

prices. Expanded oil imports would further exacerbate the U.S. trade deficit. To the extent that removal of the ANS export ban results in an increase in U.S. oil production or prevents the shutting-in of existing production, this could reduce imports and yield some benefits.

VI-11

TABLE VI-1

ANS ECONOMICS
UNDER VARIOUS PRICE SCENARIOS
(1985 \$/bbl)

	<u>Sales to West Coast</u>			<u>Sales to Gulf Coast</u>		
	<u>6/85</u>	<u>2/86</u>	<u>3/86</u>	<u>6/85</u>	<u>2/86</u>	<u>3/86</u>
Delivered Price	\$25.00	\$20.00	\$15.00	\$27.00	\$22.00	\$17.00
Less:						
Shipping Cost	<u>1.15</u>	<u>1.09</u>	<u>1.09</u>	<u>4.00</u>	<u>3.83</u>	<u>3.83</u>
FOB Valdez	\$23.85	\$18.91	\$13.91	\$23.00	\$18.17	\$13.17
Less:						
Pipeline Tariff*	<u>6.11</u>	<u>5.04</u>	<u>4.74</u>	<u>6.11</u>	<u>5.04</u>	<u>4.74</u>
Estimated Wellhead Price	17.74	13.87	9.17	16.89	13.13	8.43

* Assumes pipeline settlement tariff beginning in 1986.

Sources: Based upon Petroleum Intelligence Weekly - 6/24/85

TABLE VI-2

ANS OIL FLOWS UNDER LOW OIL PRICE
CASE - EXPORT BAN - 1990
(Million B/D)

<u>Export Ban Case</u>	<u>Base Case</u>	<u>Low Price Case</u>	<u>Change</u>
West Coast	1.160	1.460	+0.300
Gulf Coast	0.200	0.200	----
East Coast	0.315	0.010	-0.305
Puerto Rico/ Virgin Islands	0.025	----	-0.025
Pacific Rim	----	----	----
Total	1.700	1.670	-0.030
World Oil Price (1985 \$/Bbl.)	24.00	15.00	

Source: Department of Energy

TABLE VI-3

ANS OIL FLOWS UNDER LOW OIL PRICE CASE
UNCONSTRAINED EXPORT SCENARIO - 1990
 (Million B/D)

<u>Free Market</u>	<u>Base Price</u>	<u>Low Price Case</u>	<u>Change</u>
West Coast	0.83	1.02	+0.19
Gulf Coast	---		
East Coast	---		
Puerto Rico/Virgin Islands	---		
Pacific Rim	<u>0.87</u>	<u>0.65</u>	<u>-0.22</u>
Total	1.70	1.67	-0.03
World Oil Price (1985 \$/Barrel)	\$24.00	\$15.00	

Source: Department of Energy

TABLE VI-4

PAD V PETROLEUM BALANCE - 1990
(Million B/D)

	<u>Base Ban</u>	<u>Low Price Ban</u>	<u>Base Export</u>	<u>Low Price Export</u>
Demand				
Product Consumption	2.30	2.43	2.29	2.41
Refinery Fuel	<u>0.23</u>	<u>0.24</u>	<u>0.23</u>	<u>0.23</u>
Total	2.53	2.67	2.52	2.64
Supply				
Alaska Crude Production	1.73	1.70	1.73	1.70
California Crude Production	1.42	1.38	1.42	1.38
NGL	0.04	0.04	0.04	0.04
Crude Imports	0.08	0.06	0.26	0.29
Net Product Imports	(.04)	(.10)	(.05)	(0.04)
Product Shipments From Other U.S. Regions	(.04)	(.07)	0.10	0.07
Crude Shipments to Gulf via All American P/L	(.30)	(.30)	(.30)	(0.30)
Refinery Gain	<u>0.18</u>	<u>0.17</u>	<u>0.19</u>	<u>0.15</u>
Total	3.07	2.88	3.39	3.29
Excess Crude Supply				
Shipments to Gulf/East Coasts Under Ban	0.54	0.21		
Exports to Pacific Rim			0.87	0.65

Source: Department of Energy

TABLE VI 5

ANS ECONOMICS UNDER LOW OIL
PRICE SCENARIO - 1990
(1985 \$/bbl)

	<u>Export Ban</u>		<u>Unconstrained Exports</u>	
	<u>West Coast</u>	<u>Gulf/East Coasts</u>	<u>West Coast</u>	<u>Gulf/ East Coasts</u>
Delivered Price	13.34	15.00	15.00	----
Less:				
Shipping Cost	<u>1.00</u>	<u>3.30</u>	<u>0.91</u>	
FOB Valdez	12.34	11.70	14.09	
Less:				
Pipeline Tariff	<u>3.25</u>	<u>3.25</u>	<u>3.25</u>	
Estimated Wellhead Price	9.09	8.45	10.84	

Sources: DOE Oil Trade Model and Appendix A

VII. FINDINGS AND RECOMMENDATION

A. FINDINGS

The decontrol of ANS crude oil exports would have a number of economic and policy implications. Some of these effects can be quantified based on a number of predetermined economic assumptions while others are not subject to quantification.

This study concludes that decontrol would have long-term positive economic benefits for the economy as well as immediate economic benefits for a number of private sector interests (e.g., petroleum industry) as well as state and Federal Government revenue flows. Decontrol would raise wellhead prices and result in higher producer revenues as well as state and Federal taxes.

The study also concludes that decontrol would have a number of immediate negative implications for the maritime and related industries as well as West Coast consumers.

The balance of the trade consequences of decontrol is uncertain, even using predetermined macroeconomic assumptions. Some analysts project that decontrol would lead to a net positive change in the U.S. trade balance on the microeconomic assumption that exports would not be replaced by imports on a barrel for barrel basis. Other government analysts project that decontrol would lead to a net negative trade balance on the grounds that ANS exports would be replaced by imports on a barrel for barrel basis and carried on foreign rather than U.S. tankers. The United States would, therefore, lose the transportation element of each sale.

The employment implications are mixed. The maritime sector and industries that support it would suffer severe near-term losses. On the other hand, decontrol would be beneficial for employment in the petroleum and related industries.

The foreign policy and national/energy security implications of decontrol are not subject to precise quantification. ANS exports would improve the energy security of our allies in the Far East as well as create oil export opportunities for countries in the Western Hemisphere. Decontrol could, however, require offsetting oil imports from OPEC sources and thereby increase U.S. dependence on foreign suppliers.

B. RECOMMENDATION

Lifting the export ban on Alaskan North Slope (ANS) crude oil would result in short-term economic dislocations to certain sectors but could yield economic benefits over the long run. Specifically, lifting the export ban would have significant adverse consequences for the U.S. maritime industry and the industries that support it, as well as increase petroleum products prices for West Coast consumers.

At the same time, lifting the ban would enhance the efficiency of the U.S. energy distribution system and result in higher fiscal revenues for Federal and state authorities and increase oil industry profits.

An interagency review has been conducted of the analytical and technical findings of the study and the following is recommended: that the appropriate Federal agencies continue to review the prospects for Alaska North Slope exports, in light of changing energy market conditions. During this continuing review process, the appropriate Federal agencies will consult with the owners of the oil, including the State of Alaska, the maritime industry, and other interested parties.

APPENDIX A

ECONOMIC/ENERGY ASSUMPTIONS FOR THE ALASKAN 126 OIL STUDY

1. Scope/Timing

The Working Group has agreed to use 1985 as the base year. We believe that we can present an accurate estimate of preliminary data for 1985.

The Working Group also assumes that January 1, 1987 would serve as the effective date with respect to any Congressional action on the Alaskan oil situation. The plan is to take the study out to the year 2000, thereby providing a meaningful time span to measure the economic impact of alternative scenarios.

2. Oil Price

Table 1 shows the range of benchmark crude oil prices to be used in the study. For analysis requiring a point estimate, the group agreed to use mid-range values from the table. The world oil prices in the table are defined as the average imported refiner acquisition cost of crude oil delivered to the United States (IRAC). The range for the world oil price estimates was derived from a review of recent private and public sector world oil price projections.

The Valdez, Alaska prices in Table 1 are consistent with the range of world oil prices in the table minus: (1) a differential equal to average shipping costs to deliver Alaskan oil to U.S. refiners and, (2) a quality differential because Alaskan crude on average is of lower quality than the average imported barrel of crude oil.

In 1985, this difference equalled about \$4 per barrel. We project the future difference to remain at \$4 per barrel. We believe that the projected decline in shipping costs will be offset by a projected return to a larger quality differential of approximately \$0.50 per barrel.

TABLE 1
Crude Oil Price
(1985 per barrel)

	<u>1985 Estimated</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
World Oil Price <u>1/</u> (Range)	\$27	\$22-27	\$21-27	\$22-33	\$25-40
Valdez Alaska Crude <u>2/</u> (Range)	\$23	\$18-23	\$17-23	\$18-29	\$21-36

1 Defined as the imported average refiner acquisition cost of crude oil (IRAC).

2 Assumes continuation of prohibition on Alaskan crude oil exports.

3. GNP

The Working Group agreed to use the Administration's Mid-session 1985 numbers for the assumptions regarding economic growth. The assumptions were jointly prepared by the Department of the Treasury, the Council of Economic Advisers, and the Office of Management and the Budget. The assumptions only go to 1990, but the Working Group agreed to base 1991-2000 annual GNP growth on extrapolations of the past trends.

<u>Year</u>	<u>GNP Growth (%)</u>
1985	2.7
1986	4.2
1987	4.0
1988	4.0
1989	3.9
1990	3.6
1995	3.3
2000	3.0

4. Inflation

The Administration's current estimates of inflation are derived from the 1985 mid-session review. The inflation rate is necessary for calculating pipeline tariffs. The Administration's forecasts are for the 1985-1990 period. The Working Group has assumed a flat 3 percent annual inflation rate between 1991-2000.

The following are the inflation rates:

<u>Year</u>	<u>Percent</u>
1985	3.8
1986	4.1
1987	4.2
1988	3.9
1989	3.6
1990	3.3
1991-2000	3% annual inflation

5. TAPS Tariff

The Working Group believed that it was necessary to examine the pre-settlement and settlement pipeline tariffs. The current pipeline tariff is \$6 per barrel at approximately 1.8 million B/D throughput. We relied upon the Department of Justice to calculate the pipeline tariff under the terms of the settlement agreement between the North Slope producers and the Federal Government. Table 2 incorporates the range of pipeline throughput levels and the related pipeline tariff settlement rates. Each yearly tariff rate reflects an agreed upon pipeline throughput level (see Table 2).

TABLE 2
PIPELINE TARIFF
(\$1985)

<u>PIPELINE THROUGHPUT</u>			<u>PRE-SETTLEMENT TARIFF*</u>			<u>SETTLEMENT TARIFF</u>			
	<u>(MILLION B/D)</u>								
<u>YEAR</u>	<u>LOW</u>	<u>MIDPOINT</u>	<u>HIGH</u>	<u>LOW</u>	<u>MIDPOINT</u>	<u>HIGH</u>	<u>LOW</u>	<u>MIDPOINT</u>	<u>HIGH</u>
1985	-	1.8	--	-	6.00	--	-	5.04	--
1986	-	--	--	-	--	--	-	--	--
1987	-	1.8	--	-	6.00	--	-	4.35	--
1988	-	--	--	-	--	--	-	--	--
1989	-	--	--	-	--	--	-	--	--
1990	1.6	1.7	1.8	6.75	6.36	6.00	3.36	3.25	3.16
1991	-	--	--	-	--	--	-	--	--
1992	-	--	--	-	--	--	-	--	--
1993	-	--	--	-	--	--	-	--	--
1994	-	--	--	-	--	--	-	--	--
1995	1.3	1.55	1.8	8.31	6.97	6.00	2.25	2.05	1.98
1996	-	--	--	-	--	--	-	--	--
1997	-	--	--	-	--	--	-	--	--
1998	-	--	--	-	--	--	-	--	--
1999	-	--	--	-	--	--	-	--	--
2000	1.0	1.4	1.8	10.80	7.71	6.00	1.77	1.52	1.48

6. North Slope Crude Oil Production

After discussion, it was agreed to develop two oil production rates. The high and low production cases generally capture the most realistic scenarios for oil output.

The high case uses oil output of approximately 1.8 million B/D and holds this constant from 1985-2000. The high case reflects the upper bound of the range of production possibilities in DOE's National Energy Plan. The lower oil production scenario was derived from the Energy Information Administration's (EIA) forecast out to 1995. Production for the 1996-2000 period was extrapolated based upon the 1990-1995 period.

The Working Group recognizes that the low oil production case is somewhat more optimistic than the State of Alaska's Department of Revenue's current oil production forecasts. The Department of Revenue estimates crude oil production at 900,470 B/D in 1995 and 2000, respectively. There are three principal reasons for the different forecasts: (1) the Alaskan case assumes no improvement in oil field technical production and recovery techniques that are applied to the North Slope; (2) the Alaskan case shows no increases in production stemming from settlement of the pipeline tariff; and (3) the Alaskan case assumes that all recoverable reserves in Prudhoe Bay, including additional undiscovered but recoverable oil, are not developed during the 1990-2000 period. These are the major differences that account for the variance between the State of Alaska and the Working Group's estimates. The numbers breakout as follows:

Year	(Million B/D)		
	High	Mid-point	Low
1985	1.80	1.75	1.70
1987	1.80	1.75	1.70
1990	1.80	1.70	1.60
1995	1.80	1.55	1.30
2000	1.80	1.40	1.00

7. Shipping Rate (U.S.)

Table 3 incorporates numbers that reflect U.S. tanker charges for the Valdez to Gulf and West Coast trade routes.

The principal difference between the ranges is the magnitude of the decline in the U.S. tanker rate stemming from a recent MARAD policy change. Large U.S. tankers that repay the Construction Differential Subsidy (CDS) would now be allowed to enter the Alaskan trade on a full-time basis. DOT/MARAD believes that the employment of two to nine large tankers will result in a large reduction in U.S. tanker rates. The other end of the range of tanker rates represents a more conservative view regarding the magnitude and timing of the declines

in the freight rate. The following discussion explains the DOT methodology behind the forecasts of U.S. tanker rates.

o 1985:

- The 1985 shipping cost was derived by estimating the types and amount of shipping used over the first eight months of 1985, DOT staff estimates of current time charter rates, and DOT staff analysis of operating and voyage costs for different sized tankers. Added to this is a mid-range estimate of \$0.80 per barrel to use the Panama Pipeline system.

o 1987:

- The 1987 estimate is derived by simply assuming that there is a transition period before rates settle down to their lower level and that half the change in rates occurs by 1987.

o 1990-2000:

- Estimated shipping rates beyond 1990 are derived from an analysis of the expected shipping configuration after construction subsidy repayment on seven VLCCs that were previously precluded from full-time employment in the ANS trade. (This is possible because of a DOT rule issued last summer.) In this case, rates are lower because of: (1) greater use of the more efficient VLCCs instead of the less efficient smaller tankers; and (2) competitive pressure from the introduction of additional capacity drives time charter rates down to average break-even levels for each size class of ship.
- The high estimate assumes that the only changes to the fleet are the introduction of two ARCO tankers that have already repaid their construction subsidies and the two Exxon tankers that are currently under construction. It is also based upon the (unlikely) assumption that the introduction of this new tonnage into the trade has no impact on charter rates. This case accounts for the efficiency improvements from these four vessels but assumes that there are no competitive rate effects.
- The low estimate assumes full implementation of CDS repayment with the prepayment by seven VLCCs, plus introduction of the two Exxon vessels which are currently under construction. It also assumes that in response to this added capacity, time charter rates are driven to average break-even levels for each size class of vessels. It still does not consider the rate impacts that could result from various policy and structural changes.

TABLE 3
DOMESTIC SHIPPING RATES FOR ALASKA
NORTH SLOPE CRUDE OIL: 1985-2000
(\$1985 per barrel)

<u>Trade Route</u>		<u>1985</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Valdez-Gulf/East Coast*	High	--	3.87	3.75	3.75	3.75
	Medium	4.00	3.65	3.30	3.30	3.30
	Low	--	3.45	2.90	2.90	2.90
Valdez-West Coast	High	--	1.08	1.00	1.00	1.00
	Medium	1.15	1.02	0.87	0.87	0.87
	Low	--	0.94	0.73	0.73	0.73

* Includes \$0.80 per barrel Panama Pipeline System Cost

8. Trade Flows

The group agreed to a series of trade flows that are based upon the production scenarios. There will be a series of model runs involving export ban and export cases. The export ban and export cases will have high, medium and low freight rates and use the mid-point for oil production (see Table 2). The cases will be for 1987, 1990, 1995, and 2000.

Note: The Working Group also plans to address the impact of the new California to Texas crude oil pipeline on the trade flows. This line is slated to come onstream in 1986 and be eventually able to handle 300,000 B/D of throughput (see Section II of the report).

9. International Tanker Rates and Assumptions

International tanker rates are based on The Drewry Tanker Forecast-1985. H.P. Drewry has projected world tanker costs for representative tanker sizes through the year 2000. Tanker rates have also been projected for representative vessel sizes through 2000 based on Drewry's projections of international tanker supply and demand by vessel size categories. Future tanker rates for specific routes were obtained by multiplying Drewry's projected Worldscale (WS) freight rates for representative vessel sizes (adjusted for inflation) by the January 1, 1985 Worldscale 100 base rate for the routes applicable to the Section 126 Study.

o Tanker Cost Assumptions

- Tanker costs (expressed in 1985 dollars) have been estimated for the three major components: voyage (fuel and port), operating (manning, stores, lubes, maintenance and repairs, insurance, etc.), and capital. (See Table 4.)

o Voyage Costs

- Bunker fuel costs are assumed to fall between 1985 and 1987. In 1989 and 1990, bunker prices are assumed to grow by about 1 percent per year. Beyond 1990, bunker prices increase by about 2 percent per year.

Port charges are assumed to remain constant between 1985 and 2000.

o Operating Costs

- Vessel operating costs, in general, are assumed to remain constant between 1985 and 2000. However, manning costs are assumed to grow under 3 percent per year. (The growth in manning costs incorporates crew size reductions.)

o Capital Costs

- Capital costs are dependent on new building prices and financing terms. Future new building prices, in turn, are dependent on market conditions. Capital costs reflect changes in the supply and demand balance for the representative mix of ships employed on the routes provided in Table 4.

o Freight Rate Assumptions

- Estimated future spot tanker rates are provided in Table 4. Rates for the first four routes listed are based on a 50-50 mix of 120,000 DWT and 250,000 DWT tankers. Rates for the last two routes are based on a 50-50 mix of 80,000 DWT and 120,000 DWT tankers. The mix is an approximation of vessels actually employed on these routes.

TABLE 4
ESTIMATED WORLD SPOT TANKER RATES
(1985) DOLLARS PER BARREL
(Medium Estimate)

Route	1985	1987	1990	1995	2000
(1) Alaska-Japan	0.36	0.47	0.63	0.73	0.79
(2) Alaska-Virgin Islands	1.51	1.97	2.64	3.09	3.31
(3) Arabian Gulf-Japan	0.63	0.82	1.10	1.29	1.38
(4) Arabian Gulf-U.S. Gulf (rev.) 1/	1.10	1.37	1.78	2.04	2.17
(5) Arabian Gulf-U.S. East (rev.) 1/	1.61	1.90	2.10	2.54	2.67
(6) Far East-U.S. West Coast	1.17	1.43	1.61	2.01	2.12
(7) Arabian Gulf-U.S. West	1.72	2.10	2.36	2.93	3.11
(8) Arabian Gulf-Far East	0.36	0.47	0.63	0.73	0.79
(9) Arabian Gulf-N. Europe 1/	0.71	0.85	1.12	1.25	1.32
(10) Arabian Gulf-Italy 1/	0.55	0.63	0.83	0.90	0.95
(11) Arabian Gulf-Virgin Isl. 1/	1.02	1.27	1.65	1.88	2.00
(12) Arabian Gulf-Puerto Rico 1/	1.66	1.96	2.17	2.61	2.77
(13) Far East-Japan	0.57	0.69	0.78	0.96	1.02
(14) Arabian Gulf-Caribbean 1/	1.08	1.34	1.75	2.00	2.13

1/ Includes Suez Canal Toll which varies by vessel size and not by market freight rate:

Arabian Gulf-U.S. Gulf	\$0.19/ BBL
Arabian Gulf-U.S. East	\$0.29/ BBL
Arabian Gulf-N. Europe	\$0.19/ BBL
Arabian Gulf-Italy	\$0.19/ BBL
Arabian Gulf-Virgin Isl.	\$0.19/ BBL
Arabian Gulf-Puerto Rico	\$0.29/ BBL
Arabian Gulf-Caribbean	\$0.19/ BBL

TABLE 4 (Cont'd)

ESTIMATED WORLD SPOT TANKER RATES

(1985) DOLLARS PER BARREL

(High Estimate)

Route	1985	1987	1990	1995	2000
(1) Alaska-Japan	0.36	0.54	0.72	0.83	0.90
(2) Alaska-Virgin Islands	1.51	2.27	3.04	3.55	3.80
(3) Arabian Gulf-Japan	0.63	0.94	1.27	1.48	1.58
(4) Arabian Gulf-U.S. Gulf (rev.) 1/	1.10	1.58	2.05	2.34	2.50
(5) Arabian Gulf-U.S. East (rev.) 1/	1.61	2.19	2.42	2.92	3.06
(6) Far East-U.S. West Coast	1.17	1.64	1.85	2.31	2.43
(7) Arabian Gulf-U.S. West	1.72	2.42	2.71	3.36	3.57
(8) Arabian Gulf-Far East	0.36	0.54	0.72	0.84	0.90
(9) Arabian Gulf-W. Europe 1/	0.71	0.98	1.29	1.43	1.51
(10) Arabian Gulf-Italy 1/	0.55	0.72	0.95	1.03	1.09
(11) Arabian Gulf-Virgin Isl. 1/	1.02	1.46	1.90	2.16	2.30
(12) Arabian Gulf-Puerto Rico 1/	1.66	2.25	2.50	3.00	3.19
(13) Far East-Japan	0.57	0.79	0.90	1.10	1.17
(14) Arabian Gulf-Caribbean 1/	1.08	1.54	2.01	2.29	2.45

TABLE 4 (Cont'd)

ESTIMATED WORLD SPOT TANKER RATES

(1985) DOLLARS PER BARREL

(Low Estimate)

Route	1985	1987	1990	1995	2000
(1) Alaska-Japan	0.36	0.40	0.54	0.62	0.67
(2) Alaska-Virgin Islands	1.51	1.67	2.24	2.62	2.81
(3) Arabian Gulf-Japan	0.63	0.70	0.94	1.10	1.17
(4) Arabian Gulf-U.S. Gulf (rev.) 1/	1.10	1.16	1.51	1.73	1.84
(5) Arabian Gulf-U.S. East (rev.) 1/	1.61	1.62	1.79	2.16	2.27
(6) Far East-U.S. West Coast	1.17	1.22	1.37	1.70	1.80
(7) Arabian Gulf-U.S. West	1.72	1.79	2.01	2.49	2.64
(8) Arabian Gulf-Far East	0.36	0.40	0.54	0.62	0.67
(9) Arabian Gulf-N. Europe 1/	0.71	0.72	0.95	1.06	1.12
(10) Arabian Gulf-Italy 1/	0.55	0.54	0.71	0.76	0.81
(11) Arabian Gulf-Virgin Isl. 1/	1.02	1.08	1.40	1.60	1.70
(12) Arabian Gulf-Puerto Rico 1/	1.66	1.67	1.84	2.22	2.35
(13) Far East-Japan	0.57	0.59	0.66	0.82	0.87
(14) Arabian Gulf-Caribbean 1/	1.08	1.14	1.49	1.70	1.81

APPENDIX B

DOMESTIC SHIPPING RATES

1. Estimation of Tanker Rates

A major determinant of shipping rates is vessel size. Large tankers transport crude at a lower cost per unit than do small tankers because operating costs do not increase proportionately as cargo volumes increase. The relative efficiency of larger tankers becomes even more pronounced over longer hauls. For example, a 37,500 DWT tanker has operating expenses per barrel mile (excluding fuel costs, terminal charges, and fixed costs) over four-and-a-half times that of a 250,000 DWT tanker (18.5 cents versus 4.4 cents per 1,000 barrel miles). An 80,000 DWT tanker is almost three times more costly to operate than a 250,000 DWT vessel.

Our estimates of current and projected ANS crude oil shipping rates consider the size and type of vessel employed in each trade. By averaging the high and low estimates, we have generated a "middle" estimate. Our estimates are based on the assumption that the number and size distribution of the ships currently operating in the ANS trade remains constant.

An implicit assumption in our analysis is that the average efficiency of replacement vessels will remain unchanged over time. We also assume that the average rate of the Panama Pipeline remains the same throughout the study period. Pipeline charges now range from \$0.60-\$1.00 per barrel. We use an average \$0.80 per barrel for the entire forecast period.

Finally, no consideration is given to any possible impact on rates of the opening of a California to Texas crude oil pipeline. If such a pipeline were to be built and were to divert shipments from Panama to the West Coast for transshipment to Texas, there would be a significant decrease in the demand for tanker capacity. For example, the diversion of 200,000 B/D from trans-Panama shipments to the new pipeline would decrease the amount of shipping capacity needed by about 1.4 million DWT (about a fourth of the tanker capacity that was used in 1985). This would have a negative impact on rates.

o 1985 Rates

Shipping costs for 1985 were derived by considering the type and number of vessels deployed during the first eight months of 1985, estimating operating and voyage costs for tankers of different sizes. As mentioned, we also add \$0.80 per barrel for the use of the Panama Pipeline. Based on this methodology, we estimate that in 1985, the average cost to

ship ANS crude to the Gulf was \$4.00 per barrel (\$1.00 to \$1.50 less than it was in 1981) and that it cost about \$1.15 to ship oil from Alaska to the West Coast (down from \$1.50 in 1981).

o 1987 Rates

Since we expect ANS shipping rates to decline, our 1987 estimates were derived by assuming that it takes some period before rates decline and that half of this reduction occurs by 1987.

o 1990-2000 Rates

Our forecasts of shipping rates beyond 1990 were derived from analyzing the effect of allowing seven VLCCs built with CDS assistance to enter the ANS trade on a full-time basis. Rates decline because of the greater use of the more efficient VLCCs and the competitive consequences of introducing additional capacity. The high estimate of \$3.75 per barrel to the Gulf Coast and \$1.00 to the West Coast is based on the assumption that the two Arco tankers that have already repaid their construction subsidies and the two Exxon tankers that are currently under construction are the only vessels that enter the trades. The high estimate is also based on the assumption that the introduction of these vessels would have no impact on charter rates.

The low estimate of \$2.90 per barrel to the Gulf Coast and \$0.73 to the West Coast assumes full implementation of CDS repayment (i.e., payment by seven VLCCs) plus the introduction of the two Exxon vessels. We also assume that in response to this added capacity, time charter rates fall to break-even levels.

2. Types of Charter Arrangements

Ship charters range from a single voyage to the life of the vessel. A single voyage or "spot" charter, is one in which the ship owner agrees to use a specific vessel to transport a fixed amount of oil for a fixed fee. The owner of the vessel provides the vessel, crew, and appropriate stores. All costs associated with making the voyage are borne by the vessel owner, including port, fuel, and canal charges.

Time charters range from a few days to the vessel's life. Under a time charter, the vessel owner agrees to provide a seaworthy vessel, crew, and appropriate stores, and agrees to make all insurance and maintenance payments. The charterer is responsible for paying fuel,

port, canal, and any other voyage costs. Even if the vessel is not fully employed, the charterer is obligated to comply with the terms of the contract.

Bareboat charters, a form of time charter, generally extend over the life of the vessel. The vessel owner is responsible for providing a seaworthy vessel. The charterer is responsible for insurance, maintenance and repairs, crew, and appropriate stores, as well as voyage costs (e.g., fuel, port charges, canal fees).

APPENDIX C

METHODOLOGY

1. Return to the Producer and Equivalent Valdez F.O.B.

For this analysis, it was assumed that the incentives to produce were the same under two different scenarios if the return to the producer (wellhead price minus royalties, severance tax, and WPT) was the same under both scenarios. Due to the complex structure of oil producing companies, this assumption may not be valid, but it can be made for purposes of approximation. So that existing estimates of supply elasticity could be used, the equivalent wellhead price was calculated for each policy option. That is, the wellhead price yields the same return to the producer as does implementing the policy option.

For analysis of the TAPS tariff settlement (Table 4) the base case assumed the old (pre-settlement) tariffs. It is difficult to predict what the TAPS tariffs would be in the future in the absence of a settlement. At the suggestion of the Department of Justice, the future pre-settlement tariffs were calculated which would provide the pipeline owners with constant gross revenues. The new (settlement) tariffs were used for the base case for all other policy options because adoption of the settlement seems likely. Mid-point Valdez F.O.B. prices were used for the base case for all policy options except exemption from WPT. The impact of exemption from WPT is sensitive to original price because under mid-point and low price assumptions, the wellhead price does not exceed the base price. Only if prices turn out to be high will any Windfall Profit Taxes be owed. For the other policy options, the ratio between equivalent wellhead price and original wellhead price, and therefore the supply response, was relatively insensitive to the choice of base case Valdez F.O.B. price. The WPT was assumed to phase out between 1990 and 1995.

2. Supply Response

While there is general agreement that an increase in the wellhead crude price will induce a higher level of crude production than would otherwise occur, the amount and timing of the response is uncertain and subject to debate. A common method of quantifying an oil production response is with an oil supply elasticity (i.e., the percentage increase in production for a one percent increase in price). Experts have estimated such oil supply elasticities in the 0.3 to 0.4 range, which is by definition inelastic. Since price effects are cumulative and there are delays between exploration and actual production, these elasticities are not assumed to reach their full value until after 15 years from the initial price change.

Table A-1 shows the range of crude oil supply elasticities for Alaska North Slope crude oil production used in this study. The elasticities were chosen to be consistent with other studies and expert opinion.

TABLE A-1ALASKA NORTH SLOPE SUPPLY ELASTICITIES
(Dimensionless)

<u>Elasticity</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Low	negl.	0.00	0.05	0.10
Medium	negl.	0.025	0.10	0.20
High	negl.	0.05	0.15	0.30

Table A-2 gives the range of elasticities for California crude oil production.

TABLE A-2CALIFORNIA SUPPLY ELASTICITIES
(Dimensionless)

<u>Elasticity</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Low	negl.	0.00	0.10	0.20
Medium	negl.	0.05	0.15	0.30
High	negl.	0.10	0.20	0.40

The elasticity in any year is assumed constant over a range of price and production levels according to the equation:

$$e_t = \frac{dQ/Q_0}{dP/P_0}$$

where

e_t = elasticity in year t
 dQ = change in oil production
 Q_0 = base case oil production
 dP = change in wellhead price
 P_0 = base case wellhead price

The elasticities in Table A-1 are assumed to start from essentially zero in 1987 (the first year of the price change) and to increase to a maximum in the year 2000. The increase in elasticity over time reflects the view that the increase in production in response to a change in price will be greater if that increase was expected for a long time. The initial response to an increase in the incentives to produce is to increase production from existing wells. Over time, new wells are drilled in response to the increase in profitability. Eventually, increased exploration activity results in new fields being discovered. However, in the Arctic, development of a new field takes about 15 years. Since this study only goes out 13 years (1987 to 2000), the elasticities are assumed not to reach 0.3 to 0.4 by 2000. Also, we assumed that the harsh operating conditions in Alaska make the elasticities smaller for that region than for the national average. Given these considerations, the elasticities in Table A-1 should be viewed as a reasonable but somewhat conservative estimate of the possible production response for Alaska North Slope crude production.

The elasticities in California are assumed slightly higher than in Alaska because of the more favorable operating conditions and the potential for enhanced oil recovery of heavy California crude oils.

3. Base Case and Policy Option Calculations

Tables 1 through 3 show the three base cases used in the calculation of equivalent Valdez F.O.B. and the supply response from each policy option. Tables 4 through 7 show the calculations for each policy option. The following equations are used in the tables:

$$\text{Pipeline Loss} = \text{Valdez F.O.B.} * 0.003$$

$$\text{Royalty} = \text{Wellhead Price} * \text{Royalty Rate}$$

$$\text{Severance} = (\text{Wellhead Price} - \text{Royalty}) * \text{Severance Rate}$$

$$\text{WPT} = (\text{Wellhead Price} - 17.85) * (1 - \text{Severance Rate}) * (1 - \text{Royalty Rate}) * \text{WPT Rate}$$

$$\text{Wellhead Ratio} = \text{Equiv. Wellhead Price} / \text{Orig. Wellhead Price}$$

$$\text{Supply Response (\%)} = (\text{Wellhead Ratio})^{\text{A Elasticity}} - 1$$

$$\text{Supply Response (MBD)} = \text{Supply Response (\%)} * \text{Amount of oil affected}$$

4. Estimation of Labor Impacts

To estimate the employment effects in SIC 13 for each policy option analyzed in section A, it is assumed for simplicity that oil and gas extraction employment is proportional to production. There are a wide variety of reasons why this assumption may not be correct, although the direction of bias is uncertain.

ANS oil production and employment for the Anchorage and Northern Labor Market Areas in the absence of policy changes are shown below:

ESTIMATED ANS OIL RELATED PRODUCTION
AND EMPLOYMENT IN SIC 13

	<u>Production</u>	<u>Employment</u>
1987	1.8 MMBO	7,627 workers
1990	1.7	7,203
1995	1.55	6,567
2000	1.4	5,931

Estimated ANS oil production figures are mid-points of the ranges which are used throughout this study. Employment estimates are derived from a 1984 employment base and assume that employment will decline over time in proportion to the amount of oil produced. Employment effects of implementing policy options are obtained by multiplying the percentage increase in production due to the policy option by the employment level in that year.

Increased incentives for ANS oil production, with the export ban in place, should lead to only a small increase in ANS oil shipments on U.S. flag tankers relative to existing levels. Given the small magnitude of the increase, it is reasonable to assume that the structure of ANS oil shipping will not be changed by any of the policy options considered. In particular, proportions shipped along the various tanker routes - Valdez to West Coast, Valdez to Panama, Panama to Gulf and East Coasts and Puerto Rico - should not be affected. Also, average tanker size on each route should remain the same. It is possible that proportions shipped along different routes and average tanker size may change over time anyway. It is important to emphasize that no adjustment has been made for such changes for purposes of estimating employment effects. The bias introduced by failing to account for structural change in shipping is expected to be small.

Employment effects of a policy option are estimated by allocating the total ANS crude oil supply increase to different shipping routes using the 1984 proportion of ANS crude oil shipments on that route (1984 is the last year for which complete data are available):

1984 ANS CRUDE OIL SHIPMENTS
(percent of total)

Valdez to:

West Coast	58%
Gulf and East Coasts and Puerto Rico (through Panama)	35%
Virgin Islands	<u>7%</u>
Total:	100%

Source: U.S. Maritime Administration

It should be noted that 1984 shipments to the Virgin Islands were not carried on U.S. flag tankers. Also, shipments directly from Valdez to the Gulf and East Coasts are ignored for simplicity.

To estimate the employment effects, shipments by route are multiplied by 1984 conversion factors for each route to obtain the required increases in tanker fleet size, measured in deadweight tons (DWT), for each route:

1984 CONVERSION FACTORS

<u>Trade Route</u>	<u>Conversion Factor</u> (DWT/barrel per day)
Valdez to West Coast	1.986
<u>Trade Route</u>	<u>Conversion Factor</u> (DWT/barrel per day)
Valdez to Panama	4.712
Panama to:	
Gulf and East Coasts	2.084
Puerto Rico	1.557

Source: U.S. Maritime Administration

To convert ANS oil shipments from Panama to the Gulf and East Coasts and Puerto Rico into deadweight tonnage, an upper bound conversion factor of 2.084 was used. This causes employment effects to be overstated and they should be interpreted as upper bounds.

Next, increases in deadweight tonnage are multiplied by 1984 ratios of seafaring employment to deadweight tonnage for each route using data supplied by the U.S. Maritime Administration and presented in Tables H-2 and H-3 of Section II. As noted previously, these data show number of seafarers and deadweight tonnage for tankers in the ANS oil trade as of January 1984. Translating changes in deadweight tonnage into changes in seafaring employment for each route is

justified as follows. First, the number of seafarers per tanker is approximately the same regardless of tanker size, as shown in Section II-H. Also, the average tanker size on each route is assumed not to change as a result of increased ANS crude oil production incentives. Therefore, the percentage increase in seafaring employment will be approximately equal to the percentage increase in deadweight tonnage along each route. The final step used to obtain seafaring employment increases is to add across the different trade routes.

5. Base Case and Policy Option TablesTABLE 1BASE CASE 1 - OLD (PRE-SETTLEMENT) TARIFFS AND
MID-POINT VALDEZ F.O.B. PRICES

	<u>RATE</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
VALDEZ F.O.B.		20.50	20.00	23.50	28.50
Less:					
PIPELINE LOSS		0.06	0.06	0.07	0.09
PIPELINE TARIFF		<u>6.00</u>	<u>6.36</u>	<u>6.97</u>	<u>7.71</u>
WELLHEAD PRICE		14.44	13.58	16.46	20.70
Less:					
ROYALTY	0.125	1.80	1.70	2.06	2.59
SEVERANCE	0.150	1.90	1.78	2.16	2.72
WPT	<u>0.700</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
RETURN		10.74	10.10	12.24	15.40

TABLE 2

BASE CASE 2 - NEW (SETTLEMENT) TARIFFS AND
MID-POINT VALDEZ F.O.B. PRICES

	<u>RATE</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
VALDEZ F.O.B.		20.50	20.00	23.50	28.50
Less:					
PIPELINE LOSS		0.06	0.06	0.07	0.09
PIPELINE TARIFF		<u>4.35</u>	<u>3.25</u>	<u>2.05</u>	<u>1.52</u>
WELLHEAD PRICE		16.09	16.69	21.38	26.89
Less:					
ROYALTY	0.125	2.01	2.09	2.67	3.36
SEVERANCE	0.150	2.11	2.19	2.81	3.53
WPT	<u>0.700</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
RETURN		11.97	12.41	15.90	20.00

TABLE 3
BASE CASE 3 - NEW (SETTLEMENT) TARIFFS AND
HIGH VALDEZ F.O.B. PRICES

	<u>RATE</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
VALDEZ F.O.B.		23.00	23.00	29.00	36.00
Less:					
PIPELINE LOSS		0.07	0.07	0.09	0.11
PIPELINE TARIFF		<u>4.35</u>	<u>3.25</u>	<u>2.05</u>	<u>1.52</u>
WELLHEAD PRICE		18.58	19.68	26.86	34.37
Less:					
ROYALTY	0.125	2.32	2.46	3.36	4.30
SEVERANCE	0.150	2.44	2.58	3.53	4.51
WPT	0.700	<u>0.38</u>	<u>0.95</u>	<u>0.00</u>	<u>0.00</u>
RETURN		13.44	13.68	19.98	25.56

TABLE 4CALCULATIONS FOR TARIFF SETTLEMENT
COMPARED WITH BASE CASE 1

	<u>RATE</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>WITH NEW (SETTLEMENT) TARIFFS</u>					
VALDEZ F.O.B.		20.50	20.00	23.50	28.50
Less:					
PIPELINE LOSS		0.06	0.06	0.07	0.09
PIPELINE TARIFF		<u>4.35</u>	<u>3.25</u>	<u>2.05</u>	<u>1.52</u>
WELLHEAD PRICE		16.09	16.69	21.38	26.89
<u>BASE CASE</u>					
VALDEZ F.O.B.		20.50	20.00	23.50	28.50
Less:					
PIPELINE LOSS		0.06	0.06	0.07	0.09
PIPELINE TARIFF		<u>6.00</u>	<u>6.36</u>	<u>6.97</u>	<u>7.71</u>
WELLHEAD PRICE		14.44	13.58	16.46	20.70
<u>IMPACT ON WELLHEAD PRICE</u>					
WELLHEAD DIFFERENCE		1.65	3.11	4.92	6.19
WELLHEAD RATIO		1.114	1.229	1.299	1.299
<u>SUPPLY RESPONSE</u>					
AMOUNT OF OIL AFFECTED (MBD)		1,800	1,700	1,550	1,400
LOW ELASTICITY		0	0	0.05	0.1
%		0.00%	0.00%	1.32%	2.65%
QUANTITY (MBD)		0.0	0.0	20.4	37.1
MID ELASTICITY		0	0.025	0.1	0.2
%		0.00%	0.52%	2.65%	5.37%
QUANTITY (MBD)		0.0	8.8	41.1	75.2
HIGH ELASTICITY		0	0.05	0.15	0.3
%		0.00%	1.04%	4.00%	8.16%
QUANTITY (MBD)		0.0	17.6	62.0	114.3

TABLE 5a

CALCULATIONS FOR REDUCING ROYALTY RATE BY 25%
COMPARED WITH BASE CASE 2

	<u>RATE</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>WITH ROYALTY RATE REDUCED 25%</u>					
VALDEZ F.O.B.		20.50	20.00	23.50	28.50
Less:					
PIPELINE LOSS		0.06	0.06	0.07	0.09
PIPELINE TARIFF		<u>4.35</u>	<u>3.25</u>	<u>2.05</u>	<u>1.52</u>
WELLHEAD PRICE		16.09	16.69	21.38	26.89
Less:					
ROYALTY	0.094	1.51	1.56	2.00	2.52
SEVERANCE	0.150	2.19	2.27	2.91	3.66
WPT	0.700	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
RETURN		12.39	12.86	16.47	20.72
<u>EQUIVALENT WELLHEAD PRICE</u>					
WELLHEAD PRICE		16.66	17.29	22.15	27.86
Less:					
ROYALTY	0.125	2.08	2.16	2.77	3.48
SEVERANCE	0.150	2.19	2.27	2.91	3.66
WPT	0.700	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
RETURN		12.39	12.86	16.47	20.72
<u>EQUIVALENT WELLHEAD PRICE INCREASE</u>					
WELLHEAD DIFFERENCE		0.57	0.60	0.77	0.97
WELLHEAD RATIO		1.036	1.036	1.036	1.036
<u>SUPPLY RESPONSE</u>					
AMOUNT OF OIL		negl.	negl.	negl.	negl.
AFFECTED (MBD)					
LOW ELASTICITY		0	0	0.05	0.1
%		0.00%	0.00%	0.18%	0.35%
QUANTITY (MBD)		negl.	negl.	negl.	negl.
MID ELASTICITY		0	0.025	0.1	0.2
%		0.00%	0.09%	0.35%	0.71%
QUANTITY (MBD)		negl.	negl.	negl.	negl.
HIGH ELASTICITY		0	0.05	0.15	0.3
%		0.00%	0.18%	0.53%	1.06%
QUANTITY (MBD)		negl.	negl.	negl.	negl.

TABLE 5b

CALCULATIONS FOR REDUCING ROYALTY RATE BY 50%
COMPARED WITH BASE CASE 2

	<u>RATE</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>WITH ROYALTY RATE REDUCED 50%</u>					
VALDEZ F.O.B.		20.50	20.00	23.50	28.50
Less:					
PIPELINE LOSS		0.06	0.06	0.07	0.09
PIPELINE TARIFF		<u>4.35</u>	<u>3.25</u>	<u>2.05</u>	<u>1.52</u>
WELLHEAD PRICE		16.09	16.69	21.38	26.89
Less:					
ROYALTY	0.063	1.01	1.04	1.34	1.68
SEVERANCE	0.150	2.26	2.35	3.01	3.78
WPT	0.700	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
RETURN		12.82	13.30	17.04	21.43
<u>EQUIVALENT WELLHEAD PRICE</u>					
WELLHEAD PRICE		17.24	17.95	22.91	28.81
Less:					
ROYALTY	0.125	2.16	2.24	2.86	3.60
SEVERANCE	0.150	2.26	2.36	3.01	3.78
WPT	0.700	<u>0.00</u>	<u>0.05</u>	<u>0.00</u>	<u>0.00</u>
RETURN		12.82	13.30	17.04	21.43

EQUIVALENT WELLHEAD PRICE INCREASE

WELLHEAD DIFFERENCE	1.15	1.26	1.53	1.92
WELLHEAD RATIO	1.072	1.075	1.072	1.071

SUPPLY RESPONSE

AMOUNT OF OIL AFFECTED (MBD)	negl.	negl.	negl.	negl.
LOW ELASTICITY	0	0	0.05	0.1
%	0.00%	0.00%	0.35%	0.69%
QUANTITY (MBD)	negl.	negl.	negl.	negl.
MID ELASTICITY	0	0.025	0.1	0.2
%	0.00%	0.18%	0.69%	1.39%
QUANTITY (MBD)	negl.	negl.	negl.	negl.
HIGH ELASTICITY	0	0.05	0.15	0.3
%	0.00%	0.36%	1.04%	2.09%
QUANTITY (MBD)	negl.	negl.	negl.	negl.

TABLE 6a

CALCULATIONS FOR REDUCING SEVERANCE TAX RATE BY 25%
COMPARED WITH BASE CASE 2

	RATE	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>WITH SEVERANCE TAX RATE REDUCED 25%</u>					
VALDEZ F.O.B.		20.50	20.00	23.50	28.50
Less:					
PIPELINE LOSS		0.06	0.06	0.07	0.09
PIPELINE TARIFF		<u>4.35</u>	<u>3.25</u>	<u>2.05</u>	<u>1.52</u>
WELLHEAD PRICE		16.09	16.69	21.38	26.89
Less:					
ROYALTY	0.125	2.01	2.09	2.67	3.36
SEVERANCE	0.113	1.58	1.64	2.10	2.65
WPT	0.700	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
RETURN		12.49	12.96	16.60	20.89
<u>EQUIVALENT WELLHEAD PRICE</u>					
WELLHEAD PRICE		16.80	17.43	22.32	28.09
Less:					
ROYALTY	0.125	2.10	2.18	2.79	3.51
SEVERANCE	0.150	2.21	2.29	2.93	3.69
WPT	0.700	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
RETURN		12.50	12.96	16.60	20.89
<u>EQUIVALENT WELLHEAD PRICE INCREASE</u>					
WELLHEAD DIFFERENCE		0.71	0.74	0.94	1.20
WELLHEAD RATIO		1.044	1.044	1.044	1.044
<u>SUPPLY RESPONSE</u>					
AMOUNT OF OIL AFFECTED (MBD)		1,800	1,700	1,550	1,400
LOW ELASTICITY		0	0	0.05	0.1
%		0.00%	0.00%	0.22%	0.44%
QUANTITY (MBD)		0.00	0.00	3.3	6.1
MID ELASTICITY		0	0.025	0.1	0.2
%		0.00%	0.11%	0.43%	0.87%
QUANTITY (MBD)		0.00	1.8	6.7	12.2
HIGH ELASTICITY		0	0.05	0.15	0.3
%		0.00%	0.22%	0.65%	1.31%
QUANTITY (MBD)		0.00	3.7	10.0	18.4

TABLE 6b

CALCULATIONS FOR REDUCING SEVERANCE TAX RATE BY 50%
COMPARED WITH BASE CASE 2

	RATE	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>WITH SEVERANCE TAX RATE REDUCED 50%</u>					
VALDEZ F.O.B.		20.50	20.00	23.50	28.50
Less:					
PIPELINE LOSS		0.06	0.06	0.07	0.09
PIPELINE TARIFF		<u>4.35</u>	<u>3.25</u>	<u>2.05</u>	<u>1.52</u>
WELLHEAD PRICE		16.09	16.69	21.38	26.89
Less:					
ROYALTY	0.125	2.01	2.09	2.67	3.36
SEVERANCE	0.075	1.06	1.10	1.40	1.76
WPT	0.700	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
RETURN		13.02	13.51	17.30	21.77
<u>EQUIVALENT WELLHEAD PRICE</u>					
WELLHEAD PRICE		17.50	18.88	23.26	29.27
Less:					
ROYALTY	0.125	2.19	2.36	2.91	3.66
SEVERANCE	0.150	2.30	2.48	3.05	3.84
WPT	0.700	<u>0.00</u>	<u>0.54</u>	<u>0.00</u>	<u>0.00</u>
RETURN		13.02	13.51	17.30	21.77
<u>EQUIVALENT WELLHEAD PRICE INCREASE</u>					
WELLHEAD DIFFERENCE		1.41	2.19	1.88	2.38
WELLHEAD RATIO		1.088	1.131	1.088	1.088
<u>SUPPLY RESPONSE</u>					
AMOUNT OF OIL AFFECTED (MBD)		1,800	1,700	1,550	1,400
LOW ELASTICITY		0	0	0.05	0.1
%		0.00%	0.00%	0.42%	0.85%
QUANTITY (MBD)		0.00	0.00	6.5	11.9
MID ELASTICITY		0	0.025	0.1	0.2
%		0.00%	0.31%	0.85%	1.71%
QUANTITY (MBD)		0.00	5.2	13.1	23.9
HIGH ELASTICITY		0	0.05	0.15	0.3
%		0.00%	0.62%	1.27%	2.57%
QUANTITY (MBD)		0.00	10.5	19.7	36.0

TABLE 7

CALCULATIONS FOR EXEMPTION FROM WPT (HIGH PRICES)
COMPARED WITH BASE CASE 3

	<u>RATE</u>	<u>1987</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>WITH ANS OIL EXEMPT FROM WPT</u>					
VALDEZ F.O.B. (HIGH)		23.00	23.00	29.00	36.00
Less:					
PIPELINE LOSS		0.07	0.07	0.09	0.11
PIPELINE TARIFF		<u>4.35</u>	<u>3.25</u>	<u>2.05</u>	<u>1.52</u>
WELLHEAD PRICE		18.58	19.68	26.86	34.37
Less:					
ROYALTY	0.125	2.32	2.46	3.36	4.30
SEVERANCE	0.150	2.44	2.58	3.53	4.51
WPT	0.000	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
RETURN		13.82	14.64	19.98	25.56
<u>EQUIVALENT WELLHEAD PRICE</u>					
WELLHEAD PRICE		20.28	23.98	26.86	34.37
Less:					
ROYALTY	0.125	2.54	3.00	3.36	4.30
SEVERANCE	0.150	2.66	3.15	3.53	4.51
WPT	0.700	<u>1.27</u>	<u>3.19</u>	<u>0.00</u>	<u>0.00</u>
RETURN		13.82	14.64	19.98	25.56
<u>EQUIVALENT WELLHEAD PRICE INCREASE</u>					
WELLHEAD DIFFERENCE		1.70	4.30	(0.00)	(0.00)
WELLHEAD RATIO		1.091	1.218	1.000	1.000
<u>SUPPLY RESPONSE</u>					
AMOUNT OF OIL AFFECTED (MBD)		1,520	1,050		
LOW ELASTICITY		0	0		
%		0.00%	0.00%		
QUANTITY (MBD)		0.0	0.0		
MID ELASTICITY		0	0.025		
%		0.00%	0.50%		
QUANTITY (MBD)		0.0	5.2		
HIGH ELASTICITY		0	0.05		
%		0.00%	0.99%		
QUANTITY (MBD)		0.0	10.4		

APPENDIX D

DESCRIPTION OF DOE OIL TRADE MODEL

The Oil Trade Model (OTM) simulates international petroleum production, transportation, and refining. Using a non-linear optimization technique, the model maximizes the sum of producers' and consumers' surplus, given supply and demand functions and various constraints on the system. The model can be used to investigate the effects of government policy and international events on crude and product supplies, demand, prices, and flows. The model incorporates refining costs, refinery technology, shipping costs, taxes, subsidies, and distribution costs into the analysis.

The model simulates the international petroleum system with:

- 15 crude oil supply regions
- 15 refining regions
- 15 product demand regions
- 6 transshipment points for crudes

- 15 crude oils (differentiated by gravity and sulfur content)
- 3 intermediate products (shipped among refining regions)

- 6 refined products (including high sulfur resid, low sulfur resid, distillates, gasoline, and naphtha)

- 100 refinery technologies
- 20 refinery constraints (capacities, material, etc.)

- 9 transport modes
- 12 quantity constraints on transport variables

OTM contains a non-linear objective function but its constraints are linear. The objective function contains both linear and non-linear terms. The linear terms are defined by refining and transportation costs. The non-linear terms are the product demand and crude supply functions.

Demand curves are specified for each product and region. Each curve is described by three parameters: a "reference" price and quantity, and constant price elasticity of demand. Supply curves are specified for each crude oil type and supply region.

The model's constraints may be interpreted as availability limits. The constraints maintain material balances, as well as specify refinery and transportation capacities. The refinery technology parameters specify the mix of products that are available. Other parameters can be introduced to model stockpile releases or accumulation of crude or products, net imports from the Centrally Planned Economies, and import quotas.

The output of the model is a complete description of the international petroleum sector. The data shows:

- o how much crude is produced in each region;
- o where and how each crude is transported for refining;
- o which refining technologies are used at what levels;
- o where and how products are shipped to demand regions;
- o consumption of products in demand regions;
- o prices of all crudes and products;
- o shadow prices of refinery capacities, transport capacities, crude producibility, etc.

For more detailed information, see A.S. Manne and K.C. So, "International Oil Trade Model: A User's Guide to OTM," Stanford University, March 1984.

APPENDIX E

SUMMARY OF FEDERAL REGISTER NOTICE COMMENTS

1. Introduction

On December 9, 1985, the Office of Industrial Resource Administration, U.S. Department of Commerce, published in the Federal Register a request for comments on the Alaskan North Slope crude oil study. This study, mandated by Congress in the Export Administration Amendments Act of 1985, required a review of issues concerning:

- o "possible changes in the existing incentives to produce crude oil from the Alaskan North Slope; and
- o "possible changes in the existing distribution of crude oil from the North Slope of Alaska and the appropriateness of continuing existing controls."

Thirty-four comments arguing either for or against the export of ANS crude oil were received from various members of the petroleum producing and refining industries, the transportation and engineering industries, labor organizations, and concerned citizens. Almost all of these comments focused on exporting Alaskan North Slope (ANS) crude oil rather than possible changes in the existing incentives to produce ANS crude oil.

The key issues raised by the parties commenting on this study involved the various impacts of lifting the export ban on Alaskan crude oil. These impacts encompassed the following areas: (1) exploration and production, (2) Federal and State revenues, (3) the refining industry, (4) consumers, (5) employment, (6) the shipping industry, (7) U.S. trade policy, (8) U.S. foreign policy, and (9) national security.

2. Exploration and Development

Many parties, both those in favor and those opposed to lifting the ban, addressed the impact on new petroleum development of allowing ANS crude exports. All parties agreed that by allowing ANS exports, the wellhead value of ANS crude would rise. Estimates of the wellhead price increase ranged from \$1-3 barrel. The parties disagreed, however, regarding the impact of higher wellhead prices on new Alaskan development.

Before discussing some of the parties' comments, it is interesting to observe that none of the parties provided specific estimates of the production increases resulting from a lifting of the ban. This fact apparently stems from the long lead times required to develop Alaskan oil (10-15 years), uncertainty about the quantity and quality of future lease acreage, and uncertainty about the future world oil price.

These factors made various parties reluctant to venture estimates of future production.

Just as all parties agreed that lifting the export ban would result in higher wellhead prices, the parties were pretty much in agreement that ANS production would begin to decline during the 1990s. In its comments, the State of Alaska presented estimate, by the Department of Revenue showing oil production declining from the approximately 1.8 million barrels per day (MMB/D) current level to 0.9 MMB/D by 1995. Exxon, which opposes lifting the ban, also cited the Alaskan estimate as a reliable indicator of the prospects for declining crude oil production.

The basic argument of the advocates for lifting the ban was that exporting oil to the Pacific Basin rather than sending it through the Panama Canal to the Gulf Coast results in a \$2.50-3.00 per barrel transportation savings. This savings is then transferred to the producers. The incremental revenue, after allowing for the deduction of Federal and State of Alaska tax revenues, could then be used for new exploration and development. Advocates of lifting the ban (such as the State of Alaska, Conoco, Amoco and the Yukon Pacific Corporation) all argue that this would result in new production that would not occur if the ban remains in place.

The advocates of lifting the ban also distinguished between the beneficial impact of lifting the ban on existing ANS output and the prospects for new, smaller fields such as Endicott Field and the second phase of the Milne Point development project. They argue that the additional wellhead profits resulting from lifting the ban are necessary to finance the small marginal onshore fields as well as offshore Alaskan petroleum exploration and development.

On the other hand, opponents of lifting the ban maintained that the additional profits to the producers would not significantly increase the economics of exploration and development on the North Slope. The Coalition to Keep Alaska Oil argued that in spite of depressed prices, the

"net production profits from the Sadlerochit field are \$5 per barrel and annual profits today total nearly \$3 billion a year. We fail to see how a net increase of less than \$1 per barrel to producers drastically improves the economics of exploration and development on the North Slope."

Exxon contended that lifting the export prohibition will not result in appreciably higher production. They believe that Alaskan development is already proceeding at full speed and is not being constrained by the lack of markets. Rather, in their view, the constraint is access by the companies to attractive lease acreage.

3. Federal and State Revenues

The major conclusion of the various parties on the revenue impacts were: (1) the Federal Government and the State of Alaska would obtain increased revenues, (2) the State of Alaska would not incur any offsetting costs such as the Federal maritime losses, and (3) the Federal Government would incur offsetting costs due to maritime losses.

Conoco stated that if the ban were lifted and 500,000 B/D were exported, it would provide \$3 billion in tax revenues for the Federal Government over the next ten years, and \$60 million annually for the State of Alaska over the next ten years.

Opponents of lifting the ban, such as the American Institute of Merchant Shipping, disputed the absolute level of benefits flowing to the U.S. Government. While they agreed that the State of Alaska will incur no losses, they do foresee the Federal Government receiving lower revenues because of losses on Title XI defaults, tax losses on non-federally insured ship bankruptcies, and tax losses resulting from ships and employees forced out of business. In this regard, the American Institute of Merchant Shipping stated that the Federal Government may recognize some increases in tax receipts, but it "will lose some \$800 million to \$1.5 billion of Federally insured Title XI mortgage loan guarantees." They also stated that the government will "lose tax revenues estimated at \$150 to \$200 million from bankrupt vessel operators in the domestic trade and their employees who would be forced out of employment."

4. Consumers

Advocates and opponents of lifting the export ban disagreed regarding the consumer impacts. The advocates put forth an economic efficiency argument to support their point. First, the export of the oil would result in more efficient transportation patterns and the reduced shipping charges would flow to Federal and State Governments as tax revenues and to the producers as additional profits. The latter would invest in exploration and development and expand Alaskan production. Increased production would expand the availability of world energy supplies and moderate any upward pressure on world oil prices.

The above arguments take a long-term approach to consumer benefits. They base it on the more efficient allocation of resources to the economy -- i.e., assets engaged in expensive shipping can be redirected to exploration and development -- and more energy supplies will lead to greater competition and ultimately moderate or even reduce world oil prices. The consumer would then benefit through reductions in the prices of petroleum products.

The opponents of lifting the ban reject this view. Instead, they argued that exports will result in refiners, particularly those on the West Coast, paying higher prices for replacement crude supplies. These higher prices will then translate into higher petroleum product prices. The opponents estimated that consumer prices could be \$1-2 billion per year higher if the ban were to be lifted. Moreover, the West Coast market would receive the brunt of the higher prices.

The Citizen/Labor Energy Coalition and the Coalition To Save Alaskan Oil argued that it is the interest of U.S. consumers to maintain the ban on ANS crude exports. Their arguments cited the elimination of the "West Coast price discount" if ANS crude were to be exported and the need for West Coast companies to obtain new crude suppliers to replace ANS crude and higher prices for consumers.

5. Employment

The advocates and opponents recognized that lifting the export ban would seriously harm employment in the maritime sector. Depending upon whether the party is an advocate or an opponent of lifting the ban, they took different perspectives on the potential unemployment problem in the maritime sector.

Advocates of lifting the ban basically viewed the maritime employment impact as part of an industry adjustment process. They generally view U.S. shipping as expensive and unable to compete in world markets. Lifting the ban would result in: (1) U.S. shipping companies becoming more competitive, and (2) the companies that are unable to compete would go out of business.

The advocates of ANS exports also pointed out that employment prospects would be enhanced in the petroleum sector. For example, AMOCO stated that, "The \$2-billion Endicott Field development project will employ more than 600 people during construction and provide at least 150 long-term jobs after production start-up, as well as numerous additional jobs in various service industries."

Many opponents of exporting ANS crude strongly argued that employment levels within the maritime sector would significantly decline with the export of ANS crude. The AFL-CIO's submission to the Federal Register Notice stated that "based upon an export level of 300,000 barrels per day and the estimated idling of 25 vessels, approximately 1700 maritime workers would lose their jobs."

Approximately 6,000 to 7,000 workers engaged in the supply of intermediate goods and services to the shipping industry would lose their jobs as well."

6. Refining Industry

The refining issue produced strong differences between advocates and opponents of lifting the ANS ban. The advocates addressed the presumed beneficial impacts for the West Coast refining industry. Their argument was that today West Coast refiners have a surplus of ANS and California heavy crudes. These heavy crudes yield a slate of products that is not optimally suited for the California market. Therefore: (1) refiners have a surplus of residual fuel oil that they must export at low prices, and (2) refiners face the prospect of investing large sums in refinery conversion facilities. Exporting ANS crude and importing light sweet crude in its place will result in a better slate of products for the California market. There will also be less surplus high sulfur residual fuel oil to market on the West Coast or export and the price of California heavy crudes will improve. Refiners' profits will increase over time as they market a more desirable slate of clean petroleum products that can command better prices.

On the other hand, the opponents of lifting the ban outlined a series of negative impacts for the refining industry. UNOCAL, TOSCO, Beacon Oil, Edgington Oil and the American Independent Refiners Association PADD V Committee contended that lifting the ban will result in loss of their ANS crude supplies to foreign customers and/or sharply higher prices to U.S. refiners for ANS crude. Erosion of profit margins -- the U.S. refiners will have to buy expensive foreign crude and may not be able to recover all their costs -- will result in some independent refiners going bankrupt. Additionally, the uncertainty in the refining sector given declining oil prices may lead to expanded petroleum product imports. The independent refiners viewed product imports as a threat to their continued existence. In short, the independents are more comfortable maintaining the status quo and using the existing mix of ANS and California crudes in their refineries.

7. Shipping

The comments on shipping produced some of the largest differences between the parties that provided comments. Both the advocates and opponents of the ANS export ban agreed that the U.S. Maritime sector would suffer the most if the ban were lifted:

The advocates believed that the U.S. shipping sector would suffer if the ban were to be lifted because in large part the maritime industry was uncompetitive. Dr. Fred Singer, for example, argued that lifting the ban would force the U.S. shipping industry to be

more competitive. Both Singer and other advocates of exports believe that this would be a good development for a number of reasons. First, the U.S. shipping industry would become more competitive. Second, uncompetitive shippers would go out of business and these assets would be reallocated to more efficient uses. They also believe that the overall national benefits derived from lifting the ban outweigh the debits incurred by the maritime industry. Finally, the advocates view exports as an opportunity for U.S. ships to carry part of the ANS crude.

The opponents of the ban sharply disagreed with the advocates. The opponents, who range from the shipbuilding and repair industry to UNOCAL, Exxon, and the AFL-CIO, believe that when the U.S. Congress passed the Trans-Alaska Pipeline Act (1973), it established an understanding that ANS crude was to be used exclusively in the United States. In reliance upon this, the companies built a large crude oil supply infrastructure comprised of a pipeline and a fleet of tankers. They view lifting the export ban as changing the ground rules in midstream and depriving the U.S. of its PADD V (West Coast) crude oil supply delivery infrastructure. Moreover, the disassembly of this crude oil delivery network would have substantial financial costs to the already hard pressed U.S. flag fleet.

The Transportation Institute pointed out that "the export of 300,000 B/D of ANS crude would reduce demand for tankers by over two million deadweight tons. This would cause nine vessels to be idled in the Pacific Basin and 16 in the Atlantic. The owners of these idled ships would lose approximately \$250 million a year in operating revenue. Additionally, the worldwide surplus of shipping capacity would prevent these ships from being sold at a price which would adequately compensate the owner."

The U.S. flag tanker tonnage dedicated to the ANS trade amounts to approximately 60 percent of U.S. operating tanker tonnage. The maritime critics of lifting the ban viewed this event as the possible prelude to a demise in U.S. ship construction and repair facilities. They believed that once the ban was lifted, U.S. shipyards would stop building new tankers. Moreover, there would be less demand for U.S. non-military ship repair facilities. In this regard, the National Marine Beneficial Association pointed out that "since Alaska and Gulf Coast ship repair facilities provide about 40% of all revenue earned by West and Gulf Coast ship repair facilities, Alaska oil exports would have a major impact on the shipbuilding industry as well."

The other major issue involves shipping ANS crude at various export levels. The maritime critics all rejected Free Market export volumes as totally unacceptable. There was a limited discussion of the small export volumes -- 50,000 - 200,000 B/D. To the extent it was discussed the maritime critics were not in favor of the partial export scenarios.

On the other hand, the State of Alaska and the Yukon Pacific Corporation endorsed partial exports as a reasonable alternative. In its comments, the State of Alaska argued for exports of 200,000 B/D (Note: This amount roughly approximates the State's share of royalty oil - i.e., 12.5 percent of production) and some exports from new fields. The State suggested that the impact on the U.S. shipping industry can be partially mitigated by requiring the use of U.S. flag tankers for part of the crude oil exports. Similarly, the Yukon Pacific Corporation would like to see exports determined by market forces but recognized that partial exports would be preferable to continuation of the ban.

"If any stopgap alternative is to be employed, freeing up new production from marginal fields for export would be best. This compromise would at least protect the current infrastructure set up to deliver Prudhoe Bay oil, while providing the incentives necessary to get new exploration and production on line."

8. Trade

The foreign trade impact of lifting the ANS crude export ban evoked numerous comments. The parties made their points on a more general level and addressed bilateral U.S./Japan trade issues.

Neither the advocates nor the opponents attempted to quantify systematically the export benefits and the corresponding crude oil replacement costs.

The American Association of Exporters and Importers and the State of Alaska cited the beneficial impact of lifting the export ban on U.S./Japan bilateral trade. Exports of ANS crude to Japan would demonstrate the willingness of the U.S. Government to remove trade barriers. Each 100,000 B/D of ANS crude exports would reduce the U.S. trade deficit with Japan by approximately \$900 million (at \$25 per barrel FOB Alaska). U.S. oil exports could lead to Japanese interest in Alaskan natural gas and coal and investment capital to facilitate new trade projects. This viewpoint of the benefits of lifting the ANS export ban also lead its adherents to argue that the Japanese may be willing to make concessions in other areas of the trade relationship.

The opponents cited a number of presumed negative trade impacts. Exxon, as well as some of the independent refiners, see a slightly negative trade impact if ANS crude is exported FOB Alaska and foreign crude is imported on a CIF basis. The United States would wind up with a small trade deficit stemming from paying a small differential to import crude in foreign tankers while exporting ANS crude on foreign ships. None of the commentators, however, attempted to quantify this small deficit.

The next level of opposition to the trade benefits came from those that are upset by the large U.S./Japan trade deficit. They view ANS crude exports as a short-term band-aid that slightly relieves a symptom of the bilateral trade problem but does not deal with the larger problem of access for United States goods to the Japanese market. It makes no sense for the U.S. to export market priced fuels and raw materials that the Japanese then convert into finished goods to compete with the United States in world markets.

9. Foreign Policy

In the realm of foreign policy, the commentators disagreed as to whether lifting the ban on exporting ANS crude would jeopardize or improve our interests. The advocates argued that exporting ANS crude would further the current U.S. international energy policy of providing our allies with dependable sources of crude oil. Specifically, if crude oil was exported to Japan, the U.S.-Japanese relationship might be strengthened by (1) allowing the Japanese to diversify their sources of crude oil, (2) reducing their trade surplus with the United States, and (3) perhaps opening the door to solving some of our other trade problems with Japan. At present, the Japanese are approximately 60 percent to 70 percent import dependent upon Middle Eastern oil producing nations for crude oil.

Furthermore, the advocates argued that ANS exports would be replaced by imports to the Gulf Coast from non-Middle East producing nations such as Mexico and Venezuela. This could further weaken OPEC's influence on the world oil market while helping Mexico and Venezuela to honor their debts with the United States and improving their current internal economic situation. It would also benefit current U.S. energy policy by allowing us to diversify further our sources for imported crude oil.

On the other hand, opponents argued that since the United States is dependent on imported oil for about 30 percent of its domestic needs, there would be no significant gains resulting from the export of ANS crude to our Pacific Rim allies. The United States would simply import oil, particularly from unreliable Middle East sources to replace the ANS crude. This would not result in an improvement in U.S. energy security.

Opponents of lifting the ban argued that the United States would obtain no trade concessions in terms of gaining access for manufactured goods to the Japanese in return for exporting crude oil. They based this observation on the view of prior U.S. experiences in negotiating with the Japanese and the fact that the United States currently has a large trade deficit with Japan. They also stated that it is inconsistent for the United States to export crude while we are filling the Strategic Petroleum Reserve with foreign crude.

10. National Security

The advocates and opponents disagreed as to the effects exporting ANS crude would have on current national security interests. The State of Alaska argued that the United States must maintain a strong energy position vis-a-vis rising energy prices and potential disruptions on the international oil market. Exporting ANS crude would enhance Japanese energy security. The additional profits from the ANS wellhead price increases resulting from lifting the export ban would flow to the producers. The latter would be invested in new production that would expand Free World supplies and moderate future oil price increases.

It is also argued that should oil shortages in the event of a national emergency arise, the President, under the International Emergency Economic Powers Act, does have the authority to restrict oil exports. (Note: other statutory authorities such as the EAA and EPCA also may be available.) Additionally, should North Slope crude restrictions be lifted, strict monitoring controls could be written into the short supply section of the Export Administration Regulations governing these exports.

Opponents, however, made the argument that national security interests would be hurt more than helped by exporting ANS crude oil. Although they argued that the United States would have to import Middle East oil as a replacement for ANS exports, most of their arguments addressed the impact on the domestic tanker fleet. Since Alaskan oil shipments employ approximately 46 percent of the vessels and 74 percent of the tonnage in the domestic tanker fleet, changes in this practice would significantly hurt this industry and result in many smaller tankers going bankrupt and being scrapped. These small tankers are the type of ships that the Defense Department (DOD) would use to deliver clean products (e.g., jet fuel) during a military mobilization. A recent GAO report points out that should a future emergency situation require a military mobilization, this could put the Defense Department in a position of relying on U.S.-owned ships registered under foreign flags to supply petroleum to U.S. forces overseas. This causes concern regarding the reliability of access to these ships since they are often organized under the foreign countries whose flags they fly and may not be easily requisitioned.

11. Postscript

After this section had been completed, comments were received from BP Alaska, an oil producing subsidiary of the British Petroleum Corporation, and from Senator Frank Murkowski of Alaska. Both commentators supported lifting the export ban on ANS crude oil. Their arguments favoring a lifting of the export ban were very similar to the points made by other commentators that support ANS oil exports.

[Docket No. 51194-5194]

Alaskan North Slope Oil Study; Inquiry**AGENCY:** Office of Industrial Resource Administration, International Trade Administration, Commerce.**ACTION:** Request for Comments, Alaskan North Slope Oil Study.

SUMMARY: Section 128 of the Export Administration Amendments Act of 1985 requires that the President undertake a comprehensive review of issues concerning: (1) Possible changes in the existing incentives to produce crude oil from the North Slope of Alaska; and (2) possible changes in the existing distribution of crude oil from the North Slope of Alaska and the appropriateness of continuing existing controls. The Department of Commerce has been designated by the President to coordinate and prepare this review. This notice is to solicit comments from interested parties to assist the Department in preparing the review.

DATE: Comments must be submitted on or before January 23, 1986.

ADDRESSES: Send written comments to Mr. Rodney A. Joseph, Acting Manager, Short Supply Program, Room 3873, Office of Industrial Resource Administration, International Trade Administration, U.S. Department of Commerce, 14th and Constitution Avenue, NW., Washington, DC 20230.

The public comments may be inspected at the Freedom of Information Records Inspection Facility, International Trade Administration, Room 4104, U.S. Department of Commerce, 14th and Constitution Avenue, NW., Washington, DC 20230.

FOR FURTHER INFORMATION CONTACT: Mr. Rodney Joseph, Acting Manager, Short Supply Program, Telephone Number: (202) 377-3984.

SUPPLEMENTARY INFORMATION: On July 12, 1985, the President signed the Export Administration Amendments Act of 1985 (Amendments) which extended and amended the Export Administration Act of 1979 (SEA).

Section 128(a) of the Amendments requires that the President undertake a comprehensive review of issues concerning (1) possible changes in the existing incentives to produce crude oil from the North Slope of Alaska (including changes in Federal and State taxation, pipeline tariffs and Federal leasing policies; and (2) possible changes in the existing distribution of

crude oil from the North Slope of Alaska (including changes in export restrictions which would permit exports at free market levels and at levels of 50,000 barrels per day, 100,000 barrels per day, 200,000 barrels per day, and 300,000 barrels per day) and the appropriateness of continuing existing controls.

The Amendments further state that such review shall include, but not be limited to, a study of:

(A) The effect of such changes on the energy and national security of the United States and its allies;

(B) The role of such changes in United States foreign policymaking, including international energy policymaking;

(C) The impact of such changes on employment levels in the maritime industry, the oil industry, and other industries;

(D) The impact of such changes on the refiners and on consumers;

(E) The impact of such changes on the revenues and the expenditures of the Federal Government and the Government of Alaska;

(F) The effect of such changes on incentives for oil and gas exploration and development in the United States, and

(G) The effect of such changes on the overall trade deficit of the United States and the trade deficit of the United States with respect to particular countries, including the effect of such changes on trade barriers of other countries.

The Amendments further direct the President to develop, after consulting with appropriate State, Federal, and Congressional officials and other persons, findings, options, and recommendations regarding the production and distribution of crude oil from the North Slope of Alaska, and to submit them to the Congress no later than April 12, 1986.

The Department of Commerce is coordinating this study. This notice is published to provide all interested parties with the opportunity to submit comments to the Department of Commerce for consideration in the study process.

Public Comments Invited

The Department of Commerce is soliciting comments from the general public, especially from interested parties in the maritime industry, the oil industry, consumer groups, environmental groups, foreign governments, and all other industries,

groups or individuals likely to be affected by any change in existing law governing incentives and distribution of crude oil from the North Slope of Alaska.

Interested parties are invited to submit written comments, opinions, data, information or advice with respect to the study to the Short Supply Program, Office of Industrial Resource Administration, U.S. Department of Commerce by January 23, 1986.

In the interest of accuracy and completeness, written comments are preferred. Written comments (three (3) copies) should be sent to the address indicated in the address section above. Oral comments should be directed to Rodney A. Joseph, OIRA, (202) 377-3984. If oral comments are received, the Department of Commerce official receiving such comments will prepare a memorandum summarizing the substance of the comments and identifying the individual making the comments, as well as the person on whose behalf they purport to be made. All such memoranda will be placed in the public rulemaking docket and will be available for public review and copying.

Written comments accompanied by a request that part or all of the material contained be treated confidentially will not be considered in developing the study. Such comments and materials will be returned to the submitter.

Communications from agencies of the United States Government or foreign governments will not be made available for public inspection. The public docket concerning this study will be maintained in the International Trade Administration's Freedom of Information Records Inspection Facility, at the address indicated in the address section above. Records in this facility may be inspected and copied in accordance with regulations published in Part 4 of Title 15 of the Code of Federal Regulations. Information pertaining to the inspection and copying of records may be obtained from Ms. Patricia L. Mann, International Trade Administration's Freedom of Information Officer, at the Records Inspection Facility address provided above or by calling (202) 377-3031.

Dated: December 3, 1985.

John A. Richards,
Director, Office of Industrial Resource Administration.

[FR Doc. 85-29008 Filed 12-9-85; 8:45 am]

BILLING CODE 3510-07-0

APPENDIX F

SECTION 126 OF THE EXPORT ADMINISTRATION AMENDMENTS ACT

SEC. 126. ALASKAN OIL STUDY.

(a) REVIEW OF ALASKAN OIL POLICY.—

(1) *IN GENERAL.*—The President shall undertake a comprehensive review of the issues and related data concerning possible changes in the existing incentives to produce crude oil from the North Slope of Alaska (including changes in Federal and State taxation, pipeline tariffs, and Federal leasing policies) and possible changes in the existing distribution of crude oil from the North Slope of Alaska (including changes in export restrictions which would permit exports at free market levels and at levels of 50,000 barrels per day, 100,000 barrels per day, 200,000 barrels per day, and 500,000 barrels per day), as well as the appropriateness of continuing existing controls. Such review shall include, but not be limited to, a study of—

(A) the effect of such changes on the energy and national security of the United States and its allies;

(B) the role of such changes in United States foreign policymaking, including international energy policymaking;

(C) the impact of such changes on employment levels in the maritime industry, the oil industry, and other industries;

(D) the impact of such changes on the refiners and on consumers;

(E) the impact of such changes on the revenues and expenditures of the Federal Government and the government of Alaska;

(F) the effect of such changes on incentives for oil and gas exploration and development in the United States; and

(G) the effect of such changes on the overall trade deficit of the United States, and the trade deficit of the United States with respect to particular countries, including the effect of such changes on trade barriers of other countries.

(2) *FINDINGS, OPTIONS, AND RECOMMENDATIONS.*—The President shall develop, after consulting with appropriate State and Federal officials and other persons, findings, options, and recommendations regarding the production and distribution of crude oil from the North Slope of Alaska.

(b) *CONSULTATION AND REPORT.*—In carrying out subsection (a), the President shall consult with the Committees on Foreign Affairs and Energy and Commerce of the House of Representatives and the appropriate committees of the Senate. Not later than 9 months after the date of the enactment of this Act, the President shall transmit to each of those committees a report which contains the results of the review under subsection (a)(1), and the findings, options, and recommendations developed under subsection (a)(2).

THE PRECEDING PAGES WERE TREATED AS
A UNIT IN THE ORIGINAL FILE.



REVIEW OF SOCIAL AND ECONOMIC CONDITIONS

University of Alaska, Anchorage, Institute of Social and Economic Research February 1985, Vol. XXII, No. 1

Alaska North Slope Oil Production and Revenue Projections

How much oil is produced on the North Slope in the coming years will greatly affect Alaska's economy and state revenues. In this Review, the author analyzes how future oil production and revenues from known North Slope fields could be affected by market prices and certain federal and state policies. He then projects the probable range of North Slope production and revenues to the year 2000, based on the likely range of oil prices and other factors. His major findings are:

- Despite the contribution of these new fields, onshore production will probably decline 60 to 70 percent by the year 2000. This decline will occur because production from the new, smaller fields will not come close to replacing current production from Prudhoe Bay.

- The cumulative total of oil produced in Alaska by the year 2010 could vary by several billion barrels, depending on the future price of oil. If oil prices maintain current levels, cumulative production from known fields on the North Slope will probably reach nearly 12 billion barrels by 2010. On the other hand, if prices fall back to mid-1970s levels, cumulative North Slope production could be reduced to less than 10 billion barrels.

INTRODUCTION

Industry sources estimate total oil in place in the vicinity of the Prudhoe Bay field on Alaska's North Slope to be about 60 billion barrels. As shown on the Figure 1 map, this total includes 23 billion barrels of original oil in place at Prudhoe Bay, 5.5 billion in the Kuparuk River field, and 3 billion in the Lisburne formation underlying the Prudhoe Bay field. In

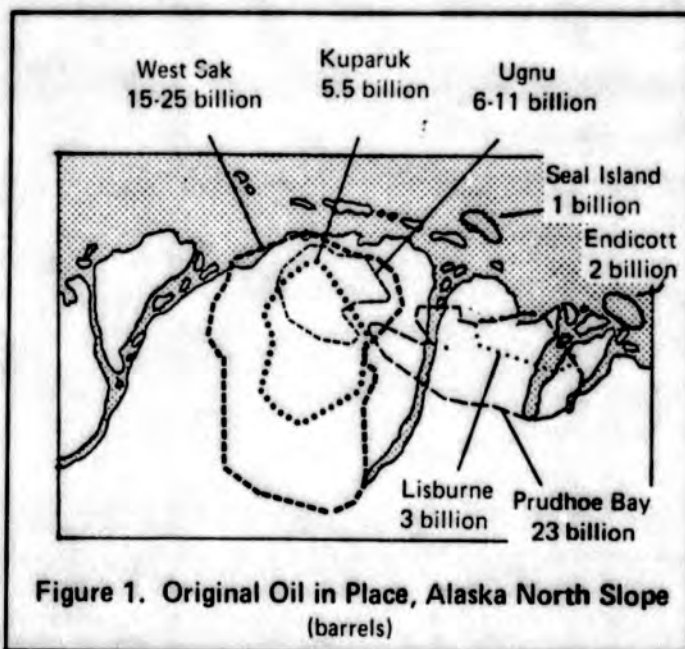


Figure 1. Original Oil in Place, Alaska North Slope (barrels)

addition, estimates of oil in place in the West Sak and Ugnu heavy oil zones overlying the Kuparuk River field range between 21 and 36 billion barrels. Known oil resources on the North Slope outside the immediate vicinity of Prudhoe Bay may bring the total oil in place in the region to 80 billion barrels.¹

However, industry can economically recover only a fraction of this original oil in place. This fraction is often called "recoverable reserves." Under

¹Atlantic Richfield Company, as reported in *Oil and Gas Journal*, June 25, 1984, p. 56, and Arlon Tussing, personal communication, May 20, 1984.

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FEATURE

Matthew Berman

Alaska North Slope Oil Production and Revenue Projections

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economic conditions prevailing during the mid-1970s, only around 9 billion barrels of oil at Prudhoe Bay (and possibly some limited production from the Kuparuk River field) could be considered recoverable reserves. Still, the expected profitability of the gigantic Prudhoe Bay field was sufficient to finance the investment in the Trans-Alaska Pipeline System (TAPS) and the basic infrastructure on the North Slope without considering any potential production outside of the Sadlerochit Reservoir at Prudhoe.

The dramatic surge of world oil prices in 1979-1981 (and the subsequent decline) completely changed the outlook for profitable development of non-Prudhoe production on the North Slope. Although some development of these fields is already underway, future economic conditions may still affect decisions to develop most of this potential production. While we do not know precisely what oil prices will be in the coming years, we do believe that there is a range of likely world market prices. We use three scenarios that bracket the likely price range to provide alternative projections of future production and revenues.

We also consider the potential effects on future North Slope petroleum production and revenues of certain policies which may affect the feasibility of production from marginal fields. We focus on the

effects of federal policy toward the oil and gas industry in Alaska and nationwide, but consider possible state initiatives as well. Policies considered include (1) permitting export of North Slope oil, (2) modifying Alaska severance and income taxes, and (3) extending the federal Windfall Profits Tax and eliminating the exemption for certain Alaska production.

SCOPE

This *Review* focuses on the North Slope region because that is where the largest concentrations of oil occur in Alaska and where most of the state's oil will be produced in the next 15 years. Currently, over 95 percent of Alaska's oil production takes place in the North Slope region, and its predominance is likely to continue for the foreseeable future. Oil production in the Cook Inlet region—the only other producing province—has been declining steadily and is not a significant factor in state revenue projections.²

This analysis concentrates on potential produc-

²Alaska Department of Revenue projections assume an average production decline rate of 12 percent per year. Total oil and gas royalties and severance tax collections would decline to 2 percent of total state royalty and severance taxes by 1990. See Petroleum Production Revenue Forecast, quarterly report, March 1984, Alaska Department of Revenue, Petroleum Revenue Division, p. 16, 18.

tion from known fields on the North Slope up to around the year 2000. It is likely that additional large oil reservoirs will be discovered in the region by the end of the century. The most promising unexplored areas within state jurisdiction are either offshore or within the boundaries of the Arctic National Wildlife Refuge. Exploration is just beginning in the wildlife refuge, and adjacent offshore areas have not yet been leased. While large discoveries may result from exploration in these areas, the lengthy permitting process and the high cost of access will most likely defer production beyond the year 2000.

Market prices and public policy will affect the location and intensity of industry exploration effort, timing of discoveries, and commencement of production. However, major impacts on future production resulting from an altered rate of discovery of new fields would also have little effect on future production until after the turn of the century. Since our focus is on Alaska petroleum production and revenues to the year 2000, we do not attempt to quantify this potential effect.

Instead, we analyze how market prices and government policies may affect the feasibility of investments to develop and operate major North Slope fields that have already been discovered. We project annual Alaska petroleum production and revenues to 2000, as well as implied cumulative production and revenues from the currently known North Slope fields to 2010.

While commercial discoveries and subsequent production are likely to occur on the Alaska Outer Continental Shelf (OCS), we do not have sufficient information to analyze the effects of prices and policies on OCS production until oil is discovered there. Under current federal policy, the state will receive no direct revenues from OCS production.³

We ignore the potential role of natural gas in the production and revenue scenarios analyzed below, assuming that the region's vast quantities of natural gas will continue to be useful only to support oil production-related activities. If a transportation system is ever built to market Alaska North Slope gas, the high cost would virtually assure that the wellhead price, and hence the direct state petroleum revenues, would be inconsequential. Natural gas discoveries from federal leases in the Bering Sea would likewise be uneconomical to produce under reasonable cost

and world market price scenarios.⁴

PRODUCTION AND REVENUES FROM KNOWN NORTH SLOPE FIELDS

The objective of this study was to analyze how Alaska petroleum production and revenues are likely to respond to certain specific assumptions about market prices and federal policy. This required an analysis of the potential economic feasibility of producing oil from known North Slope fields under a number of assumptions about size of reserves and cost of production, as well as price and policy factors.

Thus, our comparative projections involved a two-step approach. First, we determined if development of a known but undeveloped field would be economically viable under the set of assumptions associated with the particular scenario. We assumed development of a field was feasible if the anticipated discounted cash flow exceeded a 10-percent return on investment above inflation (see Assumptions, page 4). We then added production and revenues from fields calculated to have positive development values to derive the total regional projections.

We projected North Slope production and revenues under eight different scenarios. First, we considered three alternative scenarios for market prices of North Slope oil. Next we examined three scenarios relating federal policy to wellhead oil prices. Finally, we analyzed the effects of two hypothetical modifications to the state's petroleum tax structure.

The eight scenarios chosen cover only a small fraction of the potential variations in market and policy factors affecting Alaska North Slope production and revenues over the next several decades. Nevertheless, we believe that they represent the range of reasonable opportunities and expectations.

Sensitivity of Production to Wellhead Prices

Market Price Scenarios: The purpose of these scenarios is to project likely production rates based on economic feasibility of currently undeveloped North Slope oil fields under low-, moderate-, and high-price assumptions that bracket the likely range of outcomes. We do not attempt to estimate the sensitivity of production to small changes in the wellhead price, since sufficient information is not available to make an accurate assessment. The market price cases assume no change in current federal and state tax structures. (Continued on page 5.)

³A recent ISER report discusses the issues of OCS revenue sharing and the potential future magnitude of Alaska OCS production and revenues. See Matthew Berman and Karen White, "Sharing Revenues from the Outer Continental Shelf and Other Federal Lands," ISER, December 1984.

⁴See *Marketability of Bering Sea Natural Gas*, Dames and Moore, U.S. Department of the Interior, Minerals Management Service, Alaska Outer Continental Shelf Region, Social and Economic Studies Program, Technical Report Number 98 April 1983.

NORTH SLOPE PETROLEUM DEVELOPMENT ASSUMPTIONS

North Slope Fields Considered

We derived production scenarios for the North Slope region from actual and hypothetical development patterns for nine fields or development zones. These included the currently producing Prudhoe and Kuparuk fields as well as seven fields in various stages of feasibility study by industry. We explicitly considered multiple options for development of four of the nine fields, assuming optimistically that any technological problems encountered would be overcome.

Our assumptions for development patterns of new fields were broadly consistent with assumptions used by the Alaska Department of Revenue for forecasting state petroleum revenues. Unlike the department in its forecasts, we explicitly considered changes in the level of oil production which might be economically feasible under different market prices and public policies. Our production and revenue projections also differ in some minor details and refer to the calendar year, rather than the fiscal year. A brief description of potential development patterns considered for each of the fields is as follows:^a

Prudhoe Bay: We assumed an average production rate of 1.534 million barrels per day (BPD) from Prudhoe through 1987. In the basic projection, production would decline to 1.054 million BPD in 1990, and to just over 300 thousand BPD in 2000. If the miscible-gas, enhanced-oil recovery project proves feasible, production would decline somewhat more slowly with a cumulative increase in recovery of almost 115 million barrels.

Kuparuk: We considered development of the field in two discrete stages. Stage 1 describes the currently producing area while Stage 2 refers to the target of ongoing construction of development facilities for the Kuparuk River producing zone. If both stages of the Kuparuk field prove feasible, potential recoverable reserves would just exceed one billion barrels of oil. We assume peak production from each stage conservatively at around 110 thousand BPD, with production available from the second stage in 1985.

Lisburne: ARCO has been testing development wells in the Lisburne pool underlying the Prudhoe Bay field since 1982. We assumed recoverable reserves of around 450 million barrels if commercial development of this prospect is feasible, with production possible by 1987 and reaching

100 thousand BPD.

Milne Point: We examined two stages for development of the smaller Milne Point prospect. The first would target primarily the Kuparuk pay, which might begin producing in 1986, while the second stage would produce from the shallower West Sak pay, beginning in 1990. Peak production from each development stage would be around 30 thousand BPD, with recoverable reserves of about 100 million barrels from the combined project.

Endicott: If successfully developed, the Endicott River area might provide production of 85 thousand BPD, with a startup date in 1987. Although much larger amounts of oil are present in the vicinity, we assumed recoverable reserves of about 300 million barrels.

Gwydyr Bay: Production from this smaller North Slope field could start at 10 thousand BPD with reserves of around 30 million barrels. Production could start as early as 1987 if a decision is made soon to develop the field.

Flaxman: As much as 600 million barrels of oil may be recoverable in the Point Thompson-Flaxman Island area east of Prudhoe Bay. More than one-half of this amount, however, is more appropriately described as gas condensate in the giant Point Thompson gas field. We assumed that the gas field is not feasible to develop in any of the scenarios. However, we did consider development of less than 300 million barrels in a Flaxman field. Oil production, if feasible, might begin by 1990, with a peak flow rate of 80 thousand BPD.

Seal Island: Shell has recently confirmed a discovery in state and disputed state-federal waters in the Beaufort Sea, with two wells yielding 5,000 BPD of 40-degree gravity oil. If development is feasible, the new field could begin production by 1992, with cumulative recovery eventually exceeding 300 million barrels. We assumed a peak production rate of 85 thousand BPD and also assumed that the jurisdictional dispute would be resolved in favor of the State of Alaska.^b

West Sak: We considered two alternative phases for potential large-scale commercial development of shallow Cretaceous heavy oil deposits near the Kuparuk producing area. Phase I covered the area immediately overlying the Kuparuk, with which some development facilities and costs could be shared. This phase might begin in 1989, recovering as much as 750 million barrels if production is economically viable, with peak production reaching 150 thousand BPD. The second phase essentially covered additional development of a resource four times as large, possibly beginning in 1992, with higher costs due to the need to construct additional development facilities.

^aSee Alaska Department of Revenue, *Petroleum Production Revenue Forecast, Quarterly Report*, September 1984, pp. 13-16. A listing and documentation for the model used for the analysis presented in this Review, along with the exact production parameters and cost assumptions used for each selected North Slope field may be found in Matthew Berman, et al., *Alaska Petroleum Revenues: the Influence of Federal Policy*, ISER, October 1984, Appendix F.

^bSee *Oil and Gas Journal*, July 2, 1984, p. 27.

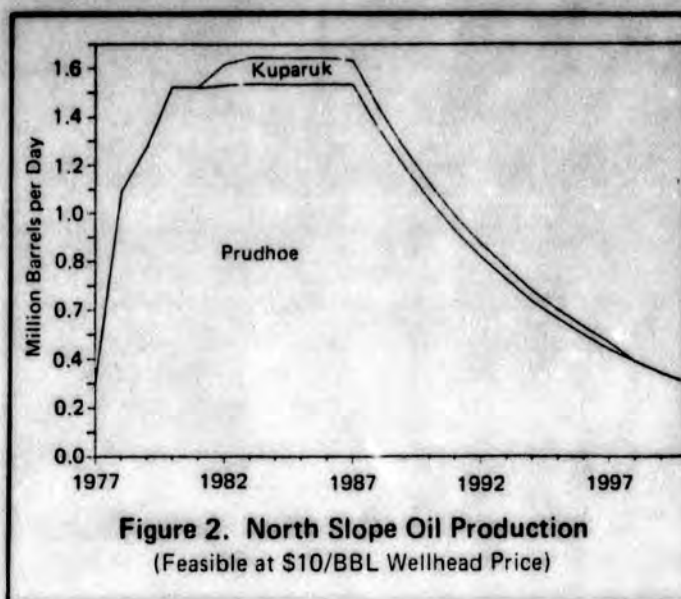
Low Price (Scenario 1): The low-price scenario assumes a constant real market price schedule of \$10 per barrel for Prudhoe Bay oil, or \$7.50 per barrel less than that currently prevailing on the North Slope. This price corresponds roughly to a world price of \$20 per barrel, which might result from the collapse of OPEC. The wellhead price of \$10 per barrel in 1984 dollars is roughly comparable, after adjusting for inflation, to the average price level prevailing during the initial 2 to 3 years of operation of the Trans-Alaska Pipeline. Thus, the low-price scenario projects feasible North Slope oil production at the real wellhead price level prevailing in the mid-1970s.

At the wellhead price levels prevailing in the 1970s, only Prudhoe Bay production (without the miscible-gas enhanced oil recovery project) can cover fixed development costs. Although development of the Kuparuk field is not profitable in the low case under the current industry tax structure, our estimates show that some Kuparuk development would be feasible under the lower state tax rates prevailing during the mid-1970s, even with the low market prices.

If oil prices fell back to the mid-1970s level, all major new North Slope investments would lose money, including the ongoing expansion of Kuparuk production. We assumed that current production rates at Kuparuk would continue in any case, since the major fixed costs have already been incurred there. Although producers might complete the current Kuparuk expansion as well, even with the low price projection, they would probably abandon all other North Slope development projects. Thus, the low-price case also represents a lower bound for likely North Slope oil production even if world oil prices collapse.

Figure 2 shows projected Alaska North Slope production under the low-price assumption. Total projected oil production in the low-price case begins falling in 1987 from its approximate current rate of 1.6 million barrels per day (BPD). Production declines to 1.1 million barrels in 1990 and to 300 thousand BPD in 2000.

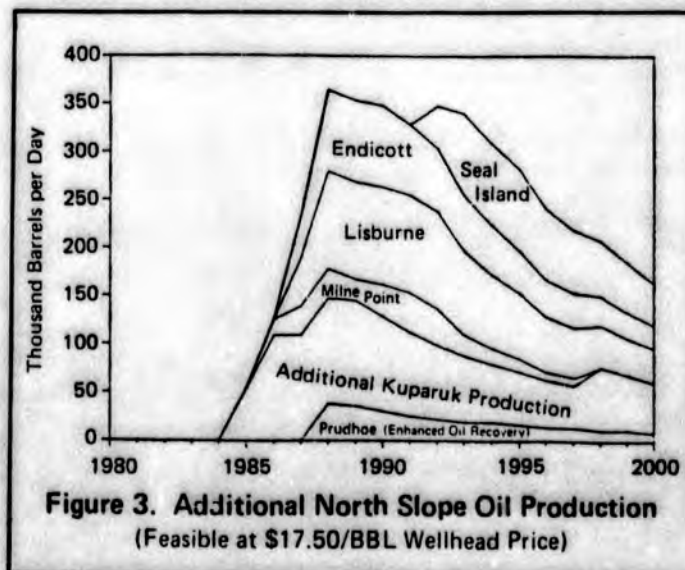
Moderate Price (Scenario 2): For the moderate-price scenario, we assumed that wellhead oil prices would remain constant (after adjusting for inflation) at about the current levels throughout the projection period. The moderate price projected for Prudhoe Bay was \$17.50 in 1984 dollars and \$16.00 for Kuparuk. This is a conservative price projection, due in part to the likely decline over time in the TAPS. tariff, at least in today's dollars. Thus, we might think of the moderate price projection as a risk-adjusted, middle-range scenario. It is roughly



consistent with the Alaska Department of Revenue's long-run wellhead price projections.⁵

The moderate-case scenario represents additional projected oil production made possible by the net rise in real wellhead oil prices to the mid-1984 level, assuming that the net price rise is permanent. Figure 3 projects incremental North Slope oil production under the moderate (1984 real price) assumptions above what was feasible under the low (1970s) price level. The figure shows production from four new fields—Milne Point, Endicott, Lisburne, and Seal Island—as well as additional production from Prudhoe Bay and Kuparuk. Production for three of the fields—Gwydyr Bay, Flaxman, and West Sak—still appears infeasible under the moderate-price assumptions.

⁵C.f. Alaska Department of Revenue, *Petroleum Production Revenue Forecast, Quarterly Report*, September 1984, p. 11.

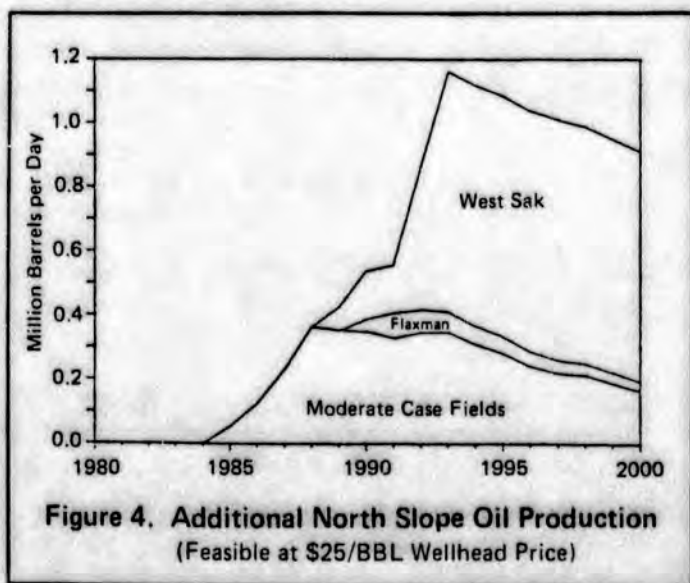


The figure shows incremental production, resulting from the net rise in world oil prices from the mid-1970s to 1984, peaking at over 360 thousand BPD in 1988. Incremental production would then decline to around 280 thousand BPD in 1995 and to around 160 thousand BPD in 2000. Although production would be declining by 2000 in all fields, two of the fields, Prudhoe Bay and Seal Island, would still be producing in 2010, according to the projections.

High Price (Scenario 3): The high-price scenario assumes a constant real price of \$7.50 per barrel greater than the current price, or \$25 for Prudhoe Bay oil. This is roughly the same real price as prevailed in 1981 at the historical peak of world oil prices. This scenario projects oil production that would be feasible if real wellhead oil prices were to return permanently to 1981 levels.

Figure 4 projects incremental production above the low-price case for the high-price scenario. In the high case, all the fields would be feasible except for Gwydyr Bay, which would be nearly feasible. While it is possible that this smaller field could be developed in conjunction with adjacent, more profitable fields, costs are apparently too high for it to stand on its own under even an optimistic price projection.

Incremental North Slope production feasible at the 1981 real wellhead oil price level (beyond that which was feasible at the 1970s price level) would rise to over 1.1 million BPD in 1993-1995. This figure includes about 300 thousand BPD from the "marginal fields" (fields which would be feasible in the moderate case but not in the low case), as well as 800 thousand BPD from the Flaxman and West Sak developments. Incremental production in the high-price scenario would decline slowly, still exceeding 900 thousand BPD by 2000.



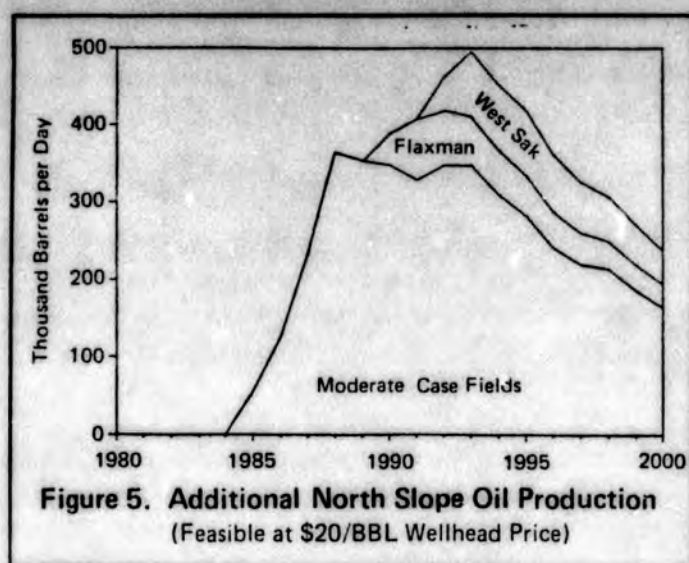
Federal Wellhead Price Policy (Scenario 4): A policy of major discriminatory federal action against Alaska petroleum producers and the state prevents export of oil carried through the Trans-Alaska Pipeline. The economic effect on Alaska petroleum production of lifting the current restriction is unclear at this point since it is not certain how producers and the state would choose to react to the foreign market opportunities, if they were available. It is most likely that a large portion of North Slope oil would continue to supply domestic markets. We assume for the sake of the scenario that the opportunity to export North Slope oil would lead to an increase in the average wellhead price of \$2.50 in 1984 dollars.⁶

A separate area of federal policy that has a large potential effect on North Slope wellhead oil prices is the set of rules chosen by the Federal Energy Regulatory Commission (FERC) as the basis for determining the TAPS tariff. The state and the pipeline owners have been disputing the tariff rules continuously since the pipeline began operation in 1977. A final ruling by the agency along the lines of the proposed settlement submitted by ARCO in December 1984, might also raise the average wellhead price on the North Slope by \$2.50 per barrel by the 1990s, similar to the export case assumption.

Figure 5 summarizes North Slope production for the hypothetical "export" case. Higher wellhead oil prices in this scenario, which might also arise from a favorable TAPS tariff ruling, would permit development of the first stage of West Sak heavy oil and the Flaxman field. These fields would provide 140 thousand BPD of additional production in 1995 and a little more than half that in 2000. Total projected production above that projected for the low (mid-1970s real wellhead) price scenario would peak at around 500 thousand BPD in 1993 and decline to 238 thousand BPD in 2000.

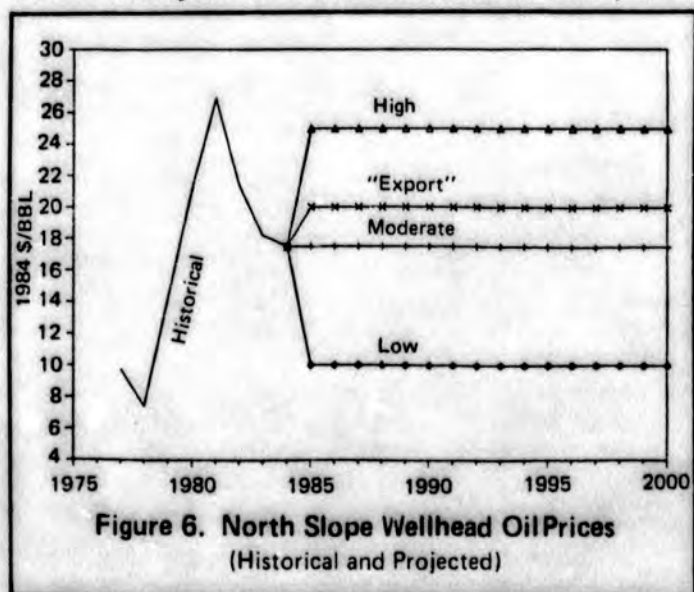
Direct wellhead price control is another area of federal petroleum industry policy that has in the past greatly concerned oil producers and producing states. Oil price controls are unlikely to reappear under current or weaker market conditions. Gas price controls are largely irrelevant to the North Slope region. Re-emergence of price controls would be possible under a scenario of renewed supply disruption.

⁶A detailed analysis of a number of scenarios for the potential effects of lifting the export ban on the price received for North Slope oil is contained in "The Export of Oil to Japan—State Revenue Impacts," in Alaska Department of Revenue, Division of Petroleum Revenue, *Petroleum Production and Revenue Forecast*, quarterly report, March 1983, pp. 17-24.



More likely, however, Congress would add a new producer excise tax (or simply extend the life of the Windfall Profits Tax), as much for its revenue-raising potential as for its redistributive role. We consider the impact of such a hypothetical move below.

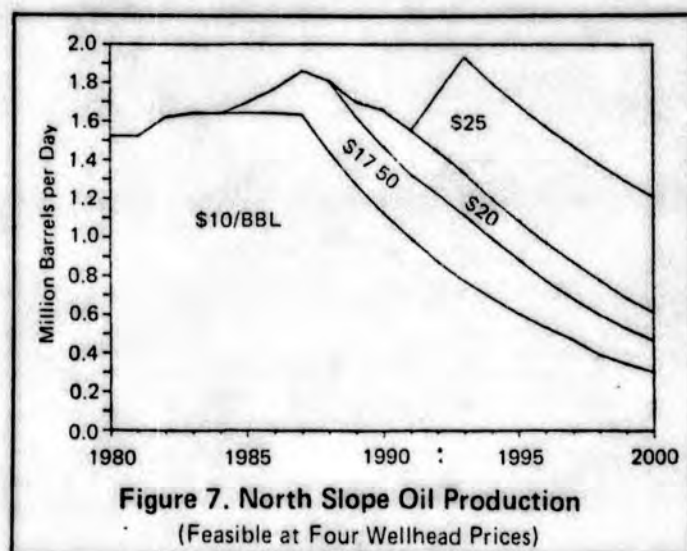
Analysis of price scenario results: Figure 6 summarizes the North Slope wellhead price assumptions for the four price scenarios, showing the relationship of projected to historical real price levels. Figure 7 summarizes total projected North Slope oil production rates for the four scenarios associated with the alternative projected wellhead price levels shown in Figure 6. Total oil production rates in the low-price case would begin falling from over 1.6 million BPD in 1987, dropping to 1.1 million BPD in 1990, and to 300 thousand BPD in 2000. The figure shows that annual production in the moderate price case would peak at 1.9 million BPD in 1987, then



decline to around 1.1 million BPD in 1993, and further decline to approximately 500 thousand BPD in 2000.

Higher wellhead oil prices in the export scenario would permit development of the first stage of West Sak heavy oil and the Flaxman field. Total North Slope oil production shown in Figure 7 for the export case would remain above 600 thousand BPD until 2000. Total North Slope production in the high price case, which includes large-scale development of West Sak sands, would actually peak at over 1.9 million BPD in 1993, and still exceed 1.2 million BPD in 2000.

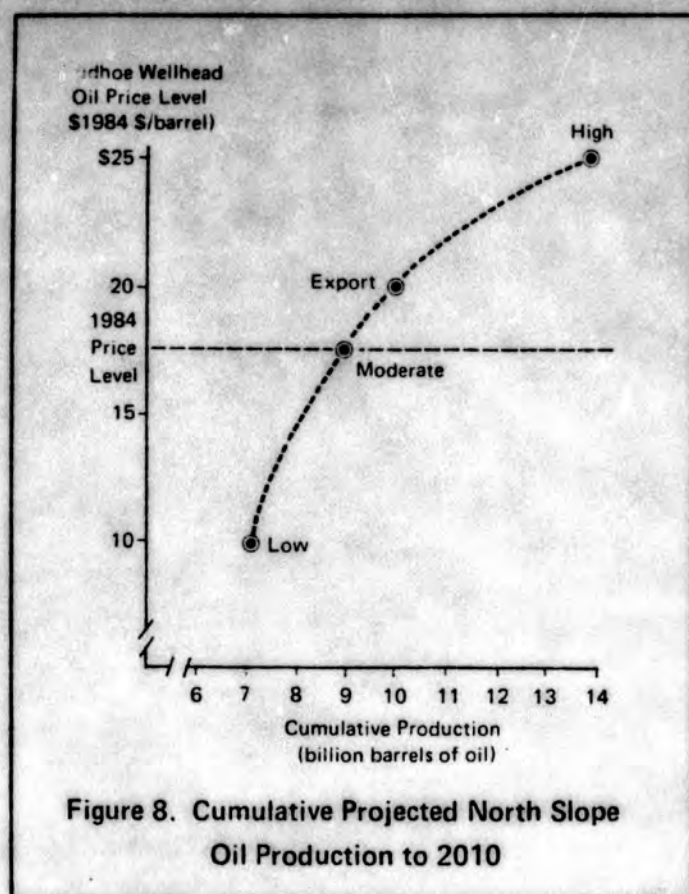
Table 1 shows the tabulation of cumulative projected production by field for the four wellhead-price scenarios discussed above. The table also includes for comparison a set of projections for North



Slope oil production made in 1981 by economist Arlon Tussing.⁷ Cumulative production to 2000 for all four of our scenarios is within the 95-percent confidence range of the former projections, with the Tussing "most-likely" scenario falling between the moderate and export-price scenarios of the current study. Our high-price and low-price projections, however, appear to narrow considerably the range of uncertainty of the earlier estimates regarding cumulative North Slope oil production that will be feasible in this century.

Figure 8 graphs the sensitivity of cumulative production from known North Slope fields to the wellhead price. This was done by interpolating results of the four scenario projections shown in Table 1. If

⁷Arlon R. Tussing, "The Outlook for Alaska North Slope Crude Oil Production: 1981-2000," *ISER Research Summary*, No. 8, January 1981, Table 2.



oil prices maintain current levels, cumulative production from known fields on the North Slope will probably reach nearly 12 billion barrels by 2010.⁸ If the price rose to \$20 per barrel (in 1984 dollars), cumulative production by 2010 might exceed 16 billion barrels. On the other hand, if producers expected wellhead prices to fall to \$10 per barrel (again in 1984 dollars), cumulative production might not reach 10 billion barrels.

Price Sensitivity of Revenues

In this section we analyze the sensitivity of expected future revenues to wellhead prices. The revenue patterns include the effects of changes in the quantity of oil which is feasible to produce as a result of price changes, as well as the effects of changes in unit wellhead revenues.

Figure 9 illustrates the projected pattern of Alaska state petroleum revenues received from North Slope oil production under the four different scen-

⁸Assuming original oil in place of 60 billion barrels, this implies a cumulative recovery rate of 20 percent. This rate is somewhat lower than industry averages, due to the large fraction of heavy oil (which is more difficult economically to extract) and the high-cost environment on Alaska's North Slope.

Table 1

Projected Cumulative North Slope Oil Production^a (billion barrels)

Field or scenario	To 2000	To 2010
Low Case	9.25	9.85
Prudhoe Bay	8.83	9.42
Kuparuk	0.43	0.43
Moderate Case	10.75	11.55
Prudhoe Bay	8.92	9.53
Kuparuk	0.87	0.93
Milne Point	0.10	0.10
Lisburne	0.37	0.38
Endicott	0.27	0.31
Seal Island	0.22	0.30
Export Case	11.55	12.63
Prudhoe Bay	8.92	9.53
Kuparuk	0.87	0.94
Milne Point	0.10	0.10
Lisburne	0.37	0.38
Endicott	0.27	0.31
Seal Island	0.22	0.30
Flaxman	0.20	0.26
West Sak	0.60	0.81
High Case	13.42	16.42
Prudhoe Bay	8.92	9.53
Kuparuk	0.87	0.96
Milne Point	0.11	0.11
Lisburne	0.37	0.41
Endicott	0.27	0.32
Seal Island	0.22	0.30
Flaxman	0.20	0.26
West Sak	2.47	4.55
Tussing (1981)^b		
95 percent	8.51	
Most Likely	11.24	
5 percent	22.62	

Note: Individual field projections may not add to scenario totals due to rounding.

^aIncludes production through 1983 of 3.23 billion barrels from Prudhoe Bay and 0.07 billion barrels from Kuparuk.

^bArlon R. Tussing, "The Outlook for Alaska North Slope Crude Oil Production: 1981-2000," *ISER Research Summary*, No. 8, January 1981, Table 2.

arios for the wellhead price of oil. Total state petroleum revenues in Figure 9 include oil royalties, oil severance and conservation taxes, petroleum property taxes on production property, and Alaska corporate

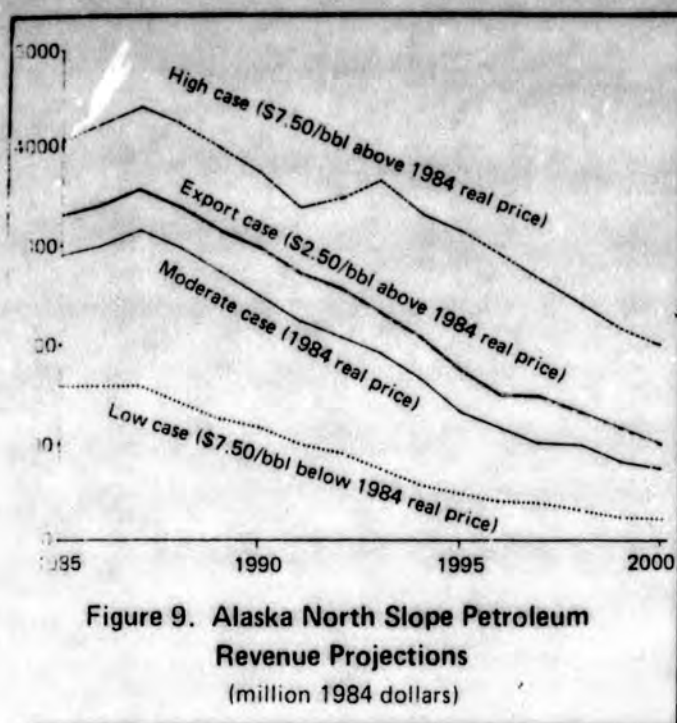


Figure 9. Alaska North Slope Petroleum Revenue Projections
(million 1984 dollars)

ome taxes (apportioned share), but do not include the minor amount of revenues derived from gas production.

Projected state revenues in the moderate price case would average around \$3 billion in 1984 dollars until 1989, then decline to \$2 billion in 1992 and to \$730 million (all in 1984 dollars) in 2000. Real state petroleum revenues in the low-price case would decline from a level of \$1.6 billion per year to \$1 billion in 1991, and to only \$240 million in 2000. State revenues in the export case are 21 percent higher than in the moderate case in 1990 and 34 percent higher in 2000. Real state petroleum revenues in the high price case peak at \$4.4 billion in 1987 (measured in 1984 dollars), but are still over \$3 billion in 1995 and nearly \$2 billion in 2000.

We projected that federal petroleum revenues (Windfall Profits Tax and corporate income tax) derived from developing these same North Slope fields would show a pattern which is remarkably similar to that projected for the state revenues. Although projected federal corporate income taxes would be lower initially due to deductions for major field development expenditures, the federal government would receive approximately the same total revenue from these fields as would the State of Alaska.

Figure 10 summarizes projected cumulative state and federal petroleum revenues under the different price scenarios over the period 1983-2010, in 1984 dollars, derived from development of known North Slope oil deposits. The figure shows clearly the high

degree of uncertainty for Alaska petroleum revenues associated with uncertainty about the level of wellhead prices. Cumulative projected state petroleum revenues for 1983-2010 from the North Slope would amount to \$40 billion (in 1984 dollars) if current wellhead prices continue, but may ultimately total between \$20 and \$70 billion dollars, depending on future wellhead oil price levels. Cumulative federal revenues are slightly more responsive to wellhead oil prices than are state revenues, due to the federal government's greater reliance on income taxes as opposed to excise taxes and royalties for collecting petroleum revenues.

Effects of Revenue Policy on Production and State Revenues

A number of proposals that attempt to set a federal severance tax policy on energy resources have surfaced recently in Congress. These include a proposed national severance tax on oil of around \$3 per barrel and proposals to limit state severance taxes.⁹ A national severance tax of, say, \$3 per barrel, if it were applied to state royalty shares as well as to private production, would affect Alaska production and state revenues in the same way as would a \$3 reduction in the market price. One can infer from Figures 8 and 10 that the effect of such a new federal tax might be a reduction of around a billion barrels in recoverable North Slope reserves, and an accompanying loss

⁹The federal statute applies a tax rate schedule to the excess of the wellhead price over a "base price" representing a 1979 wellhead price level. See PL 96-223, 94 Stat. 229 (1980); 26 USC §§ 4986-4998.

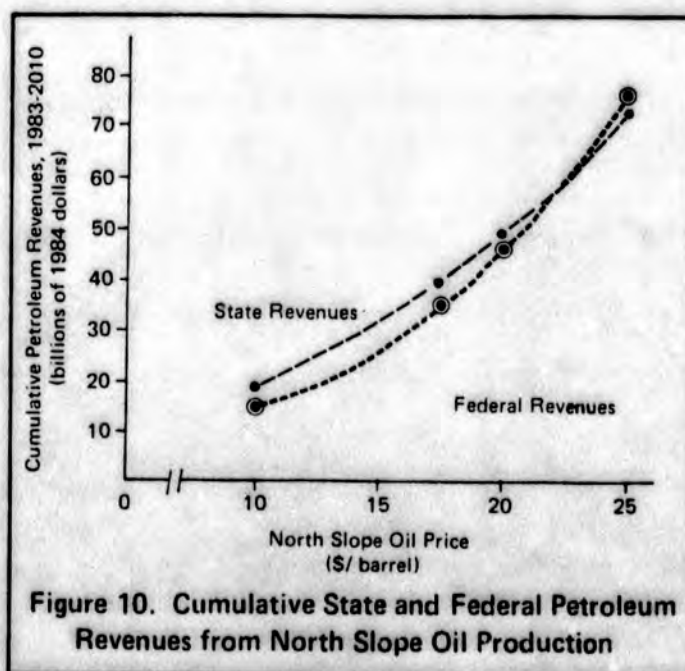


Figure 10. Cumulative State and Federal Petroleum Revenues from North Slope Oil Production

by 2010 of around \$10 billion (in 1984 dollars) in state revenues.

Federal Windfall Profits Tax Extension (Scenarios 5 and 6): Congress passed the federal Windfall Profits Tax in 1980 as part of the program removing controls from domestic oil prices. It is an excise tax on oil production with a rate structure based on the difference between current oil prices and 1979 levels—the so-called “windfall profit” from decontrol—and with a provision that causes the tax to expire automatically after about 10 years. Attempts to prolong the life of the Windfall Profits Tax, or even increase its effective rates, are more likely to succeed in Congress than attempts to impose a new federal tax. North Slope prices in the low and moderate cases would be low enough so that the Windfall Profits Tax would have a very limited impact. We considered two scenarios, however, in which Congress would not only extend the Windfall Profits Tax indefinitely, but also would eliminate the current special tax exemption for non-Prudhoe North Slope oil. One scenario combines the extended Windfall Profits Tax with the high-price scenario, the other with the export scenario.

Our accounting projections showed that extending the Windfall Profits Tax and removing the Alaska exemptions would not change the economic feasibility of any proposed North Slope development project. Indeed, even in the high-price scenario, only Prudhoe Bay would feel the impact of the tax. This is because the statute classifies production from all other North Slope fields as “newly discovered oil.” By statute, the “base price” for this type of oil increases 2 percent per year above inflation.¹⁰ Even with a \$7.50 increase in world oil prices, the North Slope price typically would not exceed the statutory base price.

However, an extended Windfall Profits Tax would have a significant impact on *federal revenues* from the Prudhoe Bay field. The tax would raise nearly \$500 million (measured in 1984 dollars) in additional federal revenues from Prudhoe Bay in 1995 in the high case, and nearly \$300 million more in 2000. State revenues would decline by \$20- to \$30-million annually in the 1990s, due to the effect of higher Windfall Profits Tax deductions from state taxable income. In the export case, federal revenues would increase by around \$170 million in 1995 and

by nearly \$100 million in 2000 if Congress were to retain the Windfall Profits Tax through the end of the century.

State Tax Policy (Scenarios 7 and 8): Scenarios associated with modifications of the Alaska petroleum tax structure would involve potential changes in economic feasibility of marginal fields which are more subtle and complex. We consider projections associated with two such scenarios. We assume the moderate wellhead price projection would prevail in both scenarios because it is more representative of likely future market conditions.

Both scenarios allow us to examine the effects of hypothetical reductions of the Alaska severance tax rate to 10 percent from the current 12.25- to 15-percent schedule. In one scenario, the legislature would eliminate the economic limit factor (ELF)—a formula which reduces the effective tax rate as average production rates per well decline—so that the effective rate would remain at 10 percent.¹¹

In the other scenario, the state would win court approval and reinstate the separate accounting method of assessing petroleum corporate income taxes. The separate accounting method assesses the Alaska corporate income tax rate of 9.4 percent on income earned within the state from oil and gas production and transportation activities. The tax was repealed in 1981 under pressure of litigation. This scenario assumes that the severance tax structure would stay intact, except for a reduction in the nominal rate to 10 percent.

The projections for the two state tax scenarios—both based on the assumption of moderate price levels—are remarkably different. In the scenario that eliminates the ELF, we projected that cumulative state revenues to 2010 would be 18 percent lower than with the current tax structure, even though the wellhead price assumptions are the same. Revenues would be lower partly because production in this case would be only 92 percent of moderate case production in 1990, and 95 percent of moderate case production in 2000. The Endicott field and the Milne Point field do not appear to be feasible to develop

¹¹See *Alaska Statutes*, 43.55. The exact formula for the economic limit factor for oil production equals:

$$(1 - [PEL/TP]) \exp (460 \times WD/PEL)$$

where: PEL = monthly production rate at the economic limit;
TP = total production during the month for which the tax is to be paid;

WD = total number of well days for which the tax is to be paid; and

“exp” indicates that the expression following is an exponent.

The economic limit factor (ELF) for gas production equals:

$$1 - PEL/TP.$$

¹⁰James Love, in “Evaluation of Proposed Federal Energy Taxes,” Alaska Department of Revenue, July 7, 1982, discussed several alternative proposed national energy taxes and their hypothetical impacts on the State of Alaska. Love also illustrated the minimal impact of the federal Windfall Profits Tax on North Slope oil under prevailing market prices, even if the exemption were removed for non-Prudhoe oil.

without the ELF. Apparently, the ELF provision reduces the effective severance tax rates projected for the marginal North Slope fields significantly below 10 percent, despite the apparent high nominal rates of the current tax structure. Thus, eliminating the ELF provides an example of an attempt to increase revenues which results in lower revenues.

The scenario in which the state modifies the corporate income tax to recapture revenue lost from reducing the severance tax rate to 10 percent provides no change in projected production from the moderate case. Total state revenues in this case would be only 1 percent lower than the moderate case projection in 1990 and would actually be 6 percent higher in 2000. Clearly, reinstating the separate accounting method for assessing petroleum corporate income taxes (if a court decision favors its constitutionality) would be a better option for protecting state revenue while encouraging production from marginal fields than turning the severance tax into a true flat-rate tax.

State Policy Toward the Marginal Fields

We have analyzed two possible modifications of Alaska's petroleum tax structure which included reducing nominal oil severance tax rates to 10 percent. One alternative would eliminate the economic limit factor (ELF) (which reduces effective severance tax rates for less-productive fields) to make the Alaska severance tax a true flat-rate tax. The other alternative would retain the ELF but reinstate the separate accounting method for the petroleum corporate income tax, assuming its constitutionality is upheld.

The alternative which eliminates the ELF performs poorly, mainly because it results in higher effective severance tax rates for non-Prudhoe production. Since projected production rates per well for many of these fields are relatively low, (resulting in a low projected ELF), it appears that even relatively low effective severance tax rates may deter development of some marginal fields on the North Slope. We have noted that known deposits of heavy oil on the North Slope near the Kuparuk field possibly contain over 40 billion barrels of oil in place. None of this oil is being produced commercially at the present time,

and any such development would clearly be only marginally profitable under reasonable price projections.

For the first stage of the hypothetical West Sak heavy oil development summarized above, our calculations showed a lack of economic feasibility, because developing the field would cost more than the value of the oil produced under the moderate price assumption. However, the present value of all excise taxes and royalties that would have to be paid by the producers to the State of Alaska is more than four times larger than the negative profit balance. Severance tax projections for this hypothetical development are very small (due to the ELF projected from low production per well of the heavy oil), despite its giant size. Under the development cost and price assumptions used for this field, the state's royalty share makes the difference between feasibility and infeasibility.

The same problem may also be present with other smaller fields on the North Slope. Of course, it would be financially irresponsible for the state to offer to reduce its royalty share on the speculation that this might make production feasible from marginal fields. However, the state might consider ways to credit the capital costs of developing new North Slope heavy oil fields against the first royalty payments owed when production begins. The royalty credit could be converted into a modified net profit share by having the credit repaid with shares of lease income at a rate of, say, 30 percent. Such a program could provide the state with a large increase in revenue, if it stimulates production from new fields which otherwise would not occur.

All our scenarios projected that North Slope oil production would decline steadily in the 1990s, despite the addition of a number of large new fields. This follows from the inevitable decline in the enormous rate of current production from Prudhoe Bay. However, production from new fields commencing over the next 8 years will also be declining by the late 1990s. State and federal policies that affect the feasibility of Alaska North Slope petroleum development will play a major role in determining the rate and magnitude of this expected decline.