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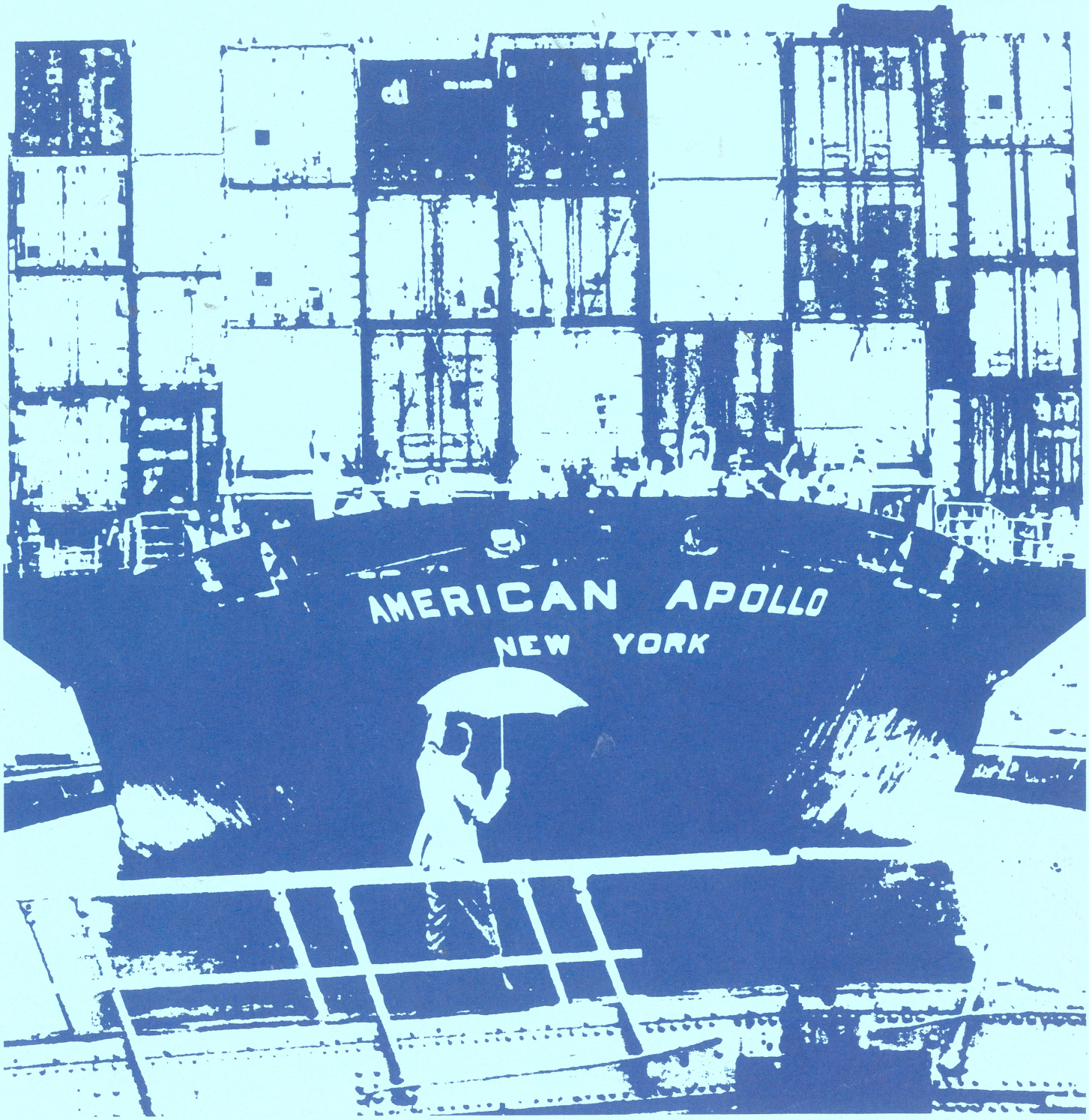
U.S. DEPARTMENT OF COMMERCE
Maritime Administration



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The Annual Report of the Maritime Administration for Fiscal Year 1978

MAY 1979

U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, Secretary

MARITIME ADMINISTRATION
Robert J. Blackwell,
Assistant Secretary
for Maritime Affairs

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THE SECRETARY OF COMMERCE
Washington, D.C. 20230

Sirs:

It is my honor to submit the annual report of the Maritime Administration for fiscal year 1978.

The report describes in detail the Agency's activities to promote and strengthen the American merchant marine. Among the highlights during the year were the following:

* The cargo-carrying capacity of the privately owned deepdraft U.S. merchant fleet reached a record 21.6 million deadweight tons.

* New merchant vessels under construction or on order at private American shipyards on September 30, 1978, totaled 48 (with a contract value of $3 billion), down from the previous year but still second only to Japan among the world's shipbuilding nations.

* Twenty new vessels were delivered by private U.S. yards in this reporting period--near the 5-year average. But new orders declined, portending employment difficulties for some builders in the near future.

* Federal assistance totaling $472.5 million was provided to American ship operators and builders to help them achieve operational/construction cost parity with their foreign counterparts.

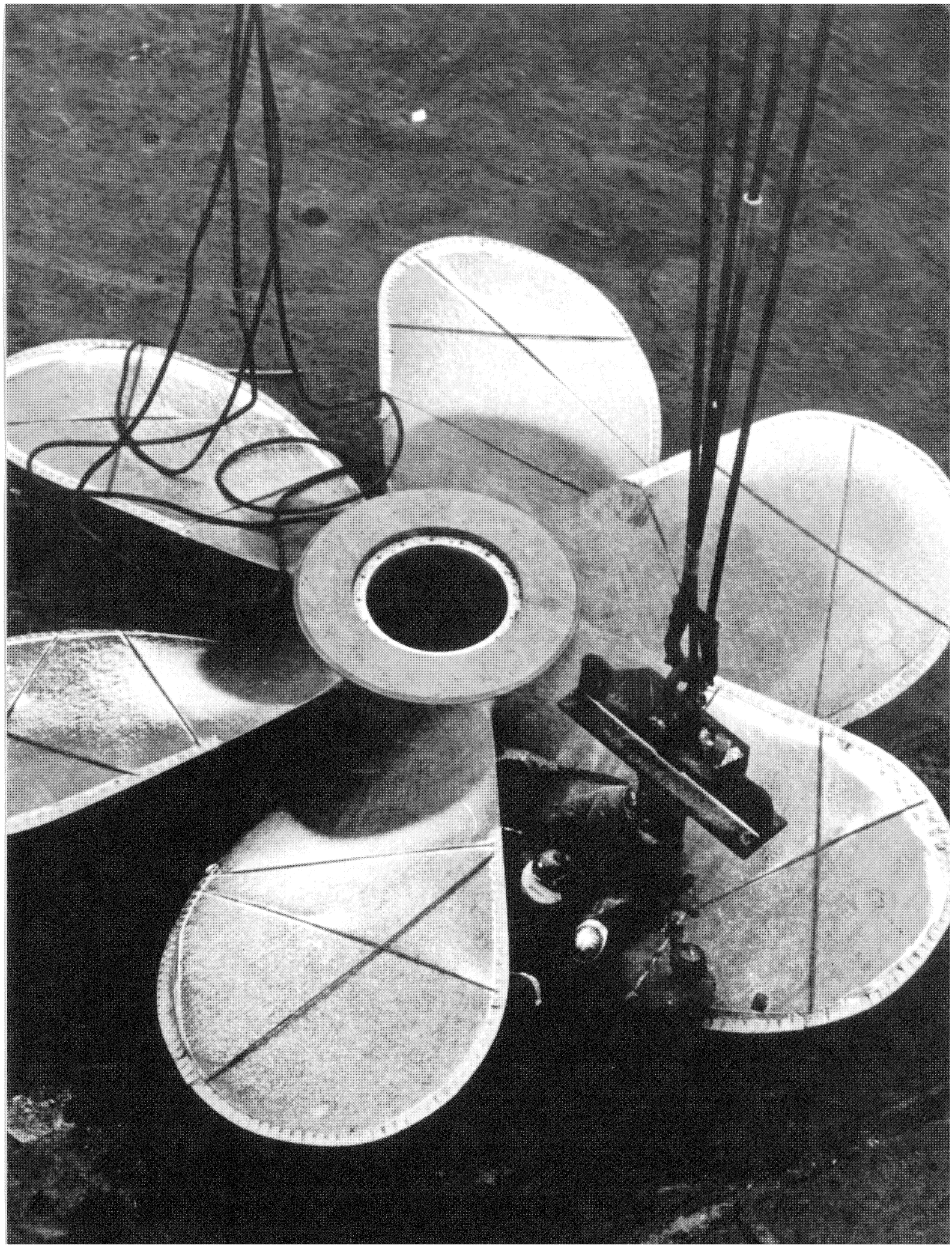
* Industry assumed a significant portion of the funding in the cost-shared Federal research and development effort to advance the technology and productivity of all segments of the merchant marine.

The report indicates that, while this vital and cyclical industry--in this as in other maritime nations--remained on the down side of the cycle, the Administration's initiatives and Congress' action in fiscal year 1978 hold the promise of achieving a cohesive national policy and a unified approach which can ensure greater progress for the U.S. merchant marine in the 1980s.

Sincerely,

Juanita M. Kreps
Secretary of Commerce

The President
President of the Senate
Speaker of the House of Representatives



INTRODUCTION

By Robert J. Blackwell

ASSISTANT SECRETARY FOR MARITIME AFFAIRS

Since the founding of this Republic, waterborne commerce has served as our basic lifeline, sustaining our Nation's economic vitality and helping to assure our national security.

The promotion of the U.S. merchant marine and America's private shipbuilding industry, in pursuit of the Government's dual objectives to maintain this ocean lifeline, is the mission of the Maritime Administration (MarAd), an Agency of the U.S. Department of Commerce since 1950.

Mission and Programs

In carrying out its mission, MarAd administers financial assistance programs for shipbuilders and ship operators; sponsors cost-shared research and development to advance the technology, competitiveness, and productivity of the maritime industry; develops promotional programs to generate shipper support for U.S.-flag vessels; promotes port development, domestic shipping, and minority business enterprise in the maritime industry; negotiates international maritime agreements and participates in international maritime forums; operates the U.S. Merchant Marine Academy at Kings Point, N.Y., and provides other maritime manpower training; and maintains a reserve fleet of merchant vessels for defense mobilization purposes at three sites on the East, Gulf, and West Coasts.

Workmen (bottom right) are dwarfed by propeller, of type used in America's very large crude carriers. This one weighs 135,870 pounds and is 30 feet in diameter.

Industry Status

In fiscal year 1978 the U.S. maritime industry remained under the adverse influence of the global shipping and economic recession stemming from the quadrupling of petroleum prices which followed the 1973-74 oil embargo. It also was adversely affected by some relatively new competitive factors on our essential foreign trade routes.

Basically, the problem remained one of more ships than cargoes available in international shipping in most of the world. This situation, as it relates to the United States—and to our traditional trading partners, became more difficult during this reporting period as a result of the rapid growth and the rate-cutting practices of government-owned and other foreign merchant fleets—chiefly cross-traders—competing for cargoes in the U.S. export-import shipping market.

Overtonnaging and unfair rate practices in our transpacific trade were responsible, in part, for the bankruptcy of one U.S.-flag liner company and caused financial difficulties for others in FY 1978.

The United States remains the world's largest trading nation. In calendar year 1977, oceanborne exports and imports (total commercial cargoes in the U.S. foreign trade) reached 775.3 million tons, valued at $171.2 billion. Both were record highs.

The American-flag share of our total foreign cargoes declined in 1977 but in the liner segment of this trade the U.S.-flag share remained at about 30 percent—8 percentage points above the level of the early 1970s.

The U.S. foreign trade charter market continued to be dominated by foreign-flag carriers. Only 3.5 percent of the petroleum and other bulk cargoes that moved in our 1977 foreign trade was carried by U.S.-flag tankers. U.S.-flag carriage of all other nonliner tonnage in our export/import trade (mostly dry-bulk) amounted to 2 percent.

At the end of the fiscal year 48 new merchant ships were under construction or on order in yards of the private U.S. shipbuilding industry, second only to Japan among the shipbuilding nations of the world.

While the U.S. orderbook declined from 60 a year earlier and some yards face an uncertain employment future, the American industry's position was relatively good compared to the situation abroad. The world orderbook as of September 30, 1978, was at its lowest level since 1965.

Tanker Situation Improves

In FY 1978 there were relatively significant improvements in the U.S.-flag tanker fleet, both in size and employment.

Twelve of the 20 new, deepdraft vessels delivered by private U.S. yards were crude oil or product tankers and 4 were liquefied natural gas (LNG) carriers. The 12 new oil/product carriers, totaling 1,541,900 deadweight tons (dwt.), comprise one of the largest yearly increases in carrying capacity ever added to the U.S.-flag tanker fleet, although its overall capacity remains far short of the Nation's economic and security requirements.

Operationally, the American-flag tanker fleet—bolstered by the Alaskan oil trade and imports of oil for the U.S. Strategic Petroleum Reserve program—was nearly 100 percent employed in FY 1978. In contrast, large segments of the tanker fleet elsewhere around the globe continued in layup. Although the world tanker glut eased in this reporting period, the future of the oil charter market was clouded generally by uncertainties in the pricing of petroleum and attendant national policy, production, and political considerations of key producing countries in the Middle East and elsewhere.

Other Positive Signs

Despite its diverse problems, there were a number of other encouraging developments in the American maritime industry in FY 1978.

The U.S. merchant fleet and shipbuilding industry's overall position, relative rank, and generally superior technology were maintained.

The privately owned, deepdraft U.S. merchant fleet (oceangoing and Great Lakes) reached a record cargo-carrying capacity of 21.6 million dwt.

The infusion of larger, faster, high-technology vessels in the fleet is largely the result of expanded Federal financial assistance and research and development (R&D) programs authorized by the Merchant Marine Act of 1970.

R&D projects were given a high priority by the Maritime Administration and cost-sharing in research by the maritime industry continued at a high level in FY 1978. This comprehensive effort has greatly enhanced the productivity and competitiveness not only of U.S. merchant ships but also America's shipyards, ports, and terminals.

In FY 1978 the Administration's maritime policy initiatives and the passage of significant, new legislation by the Congress, with commendable unanimity on the part of maritime labor and management, combined to improve the outlook for the industry, with the prospects for greater progress in the months ahead.

National Policy Review

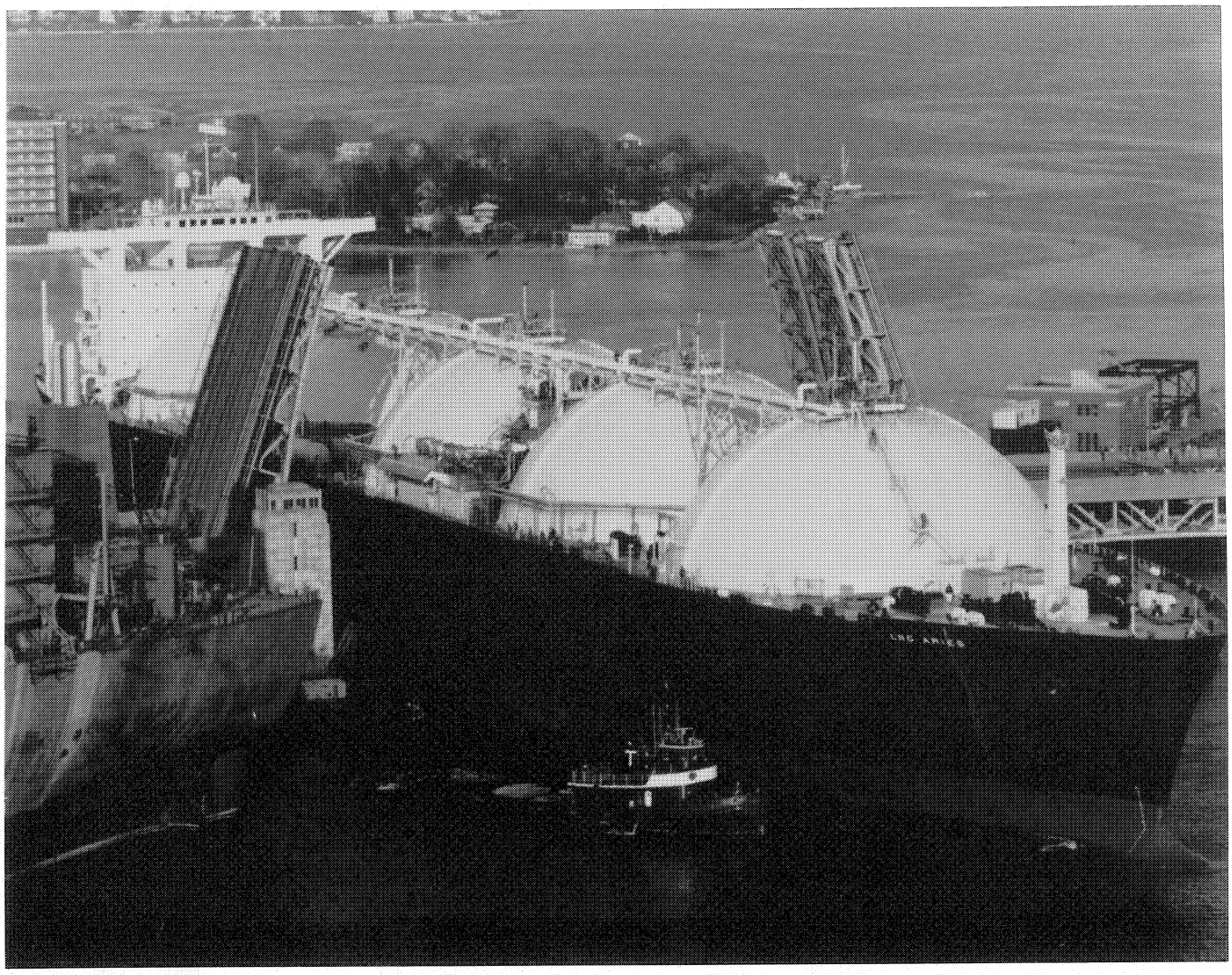
U.S. maritime policies and programs underwent a comprehensive review at the direction of the President. This examination, by an interagency task force, was initiated in March 1978 and was continuing at the end of this reporting period. The study covers the promotional programs of the Maritime Administration as well as the regulatory aspects of ocean shipping.

During the year also the Congress took note of the need for expanded statutory authority in Federal shipping regulations. It passed, and the President signed, the Ocean Shipping Act of 1978, better known as the State-Controlled Carrier Act, which provides a means to end the unfair rate-setting practices by ship operators of the Eastern bloc and other government-owned fleets.

Dry-Bulk Initiatives

In the promotional sector the Maritime Administration intensified its efforts to improve the U.S.-flag's currently critical position in the world charter market. Dry-bulk commodities constitute over 40 percent of our total U.S. foreign tonnage, yet U.S.-flag ships carry less than 2 percent of these cargoes.

MarAd has under consideration, among others, proposed regulatory changes to remove some of the constraints which currently deter potential applicants for Federal financial assistance from building U.S.-flag dry-bulk vessels.



LNG ARIES, second liquefied natural gas carrier to be delivered by General Dynamics' Quincy (Mass.) Shipbuilding Division, squeezes through drawbridge after completing her sea trials. Huge ship, with capacity of 125,000 cubic meters, will be operated under U.S. flag, carrying LNG from Indonesia to Japan.

In addition, during the year MarAd awarded a contract for the development of standard bulk carrier designs, and engaged in discussions with potential operators, shippers, and investors in an effort to solve other dry-bulk problems.

If a viable dry-bulk program emerges from these FY 78 initiatives and future initiatives, it is anticipated that significant, new dry-bulk construction—in the range of three to five ships a year—could emerge in the near term. There were only 15 active, privately owned dry-bulk ships in the U.S.-flag oceangoing fleet on September 30, 1978. (Additional information on the charter/dry-bulk market is included in Chapter 2.)

The Agency's objectives in this priority program—as in others detailed in this annual report—are to develop, promote, and maintain an American merchant marine that is in the best interest of the national economy and security at all times—a viable commercial asset in times of peace, readily available as the Nation's fourth arm of defense in times of peril.

AMERICA

Chapter 1

Shipbuilding

Contract Awards

During fiscal year 1978 the Maritime Administration (MarAd) granted construction-differential subsidy (CDS) for three new, highly productive liner vessels with a total contract value of $152.9 million. Of this amount, the Government will pay $71.6 million, including the cost of national defense features incorporated in the ships. The ships include two combination container/lighter-aboard-ship (LASH) vessels of 40,921 deadweight tons (dwt.) each for Waterman Steamship Corp. and one self-propelled, oceangoing Roll-On/Roll-Off (RO/RO) barge of 4,700 dwt. for Cumberland Shipping Co. (See Table 1 for FY 1978 contract awards and vessels under CDS contracts on September 30, 1978.)

In addition to CDS awards for the three merchant vessels, MarAd awarded a $2,875,000 contract for a crabber/trawler research vessel to be built for the National Oceanic and Atmospheric Administration, a sister agency in the Commerce Department. Bender Welding and Machine Co., Inc., received the contract under the Economy Act of 1932. MarAd designed the 127-foot, multipurpose vessel in FY 1977 and, under the interagency agreement, will monitor its construction progress through acceptance trials and delivery.

Private contracts were awarded in FY 1978 for the nonsubsidized construction of nine vessels totaling 182,200 dwt. and including two product tankers, one containership, two self-unloading Great Lakes bulk carriers, and four large self-propelled hopper dredges (see Table 2).

As of September 30, 1978, there were 48 new merchant vessels, with a total contract value of $3.1 billion and a total of 3.5 million dwt., on U.S. shipyard orderbooks. This compared to 60 vessels a year earlier. Of the 48 vessels, 24 were being built with CDS and 22 of those also were under Federal Ship Financing (Title XI) Guarantees. In addition, 11 of the remaining 24, privately financed vessels carry Title XI guarantees (for a total of 33 covered by that program).

As of September 30, 1978, 26 offshore oil-drilling rigs were on order or in production in five U.S. shipyards, compared to 15 units a year earlier.

There was one major cancellation during the year. On July 7, 1978, Zapata Ocean Carriers, Inc., Newport News Shipbuilding & Dry Dock Co., and the Maritime Administration agreed to cancel a contract for a 390,770-dwt. ultra-large crude carrier (ULCC) ordered from the Newport News shipyard. The ship was to have been built with construction-differential subsidy and Title XI mortgage guarantees which had been approved in 1974. At the time of the contract award the price of the vessel, including national defense features, was $136.6 million, with CDS amounting to $53 million.

Construction Subsidy

To reduce or eliminate the cost disparity which exists between U.S. and foreign shipbuilding prices, MarAd is authorized to pay a construction-differential subsidy.

This subsidy is the difference between the shipbuilding costs in an American shipyard and the estimated cost of constructing the same ship in a foreign shipyard, but may not in any case exceed 50 percent of the domestic shipbuilding costs. (See Appendix I for CDS expenditures since 1936.)

To be eligible for CDS, a vessel must be built in an American shipyard, owned by American citizens, manned by an American crew, and operated under the U.S. flag in the Nation's foreign commerce.

The combined construction costs of the 24 new vessels on which CDS was being paid on September 30, 1978, totaled almost $1.7 billion, of which $552 million will be paid by the Government. The new vessels being built with CDS consisted of seven liquefied natural gas (LNG) carriers, three tankers, four containerships, two LASH vessels, three general cargo vessels, two integrated tug/barge vessels, two heavylift cargo vessels, and one RO/RO barge.

There were 50 CDS applications for 143 new vessels on file at MarAd at the close of the fiscal year. However, a number of these applications have been pending for sometime and, under current criteria, were considered dormant (although subject to reactivation upon request).

Motor Vessel AMERICA, built with Federal subsidy, is launched at Equitable Shipyard, Madisonville, La. First of three 2,200-deadweight ton multipurpose cargo vessels, AMERICA will be operated by new U.S. liner company, American Atlantic Shipping, Inc., in Caribbean, Central and South American trades.

Table 1: SHIPS UNDER CDS—SEPTEMBER 30, 1978

Owner	Shipbuilder	Ship Type
Contracts Awarded in FY 1978:		
Cumberland Shipping	Seatrain Shipbuilding	RRB
Waterman Steamship	Avondale Shipyards	LASH
Total (FY 1978)		
Undelivered Vessels Under Contracts Awarded prior to FY 1978:		
American Atlantic Shipping	Equitable Shipyards	BBC
American Heavy Lift	Peterson Builders	HL
Coordinated Caribbean Transport	Manhattan Barge/Marinette	TB
El Paso Arzew	Newport News SB & DD	LNG
El Paso Columbia	Avondale	LNG
El Paso Cove Point	Avondale	LNG
El Paso Howard Boyd	Newport News SB & DD	LNG
El Paso Savannah	Avondale	LNG
Farrell Lines	Bath Iron Works	CN
Farrell Lines	Bethlehem (Sparrows Point)	CN
Fillmore Tanker	Seatrain	COT
Lachmar	General Dynamics	LNG
VLCC I	Newport News SB & DD	COT
VLCC II	Newport News SB & DD	COT
Total (Prior to FY 1978)		
Total All Ships Under CDS September 30, 1978		

No. of Ships	Total Dwt.	Estimated Completion Date	Total Estimated Cost [1] (Millions)	Estimated CDS (Millions)	Estimated Cost NDF (Thousands)
1	4,700	12-78	$ 12.8	$ 5.3	$ 43
2	81,842	7-80	140.1	65.7	518
3	**86,542**		**$152.9**	**$71.0**	**$561**
3	6,660	12-79	28.7	13.9	195
2	5,906	4-79	33.6	14.1	54
2	13,542	1-79	42.4	16.2	-0-
1	63,460[2]	12-78	96.8	25.3	17
1	63,170[2]	12-79	106.0	17.5	20
1	63,170[2]	5-79	100.0	16.5	20
1	63,460[2]	6-79	94.2	24.5	18
1	63,170[2]	12-78	103.0	17.0	20
2	32,686	2-80	86.4	42.8	182
2	54,680	9-79	156.8	77.8	72
1	225,000	12-78	70.6	28.8	63
2	127,200[2]	3-80	310.0	79.0	-0-
1	390,770	3-79	139.7	54.1	66
1	390,770	12-79	138.2	53.5	58
21	**1,563,644**		**$1,506.4**	**$481.0**	**$ 785**
24	**1,650,186**		**$1,659.3**	**$552.0**	**$1,346**

[1] Total contract cost including CDS and National Defense Features (NDF), but excluding engineering and change orders.
[2] 125,000 cubic meters per ship.
Key to Ship Types: CN = containership, COT = crude oil tanker, LNG = liquefied natural gas carrier, TB = integrated tug/barge vessel, BBC = breakbulk carrier, HL = heavylift cargo vessel, LASH = lighter aboard ship, RRB = self-propelled RO/RO barge.

Champagne fills air (above) as SS B.T. ALASKA is christened in January 1978 at National Steel and Shipbuilding Co., San Diego. B.T. ALASKA, shown at right underway 3 months later with her first load of Alaskan crude oil, and her sister ship, B.T. SAN DIEGO (delivered later in 1978) are largest vessels to be built on West Coast. Both were designed and built by NASSCO for General Electric Credit Corp. for charter by Shell Oil Co. in the Alaska-lower 48 States oil trade. Participating in christening ceremony (from left) are Mrs. William P. Gwinn, sponsor; C. Larry French, NASSCO president; and Mrs. John F. Bookout, matron of honor.

Table 2: PRIVATE CONSTRUCTION CONTRACTS AWARDED IN FY 1978

Owner	Shipbuilder	Type	No. Vessels	Total Dwt.	Estimated Completion Date	Total Estimated Cost (Millions)
Matson Navigation	Sun Ship	Containership	1	26,600	1980	$ 75.5
Sun Ship Affiliate	Sun Ship	Product Tankers	2	62,000	1979	72.0
Interlake SS Co.	Amer. SB Co.	Great Lakes Bulk Carrier	1	61,000	1979	45.0
Cooper SS Co.	Bay SB	Great Lakes Bulk Carrier	1	32,600	1980	35.0
North American Trailing	Southern SB	Dredge	1	N.A.	1979	14.0
Corps of Engineers	Norfolk SB	Dredge	1	N.A.	1978	14.0
Eagle Dredging	Avondale	Dredge	1	N.A.	1981	37.9
Corps of Engineers	Avondale	Dredge	1	N.A.	1981	67.5
Total Private Contracts, FY 1978			**9**	**182,200**		**$360.9**

Ship Deliveries

Twenty new vessels totaling 1.9 million dwt. were delivered by American shipyards during FY 1978 (see Table 3). Subsidized reconstruction work was completed on four additional ships—the AUSTRAL ENVOY, owned by Farrell Lines, Inc., and the GOLDEN BEAR, JAPAN BEAR, and THOMAS E. CUFFE, owned by Pacific Far East Line, Inc.

The following four new subsidized vessels were delivered during the fiscal year:

- The 265,000-dwt. crude oil tanker AMERICAN INDEPENDENCE to Gulf Oil Corp., for worldwide service;
- The 125,000-cubic-meter liquefied natural gas carriers LNG ARIES and LNG CAPRICORN to Wilmington Trust Co. (for bareboat charter to Summit II, Inc., and Summit III, Inc., respectively), for service between Indonesia and Japan; and
- The 125,000-cubic-meter liquefied natural gas carrier EL PASO SOUTHERN to El Paso Southern Tanker Co. for Algeria/U.S. East Coast service.

Delivery of these four vessels brought to 46 the number of subsidized ships contracted for and completed since enactment of the Merchant Marine Act of 1970. However, CDS on the LNG ARIES and LNG CAPRICORN is being repaid in connection with their entry into service between Indonesia and Japan.

During the fiscal year U.S. shipyards also delivered the following 16 vessels built without subsidy:

- Four 164,000-dwt. crude oil tankers to Shipco (for long-term charter to a subsidiary of Standard Oil Co. of Ohio (SOHIO) for Alaska/U.S. West Coast service);
- Three 89,700-dwt. crude oil tankers for bareboat charter to Shipmor Associates, for Alaska/U.S. West Coast service;
- One 188,500-dwt. crude oil tanker to General Electric Credit Corp. (for long-term charter to Shell Oil Co.), for Alaska/U.S. West Coast service;
- One 125,000-cubic-meter LNG carrier to Patriot I Shipping Corp., for service between Indonesia and Japan;
- One 118,300-dwt., double-hull crude oil tanker to Shipco (for long-term charter to a subsidiary of SOHIO, for Alaska/U.S. West Coast service);
- One 35,000-dwt. product tanker for bareboat charter to Chevron Shipping Co., for the U.S. Pacific Coast trade;
- One 10,000-dwt. product tanker to Cleveland Tankers, Inc., for the Great Lakes trade;
- One 26,600-dwt. containership to Matson Navigation Co., for U.S. West Coast/Hawaii service;
- One 62,600-dwt. self-unloading bulk carrier to Bethlehem Steel Corp., for the Great Lakes trade;
- One 23,300-dwt. self-unloading bulk carrier to American Steamship Co., for the Great Lakes trade; and
- One 22,500-dwt. integrated tug-barge to CF Industries, for the U.S. coastal trade.

Deliveries of merchant vessels by major shipbuilding nations during calendar year 1977 are shown in Table 4.

Title XI Guarantees

Title XI of the Merchant Marine Act of 1936 established the Federal Ship Financing Guarantees Program.

As originally enacted, Title XI authorizes the Secretary of Commerce, acting by and through the Maritime Administrator (now the Assistant Secretary of Commerce for Maritime Affairs), to insure loans or mortgages made to finance or refinance the construction or reconstruction in U.S. shipyards of American-flag vessels. In 1972, Title XI was amended to provide direct Government guarantee of the underlying debt obligations for future transactions.

In the event of default by the vessel owner, the U.S. Government insures or guarantees full payment to the lender of the unpaid principal and interest of the mortgage or obligation.

During FY 1978 the Agency conditionally approved Title XI guarantees of $430.7 million covering 275 vessels (see Table 5).

Based on previous Title XI commitments, insurance and guarantees were placed on 421 vessels during FY 1978.

As of September 30, 1978, Title XI guarantees in force amounted to nearly $5.7 billion. Pending applications on that date represented potentially about $4.6 billion in additional guarantees (see Table 6).

During this reporting period the Congress increased the Title XI ceiling from $7 billion to $10 billion, empowering MarAd to guarantee $9,925,000,000 in merchant vessel financing (with the balance allocated for fishing vessels).

The self-sustaining Title XI program has been one of the most successful under the 1936 act. Its total costs, including salaries of the MarAd staff employed in the merchant ship-financing program, are underwritten by fees which are paid by users. These insurance premiums and guarantee fees go into the Federal Ship Financing Fund, which is a Revolving Fund for payment of the defaults.

In the 40-year history of the Title XI program, only 10 companies had defaulted prior to this reporting period. In FY 1978 payments of approximately $104 million were made to satisfy the Title XI guarantees on four liner cargo vessels and 802 LASH barges of Pacific Far East Line, Inc., which was adjudicated as bankrupt August 4, 1978. The Agency expects to recover a substantial portion of these funds upon sale of these vessels, wtih losses anticipated at approximately $35 million.

During FY 1978 the Federal Ship Financing Revolving Fund had total income of $43,923,741.

Table 3: NEW SHIPS DELIVERED FROM U.S. SHIPYARDS DURING FY 1978

Owner*	Builder	Type	Vessels
Subsidized			
Gulf Oil Corp.	Bethlehem (Sparrows Point)	Crude Oil Tanker	1
El Paso Southern Tanker Co.	Newport News SB & DD	LNG Carrier	1
Wilmington Trust Co. (Summit II, Inc.)	Gen. Dynamics (Quincy)	LNG Carrier	1
Wilmington Trust Co. (Summit III, Inc.)	Gen. Dynamics (Quincy)	LNG Carrier	1
	Total Subsidized Deliveries		**4**
Nonsubsidized			
SOHIO Subsidiaries	Avondale Shipyards	Crude Oil Tankers	4
Manufacturers Hanover Trust Co. (Shipmor Associates)	National Steel & SB	Crude Oil Tankers	3
General Electric Credit Corp. (Shell Oil Co.)	National Steel & SB	Crude Oil Tanker	1
Patriot I Shipping Corp.	Gen. Dynamics (Quincy)	LNG Carrier	1
SOHIO Subsidiary	Sun Ship	Crude Oil Tanker	1
Standard Oil Co. of Calif.	FMC	Product Tanker	1
Cleveland Tankers, Inc.	Levingston SB	Product Tanker	1
Matson Navigation Co.	Bath Iron Works	Containership	1
Bethlehem Steel Corp.	Bay Shipbuilding	Bulk Carrier	1
American Steamship Co.	Bay Shipbuilding	Bulk Carrier	1
CF Industries	Avondale/Peterson Builders	Tug/Barge	1
	Total Nonsubsidized Deliveries		**16**
Total New Ships Delivered FY 1978			**20**

* Bareboat charterer is shown in parentheses if owner is a bank.

Table 4: WORLDWIDE SHIP DELIVERIES—CALENDAR YEAR 1977 (TONNAGE IN THOUSANDS)

Country of Construction	Total All Types No.	Total All Types Dwt.	Combination Pass. & Cargo No.	Combination Pass. & Cargo Dwt.	Freighters No.	Freighters Dwt.	Bulk Carriers No.	Bulk Carriers Dwt.	Tankers No.	Tankers Dwt.
Total	**1,364**	**44,977.7**	**4**	**6.8**	**684**	**7,233.7**	**450**	**16,218.0**	**226**	**21,519.2**
United States	17	1,621.8	—	—	2	37.0	—	—	15	1,584.8
Brazil	21	544.5	—	—	12	99.5	9	445.0	—	—
Denmark	32	1,211.6	1	2.5	20	165.4	5	243.8	6	799.9
France	27	1,555.7	1	.7	15	197.5	—	—	11	1,357.5
Germany, East	30	387.1	—	—	26	298.0	4	89.1	—	—
Germany, West	89	2,248.3	—	—	66	702.2	9	586.3	14	959.8
Italy	19	1,094.1	—	—	5	64.0	5	520.9	9	509.2
Japan	670	19,744.4	—	—	287	3,453.7	320	10,507.4	63	5,783.3
Korea, South	39	1,173.8	—	—	23	307.9	12	273.8	4	592.1
Netherlands	41	275.4	—	—	38	195.4	—	—	3	80.0
Norway	49	752.8	1	1.7	25	170.1	4	188.6	19	392.4
Poland	30	659.6	—	—	18	215.4	6	237.6	6	206.6
Spain	60	3,227.7	—	—	37	367.0	8	157.3	15	2,703.4
Sweden	32	4,002.4	—	—	3	15.1	6	628.5	23	3,358.8
United Kingdom	48	2,466.9	—	—	24	350.1	13	549.2	11	1,567.6
U.S.S.R.	31	395.5	—	—	21	134.1	6	41.2	4	220.2
Yugoslavia	13	682.3	—	—	3	45.4	8	575.6	2	61.3
All Others	116	2,933.8	1	1.9	59	415.9	35	1,173.7	21	1,342.3

Table 5: SHIP FINANCING GUARANTEES—COMMITMENTS APPROVED IN FY 1978 [1]

Number	Type	Company	Amount Guaranteed
Deepdraft Vessels:			
1	Tanker	667 Leasing Co.	$ 42,850,000
2	Cargo	Waterman Steamship	60,000,000
1	Cargo	Lawrence Steamship	16,480,882
4		**Total Deepdraft Vessels**	**$119,330,882**
Other Types:			
Ocean:			
1	Tug	Moody Offshore Inc.	$ 1,875,000
1[2]	Barge	Construction Aggregates Corp.	1,727,000
1	Barge	Montauk Oil Trans. Corp.	4,235,000
1	Barge	Cumberland Shipping Co.	6,574,000
6	Barges	Ultramar Partners	5,755,000
1	Barge	Dillingham Tug & Barge	1,281,000
2	Barges	Foss Launch & Tug	2,765,044
1	Tug	Morania Tug & Barge, Inc.	1,264,368
1	Barge	Morania Tug & Barge, Inc.	1,735,632
3	Barges	Marine Leasing Corp.	3,450,000
2	Barges	Marine Leasing Corp.	2,542,750
1	Tug	Dotco One, Inc.	2,247,000
1	Barge	Dotco One, Inc.	2,600,000
2	Tugs	Robin Towing Corp.	3,655,144
1	Tug	Suwannee River Lines, Inc.	9,075,000
1	Barge	Suwannee River Lines, Inc.	16,853,000

Table 5: (Continued)

Number	Type	Company	Amount Guaranteed
1	Tug	Suwannee River SPA Lines, Inc.	9,075,000
1	Barge	Suwannee River SPA Lines, Inc.	16,853,000
1	Tug	Suwannee River Phosphate Lines, Inc.	9,075,000
1	Barge	Suwannee River Phosphate Lines, Inc.	16,853,000
29		**Total Ocean**	**$119,490,938**
River:			
58	Barges	Union Mechling Corp.	$ 11,150,000
40	Barges	Port City Barge Line	7,481,000
112	Barges	Canal Barge	19,018,000
1	Tug	Foss Launch & Tug	1,292,956
2	Barges	K.A. Steel Chemicals, Inc.	1,015,000
213		**Total River**	**$ 39,956,956**
Drill Service:			
2	Tug/Supply Vessels	Acadian Supply Ships Assoc.	$ 4,467,160
1	Tug/Supply Vessel	Offshore Supply Ships	1,650,000
4	Tug/Supply Vessels	Arthur Levy Enterprises	7,350,000
3	Tug/Supply Vessels	Garber Brothers, Inc.	5,778,000
2	Tug/Supply Vessels	Point Marine, Inc.	3,471,000
4	Tug/Supply Vessels	Offshore Logistics	10,000,000
2	Tug/Supply Vessels	First Seal, Inc.	3,925,250
2	Crew Boats	Robin Towing	877,547
20		**Total Drill Service**	**$ 37,518,957**
Drill Ships:			
1	Jackup Drill Rig	Storm Marine Ltd.	12,000,000
1	Jackup Drill Rig	Western Co. of North America	19,500,000
1	Jackup Drill Rig	Western Co. of North America	19,500,000
1	Jackup Drill Rig	Chiles Offshore Ltd.	9,941,000
1	Jackup Drill Rig	Noble-National Joint Venture	11,256,000
2	Jackup Drill Rigs	Inland Well Service, Inc.	7,767,114
7		**Total Drill Ships**	**$ 79,964,114**
Miscellaneous:			
1	Pipelay Barge	Pipelines, Inc. of Harvey	$ 1,213,013
1	Self-Propelled Hopper Suction Dredge	Eagle Dredging Corp.	33,195,000
2		**Total Miscellaneous**	**$ 34,408,013**
275		**Total Commitments (All Vessels)**	**$430,669,860**

[1] Note: Some numbers have been rounded to nearest dollar.
[2] Not included in ship count; involved second mortgage.

Table 6: FEDERAL SHIP FINANCING GUARANTEES (TITLE XI) PROGRAM SUMMARY
(Statutory Limit $9.925 Billion) Principal Liability on September 30, 1978

	Contracts in Force		Applications Pending	
Vessel Types	Vessels Covered	Principal Amount*	Vessels Covered	Principal Amount*
Deepdraft:				
Tankers	63	$1,141,749,229	7	$ 369,352,000
Cargo	163	945,652,292	31	706,076,525
LNGs	16	1,395,446,400	21	2,318,710,750
Bulk/OBOs	15	221,791,934	16	219,490,750
Total	**257**	**$3,704,639,855**	**75**	**$3,613,630,025**
Other:				
Drill Rigs/Ships	50	695,787,998	11	177,261,240
Tugs/Barges/Drill Service	2,082	1,134,978,017	350	706,126,367
Miscellaneous	6	80,812,866	9	115,074,760
Total	**2,138**	**$1,911,578,881**	**370**	**$ 998,462,367**
TOTAL VESSELS	**2,395**	**$5,616,218,736**	**445**	**$4,612,092,392**
SHIPBOARD LIGHTERS	**1,732**	**$ 62,767,990**	**0**	
TOTAL	**4,127**	**$5,678,986,726**	**445**	**$4,612,092,392**

* Rounded to the nearest dollar.

Table 7: CAPITAL CONSTRUCTION FUND HOLDERS—SEPTEMBER 30, 1978

Aeron Marine Shipping Co.
Alaska Aggregate Corp.
Amak Towing Co., Inc.
American President Lines, Inc.
Aquarius Marine Co.
Ashland Oil, Inc.
Atlantic Richfield Co.
Atlas Marine Co.
Bankers Trust New York Corp.
Bethlehem Steel Corp.
Bob-Lo Co.
Bultema Dock and Dredge Co.
Campbell Towing Co.
Cement Transit Co.
Central Gulf Lines, Inc.
Citimarlease (Burmah I), Inc.
Citimarlease (Burmah Liquegas), Inc.
Citimarlease (Burmah LNG Carrier), Inc.
Citimarlease (Fulton), Inc.
Citimarlease (Whitney), Inc.
The Cleveland-Cliffs Iron Co.
Coastal Barge Lines, Inc.
Cook Inlet Tug & Barge Co., Inc.
Crowley Maritime Corp.
Delta Steamship Lines, Inc.
Dillingham Tug & Barge Corp.
El Paso Arzew Tanker Co.
El Paso Columbia Tanker Co.
El Paso Cove Point Tanker Co.
El Paso Howard Boyd Tanker Co.
El Paso Savannah Tanker Co.
El Paso Southern Tanker Co.
Erie Navigation Co.
Exxon Corp.
Farrell Lines Inc.
Ford Motor Co.
Foss Alaska Line, Inc.
Foss Launch and Tug Co.
Fred Devine Diving & Salvage, Inc.
GATX Corp.
General Marine, Inc.
Globe Seaways, Inc.
The Great Lakes Towing Co.
Hannah Brothers
Hannah Inland Waterways Corp.
Houston Natural Gas Corp.
Inland Steel Co.
Intercontinental Bulktank Corp.
Interstate Marine Transport Co.
Interstate Towing Co.
Luedtke Engineering Co.
Lykes Bros. Steamship Co., Inc.
Madeline Island Ferry Line, Inc.
Marine Leasing Corp.
Matson Navigation Co.
Moore McCormack Resources, Inc.
National Gypsum Co.
Neuman Boat Line, Inc.
Nolty J. Theriot, Inc.
Ocean Tankships Corp.
Oceanic Partners
Ogden Corp.
Oglebay Norton Co.
Ohio Barge Line, Inc.
O.L. Schmidt Barge Lines, Inc.
Overseas Bulktank Corp.
Pacific Far East Line, Inc.
Pacific Towboat & Salvage Co.
Prudential Lines, Inc.
Ritchie Transportation Co.
Robin Towing Corp.
S & E Shipping Corp.
Sun Co., Inc.
TTT, Inc.
Tidewater, Inc.
Transway International Co.
Union Oil of California
United States Lines, Inc.
United States Steel Corp.
United Tanker Corp.
Warrior & Gulf Navigation Co.
Washington Island Ferry Line
Waterman Steamship Co.
Worth Oil Transport Co.
Young Brothers, Ltd.
Zidell, Inc.

Capital Construction Fund

Since the Capital Construction Fund (CCF) Program was established under the Merchant Marine Act of 1970, CCF has become one of the major Federal aid programs extended to the many sectors of the U.S. merchant marine. CCF assists operators in accumulating capital to build, acquire, and reconstruct vessels through the deferment of Federal income taxes on eligible deposits. With today's high costs for ship construction, the availability of the CCF as a source of capital has taken on significant importance.

During the fiscal year $202 million was deposited in these accounts. Since the inception of this program in the fall of 1971, $1.4 billion has been deposited in CCF accounts and over $1 billion has been utilized for the modernization and expansion of the United States merchant marine.

The CCF program has broad applicability which enables operators to build vessels for the U.S. foreign trade, the Great Lakes trade, the noncontiguous domestic trade, or the fisheries of the United States. Thus, vessels built under this program span a wide spectrum including large container ships, tankers, sophisticated LNG vessels, self-unloading Great Lakes bulk carriers, integrated tug/barge units, offshore vessels, and barges.

The total value of construction projects planned by the 86 fundholders (listed in Table 7) over the next 20 years is $6.9 billion. By operating area, $5.5 billion of construction is projected for the U.S. foreign trade, $764 million for the Great Lakes trade, and $601 million for the noncontiguous domestic trades.

Tanker BROOKS RANGE, one of four 165,000-dwt. ships delivered by Avondale Shipyards to subsidiaries of Standard Oil Co. (Ohio) in FY 1978. Built for Alaskan oil trade, all four utilized Federal ship financing guarantees provided under Title XI of Merchant Marine Act of 1936, as amended.

Construction Reserve Fund

The Construction Reserve Fund (CRF), like the CCF, encourages the upgrading of the U.S.-flag fleet. The CRF program permits eligible parties to defer the taxation of gain on the sale or other disposition of a vessel if the net proceeds from the transaction are deposited in a CRF and reinvested in a new vessel within 3 years. Because its benefits are not so broad as those of the CCF program, the CRF is used predominantly by owners of vessels operated in coastwise trades, on the inland waterways, or in other trades not eligible for the CCF program.

At the beginning of FY 1978, nine companies maintained CRFs with a total balance on deposit of approximately $6.1 million. Six companies deposited a total of $1 million during the fiscal year. Of the depositors, three companies opened new CRFs and two firms completed their CRF objectives and exhausted their funds. Withdrawals totaled $3.5 million. At the close of FY 1978, 10 companies maintained CRF balances totaling $3.6 million (see Table 8).

Capital Reserve Fund

During FY 1978 the sole remaining Capital Reserve Fund was phased out and the program terminated, as required by the Merchant Marine Act of 1970.

This fund was established by the 1936 act as a tax-deferral program for operators of U.S.-flag general cargo and passenger vessels receiving operating-differential subsidy (ODS). Those operators were required to accumulate the capital necessary for the construction of replacement vessels. They also were allowed to reconstruct existing subsidized vessels or use the funds to pay the mortgage indebtedness on vessels. The Capital Reserve Fund was available only to ODS operators and, accordingly, the program was limited.

The 1970 act, as noted earlier in this chapter, established the Capital Construction Fund, replacing the

Capital Reserve Fund and extending tax-deferral privileges to the broad spectrum of U.S.-flag operators, including those in the domestic trades. The law permitted Capital Reserve Fund holders to convert from the old to the new system immediately or after their then-current ODS agreements expired. The last of those contracts expired in FY 1978.

Ship Design and Engineering

As a part of the Agency's continuing effort to maintain a mobilization base for merchant shipping in the event of a national emergency, in FY 1978 MarAd carried through the preliminary design phases the development of a multipurpose cargo liner. The purpose of this program is to develop a modern, standby ship design which would be suitable for rapid series construction in the event of a national emergency.

One of the liner design's key features is flexibility in handling cargo. It would provide both RO/RO and lift-on/lift-off access to all cargo areas of the ship, enabling everything from small breakbulk lifts to as much as 140-ton heavy lifts to be handled. To speed up the load-discharge time and enhance the handling of mechanized military vehicles, sideports and a slewing stern ramp have been incorporated in the design.

It also would permit containers to be handled in cells, as on a containership, or the same spaces to be used for RO/RO cargoes.

The hull and engine room have been designed to accommodate a range of propulsion plants including steam turbine, gas turbine, medium-speed diesel, and slow-speed diesel.

During the year MarAd completed a model testing program which refined the hull form for high-propulsive efficiency and good seakeeping characteristics. Trial speed exceeds 20 knots for all designs.

Optional configurations and features for the multipurpose vessel include a jumbo version which is derived by inserting a 110-foot midbody into the basic ship, more extensive use of kingposts and booms in lieu of cranes, an alternative stern ramp configuration, and a full containership arrangement. All options of the multipurpose ship can carry liquid cargo, such as naval distillates, permitting underway replenishment of naval ships.

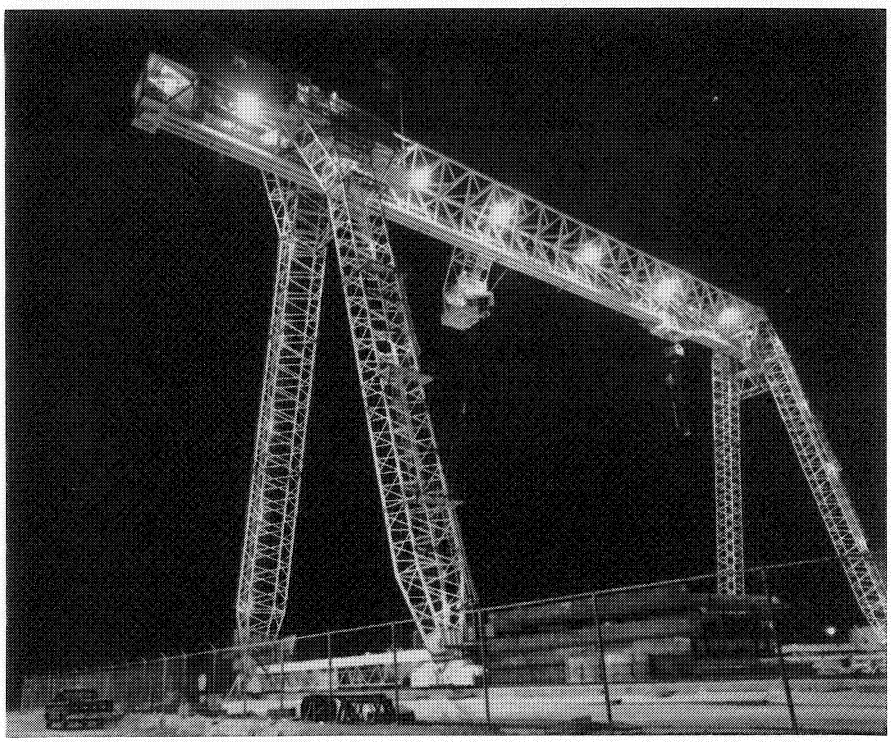
Planning was initiated during FY 1978 for a Government/Industry Mobilization Ship Conference, for the presentation of these designs to the maritime industry and Department of Defense officals and to encourage commercial construction.

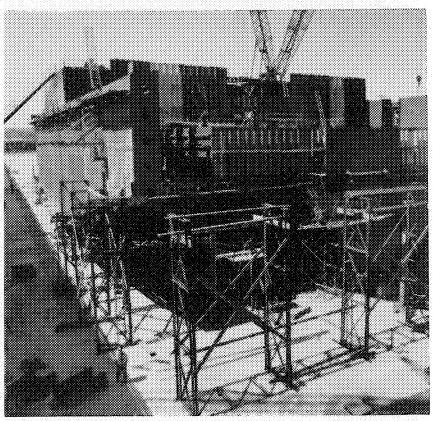
The ultimate goal is to build and operate a prototype in order to assure that a suitable design exists and can be placed into large-scale production on short notice.

During the year MarAd also completed a conceptual design study that investigated the utility of the tug-barge concept as another type of mobilization ship design. The mobilization tug-barge concept appears to be particularly promising for construction on the Great Lakes.

During FY 1978 MarAd provided the following ship-design assistance to other Government agencies:

- A study entitled "Concept Design of a Fireboat for the Hampton Roads Area (PD-224)" was completed for the U.S. Coast Guard. This design describes a high-speed, semiplaning, steel-hulled, jet-propelled fireboat of approximately 100 feet in length. The main fire-fighting feature is an elevating tower with a remotely controlled fire nozzle which makes this vessel ideally suited for fighting fires, including flaming oil and gas on tankers with decks high above the waterline.
- Design work was begun on a 90-foot fisheries research shrimpboat for NOAA. (MarAd's responsibilities will be similar to those for the 127-foot combination crabber/trawler discussed above under Contract Awards.)
- Design work which began in FY 1977 was completed on an 1,800-ton Small Waterplane Area Twin Hull (SWATH) vessel for the U.S. Naval Sea Systems Command. The vessel was designed to tow a sonar for undersea surveillance.
- An analysis was performed on the Italian oil tanker SS SAN GIUSTO for the U.S. Department of Justice. The purpose was to assess the adequacy of the vessel's mooring arrangement which, after a squall, caused winch brakes to give way during cargo oil transfer and resulted in an oil spill.





SHIPBUILDING ON GREAT LAKES—Busy U.S. shipyards on Great Lakes delivered 3 vessels in 1978 and had 10 others on order or under construction at year's end. Much of activity is centered at Sturgeon Bay, Wis., home of both Bay Shipbuilding Corp. (opposite page) and Peterson Builders, Inc. (right). Aerial view at top left shows bulk carrier EDWIN H. GOTT under construction (lower left), LEWIS WILSON FOY (in next berth), and BELLE RIVER (far right). Bay Shipbuilding's 200-ton Goliath gantry crane (in detail at lower left) spans yard's new 1,150-foot graving dock like tinkertoy watchdog, while work proceeds (lower right) on stern section of 1,000-foot self-unloader like the giant carriers pictured in aerial. At Peterson Builders (this page) Motor Vessel JOHN HENRY undergoes heavy-lift testing. JOHN HENRY is one of two heavy-lift cargo vessels being built by Peterson for American Heavy Lift Shipping Co., a joint venture of Gulf Oil Corp. and Hansa Lines.

In support of its ship design and engineering programs, MarAd maintains automated data processing activities for computer-aided ship design technical review, as well as mobilization and ship production studies. The Agency participates in computer-aided technology transfer with private industries and other Government agencies.

During the fiscal year MarAd took the following actions pertaining to U.S.-built ships: (1) published a new CDS spare-parts allowance policy and also promulgated a new policy permitting foreign-manufactured components to be incorporated in slow-speed marine diesel engines for ships built with CDS as a transition measure to achieve full domestic manufacturing capability; (2) continued pollution prevention work, including preparation of a MarAd publication titled *A Study of the Effect of the Tanker Safety and Pollution Prevention Conference on the U.S.-Flag Fleet;* and (3) assisted the U.S. Coast Guard in developing technical requirements of collision-avoidance aids for submission to the Intergovernmental Maritime Consultative Organization.

Value Engineering

By promoting the development and application of design and engineering innovations, MarAd's Value Engineering Program attempts to lower the cost of ship construction without impairing essential vessel design characteristics.

Potential savings of $135,000 were achieved in FY 1978. Since the program's inception in 1957 cumulative savings have amounted to $32 million—an average of more than $1.5 million per year.

Shipyard Improvements

Although economic uncertainties in the worldwide shipbuilding market continued, in this reporting period the American shipbuilding and ship repair industry invested some $176 million in facilities modernization and capital improvements, and as of July 1, 1978, planned to spend an additional $190 million to improve facilities during the year ending June 30, 1979.

The Merchant Marine Act of 1970 shifted the emphasis in U.S. shipyard investments from replacement to modernization and expansion, with emphasis recently on expanded ship repair and conversion facilities. Since enactment of the act the shipbulding industry has invested approximately $1.5 billion in facilities modernization and improvements, such as new building basins and floating drydocks, cranes of unprecedented lifting capacity, plus the introduction of automated equipment and highly

Table 8: CONSTRUCTION RESERVE FUNDS—SEPTEMBER 30, 1978

Company	Balance
Asphalt Barge Corporation	$ 357,842
Bud's Boat Rental, Incorporated	70,161
Central Gulf Steamship Corp.	1,000
Gulf Mississippi Marine Corp.	100
Intercity Barge Company, Inc.	55,079
Joan Turecamo, Inc.	332,500
Kathleen Turecamo, Inc.	681
Keystone Tankship Corporation	423,376
NMS Chemical Corporation	608,321
National Marine Service Incorporated	1,706,334
Total September 30, 1978	**$3,555,394**
Net Decrease Fiscal Year 1978	**$2,532,352**

mechanized production systems. Emphasis has been on the prefabrication of large subassemblies and pre-outfitting of components using modular techniques. Through these investments, the industry has increased both its capacity and its capability. This higher productivity has strengthened the U.S. shipbuilding base.

EEO In Shipyards

Minority group members and women made significant employment gains in this reporting period and in the decade, during which MarAd was responsible for ensuring that Government contractors in the maritime industries provide equal employment opportunities (EEO) to all Americans regardless of race, color, religion, sex, or national origin. Along with most other Federal monitoring of EEO activities in industry, this function was transferred to the U.S. Department of Labor in FY 1979.

Through its Office of Civil Rights, from 1969 through 1978, MarAd conducted EEO compliance reviews at contractor facilities to audit employment practices and affirmative action programs. Where discriminatory practices were encountered, corrective programs were initiated. The ship construction and repair facilities monitored by MarAd account for 80 percent of the industry's total employment.

While total shipyard employment between 1969 and 1978 increased by 13.9 percent to 126,980 employees, minority group employment rose by 73.6 percent to 38,043 employees, and the employment of women rose 170.5 percent to 11,325.

Minorities represented 30 percent of shipyard employment in 1978, compared to 19.7 percent in 1969.

Minority representation in skilled jobs and white-collar salaried jobs—both indicators of progress in the quality of jobs held—also improved. In 1978 minority employees accounted for 32.8 percent of the skilled workforce as compared to 17.8 percent in 1969. The numerical increase translates into a gain of 103 percent by minority workers, while the total skilled category increased by only 9.8 percent. Minority white-collar salaried representation increased to 11.9 percent in 1978 from 4.1 percent in 1969. The numerical gain translates into a 220.2 percent increase for minorities while the total in this category increased by only 11.4 percent.

In 1978 there were 11,325 women comprising 8.9 percent of the shipyard workforce, compared to 4,187 women comprising 3.8 percent in 1969. In blue-collar jobs, women held 6.3 percent of the positions in 1978 compared to 0.2 percent in 1969. The number of women in skilled and semiskilled shipyard jobs also increased significantly, rising from 95 in 1969 to 4,345 in 1978.

EL PASO SOUTHERN, built with Federal assistance at Newport News Shipbuilding and Dry Dock Co. for El Paso Southern Tanker Co., was among four liquefied natural gas (LNG) carriers delivered by private U.S. shipyards in FY 1978.

Minority Business Enterprise Program

The Maritime Administration Minority Business Enterprise Program, begun in 1974, encourages shipbuilding and shipping companies to use minority suppliers and vendors and advises the minority community of the opportunities for sales to the maritime industry. When the program began there was little or no record-keeping by the companies with respect to their minority business purchases. It is estimated that less than $1 million per year of business was transacted by maritime companies with minority entrepreneurs prior to 1974. By FY 1976 the industry was doing more than $11 million worth of business annually with minority firms and in FY 1978 the total increased to approximately $20 million.

The program is coordinated closely with the Office of Minority Business Enterprise, another agency in the Department of Commerce. One of the joint efforts of the agencies in this reporting period was the development of a film, "Lighthouse on the Shore," which shows the successes of several minority firms competing in the maritime industry.

As part of its ongoing effort, MarAd also plays a leading role in Federal Executive Board Minority Programs throughout the Nation.

Gulf

Chapter 2

Ship Operations

On September 30, 1978, the U.S.-flag privately owned, deepdraft merchant fleet (including the Great Lakes fleet listed in Table 18) totaled 745 vessels with a record U.S. cargo carrying capacity of 21.6 million deadweight tons (dwt.).

This segment of the U.S. fleet included 586 oceangoing vessels of 18.7 million dwt. (see Table 9), with 532 ships in active status and 54 vessels in an inactive status; an average deadweight of about 32,000 tons, an average age of 17 years; and an average speed of about 18 knots.

The active oceangoing fleet, totaling approximately 17.4 million dwt., included 123 freighters, 254 tankers, 15 bulk carriers, 128 intermodal vessels (containerships, barge-carrying vessels, and RO/RO vanships), 4 combination passenger/cargo ships, and 8 integrated tug/barge vessels.

Of the 54 vessels in an inactive status, 33 were laid up and 21 were temporarily inactive, either awaiting cargoes or undergoing repairs.

AMERICAN INDEPENDENCE, 265,000-dwt. crude oil carrier, constructed at Bethlehem Steel's Sparrows Point (Md.) shipyard, wen into operation this fiscal year. This tanker and her Gulf Oil sistership, AMERICAN SPIRIT, were largest merchant ships built in U.S. yard at time they were delivered in FY 1978 and FY 1977, repectively.

Employment of the U.S.-flag oceangoing merchant fleet as of September 30, 1978, is shown in Table 10. The privately owned fleet maintained its 10th place rank on a tonnage basis but declined to 11th place on the basis of the number of ships among merchant fleets of the world (see Table 11). However, in terms of average deadweight, the United States ranked fifth, moving up from sixth a year earlier.

In calendar year 1977, 21 subsidized American-flag shipping operators reported combined revenues of $1.7 billion and net losses from shipping operations of $18 million. Their combined condensed financial statements are presented in Appendix II.

Also in calendar year 1977, commercial cargoes carried in U.S. oceanborne foreign trade reached a record 775.3 million tons with a record value of $171.2 billion. The U.S.-flag share increased in both tonnage carried and dollar value, compared to calendar year 1976, but its percentages declined in both categories. Commercial cargoes carried in U.S. oceanborne foreign trade from 1968 through 1977 are shown in Table 12.

U.S.-flag service between the Great Lakes and other major trading areas was expanded with the inauguration of service by Lykes Bros. Steamship Co. to the Caribbean, West Indies, and the West Coast of South America, in addition to Lykes' existing Great Lakes service to the Mediterranean, Black Sea, and east of Suez. To accommodate Great Lakes shippers, the firm opened a new office in Chicago.

Farrell Lines continued its American-flag, breakbulk service from the Great Lakes to west, south, and east African ports.

Operating Subsidy

The Maritime Administration pays operating-differential subsidy (ODS) to U.S. shipping companies to offset the higher cost of operating a vessel in foreign trade under the American flag rather than under a competitive foreign flag. In past years this form of aid generally covered the difference between American and foreign costs of wages, insurance, maintenance and repairs not compensated by insurance, and subsistence of officers and crews on passenger ships. However, to reduce the industry's dependence upon subsidy, policy instituted in recent years has encouraged the exclusion of subsidy for hull and machinery insurance premiums, maintenance and repairs not compensated by insurance, and protection and indemnity insurance. During FY 1978, MarAd awarded five contracts which excluded subsidy on some or all of these items, resulting in an estimated savings of $6 million annually.

All modern cargo vessels, including bulk carriers, that operate in an essential foreign trade are eligible for ODS. Total payments during fiscal year 1978 amounted to $303 million. (Operating-differential subsidy accruals and expenditures from January 1, 1937, through September 30, 1978, are summarized in Table 13, while accruals and outlays by shipping lines for the same period are shown in Table 14.)

Regular, long-term ODS agreements are written for 20 years and short-term (interim or Soviet grain) agreements for 1 year.

On September 30, 1978, 20 operators (9 liner and 11 bulk) held 23 regular (long-term) ODS agreements with the Agency (see Table 15), with 186 subsidized vessels in operation on that date.

Subsidy payments during FY 1978 pursuant to these regular ODS agreements totaled $295.7 million. ODS accruals from January 1, 1937, to September 30, 1978, totaled $5,437.9 million; recapture amounted to $238.2 million, leaving a net accrual of $5,199.7 million. Of the net accrual, $5,054.8 million has been paid out, leaving an estimated balance of $144.9 million at the end of the fiscal year.

Table 9: U.S. OCEANGOING MERCHANT MARINE—SEPTEMBER 30, 1978 [1]

	Privately Owned		Government-Owned		Total	
	Ships	Deadweight Tons (000)	Ships	Deadweight Tons (000)	Ships	Deadweight Tons (000)
Active Fleet:						
Combo Passenger/Cargo	4	37	5	38	9	75
Freighters	123	1,710	15	154	138	1,864
Bulk Carriers	15	484	0	0	15	484
Tankers	254	12,415	2	21	256	12,436
Intermodal	128	2,547	0	0	128	2,547
Tug/Barge	8	243	0	0	8	243
Total Active Fleet	**532**	**17,436**	**22**[2]	**212**	**554**	**17,649**
Inactive Fleet:						
Combo Passenger/Cargo	2	13	51	314	53	327
Freighters	18	237	168	1,809	186	2,046
Bulk Carriers	4	80	0	0	4	80
Tankers	16	677	12	164	28	840
Intermodal	14	290	2	22	16	312
Tug/Barge	0	0	0	0	0	0
Total Inactive Fleet	**54**	**1,296**	**233**[3]	**2,308**	**287**	**3,605**
Total Active and Inactive:						
Combo Passenger/Cargo	6	50	56	352	62	402
Freighters	141	1,947	183	1,962	324	3,910
Bulk Carriers	19	564	0	0	19	564
Tankers	270	13,092	14	185	284	13,276
Intermodal	142	2,837	2	22	144	2,859
Tug/Barge	8	243	0	0	8	243
Total American Flag	**586**	**18,733**	**255**	**2,521**	**841**	**21,253**

[1] Vessels of 1,000 gross tons and over, excluding privately owned tugs, barges, etc.
[2] Includes 10 vessels in bareboat charter and 10 vessels in custody of other agencies.
[3] National Defense Reserve Fleet consists of 224 ships, of which 15 are scrap candidates. Excluded are 62 vessels owned by the U.S. Navy which are in custody of MarAd's Reserve Fleet.
NOTE: Tonnage figures may not add due to rounding.

Corporate/Service Changes

There were two major rearrangements of corporate structure or service involving ODS contractors during the year.

Delta Steamship Lines, Inc., purchased or chartered from Prudential Lines, Inc., services to South America from the East and West Coasts of the United States, together with the ships serving those trades. American Export Lines, Inc., was merged into Farrell Lines, Inc., and its operations continued as a division of Farrell.

Additionally, as the result of financial and other difficulties, operations of Pacific Far East Line, Inc., were discontinued under its ODS agreement.

Contract Awards

Long-term ODS agreements were awarded during FY 1978 to American President Lines, Ltd., Delta Steamship Lines, Inc., and Prudential Lines, Inc., covering a total of 38 vessels. Each of these agreements has a termination date of December 31, 1997. Under the new contracts the subsidized operators will provide the following services:

- American President Lines, Ltd.—transpacific service between the U.S. Pacific Coast and the Far East, Southeast Asia, South Asia, and the Persian Gulf; and, on a privilege basis, between the U.S. Atlantic Coast via California to the same trading areas.
- Delta Steamship Lines, Inc.—service between U.S. Atlantic ports and ports of the Caribbean and the West Coast of South America, and

between U.S. Pacific ports and ports of South America, Central America, and the Caribbean. (These services were originally included in an ODS agreement awarded to Prudential Lines, Inc., effective January 1, 1978. As noted above, they were acquired by Delta in June 1978).

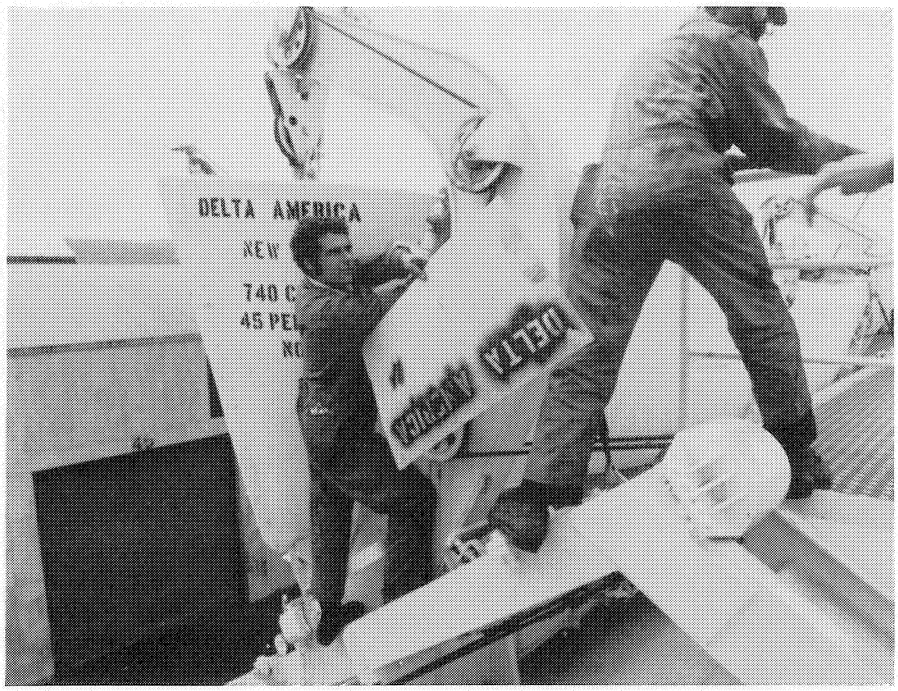
- Prudential Lines, Inc.—service between the U.S. North Atlantic and the Mediterranean. (Service between U.S. ports and ports of South America, Central America, and the Caribbean were originally included in Prudential's contract, but were subsequently acquired by Delta.)

In addition to these long-term agreements, interim 1-year ODS contracts were awarded to Lykes Bros. Steamship Co., Inc., for service on Trade Routes 13, 15B, 21, 22, 31, and Trade Area 4, and to States Steamship Co. for service on Trade Route 29. The 1-year agreements will permit the companies to maintain continuity of service until proceedings are completed on their long-term ODS applications (noted below). Both contracts were made effective from January 1, 1978, to December 31, 1978, and replaced long-term contracts which had expired December 31, 1977.

Pending Applications

Sixteen ODS applications from nonsubsidized operators were pending on September 30, 1978. By company and services, these included:

- Central Gulf Lines, Inc.—for LASH service between U.S. ports and ports in Southwest Asia, Indonesia, Malaysia, Singapore, Brunei, Africa on the Red Sea and Gulf of Aden, and the Gulf of Aqaba.
- Equity Carriers, Inc.—to carry dry-bulk cargoes in worldwide operations.



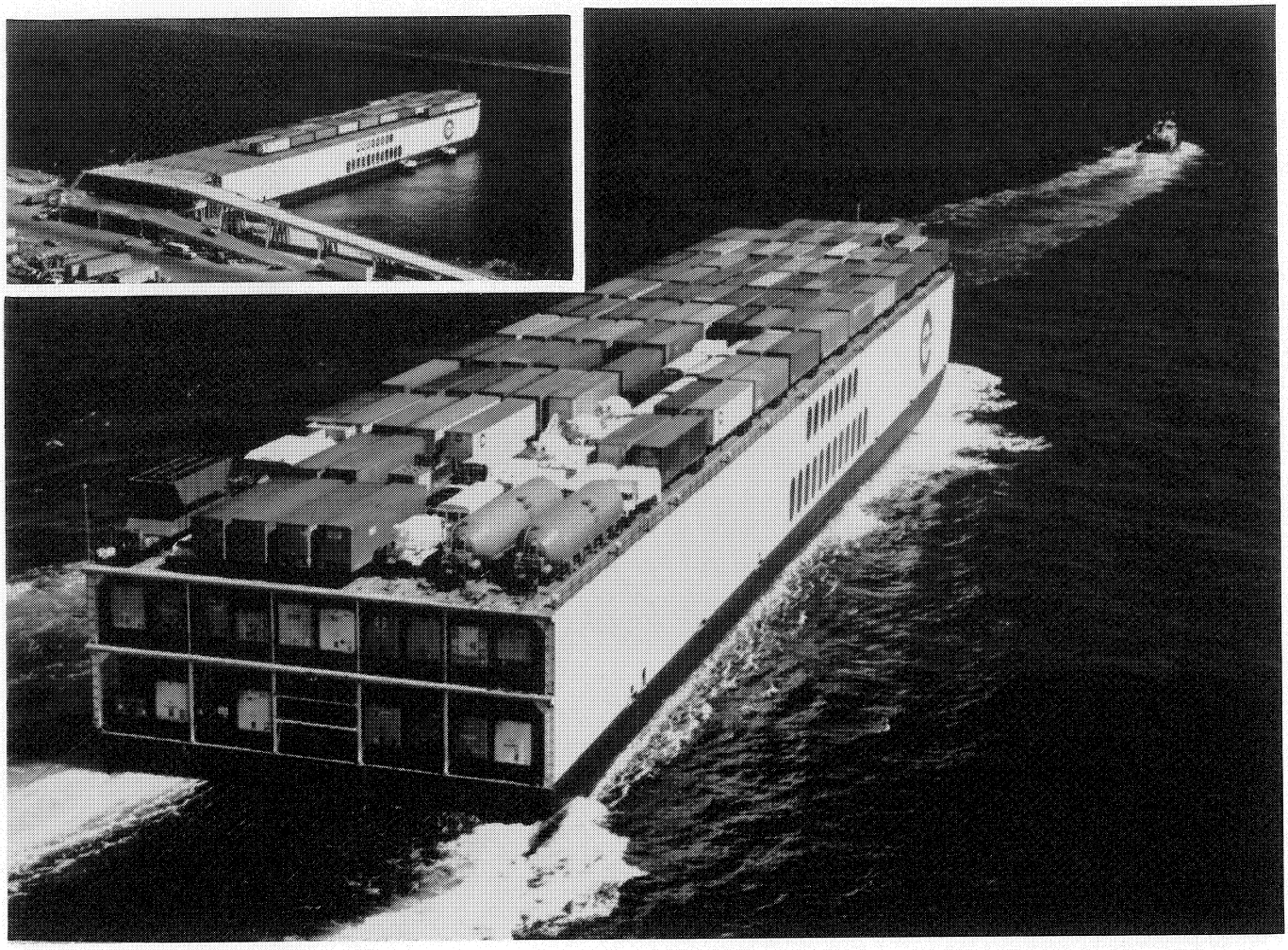
SS DELTA AMERICA, formerly PRUDENTIAL SEAJET, undergoes stem-to-stern change in identity in Portland, Ore. Crewman here removes stencil, revealing new name on one of ship's lifeboats. New name also was painted on bow, elsewhere; and stenciled on all life rings and fire axes aboard vessel, one of 13 acquired in 1978 by Delta Steamship Lines from Prudential Lines, Inc.

- Great Lakes-Atlantic Steamship Co.—for liner service between U.S. ports on the Great Lakes and St. Lawrence River, intermediate Canadian Great Lakes ports and other Canadian ports along the general track, and ports in the United Kingdom and Continental Europe.
- Suwannee River Finance, Inc.—to transport liquid- and dry-bulk cargoes in the foreign commerce of the United States and between foreign ports.
- Suwannee River Phosphate Finance, Inc.—to transport liquid- and dry-bulk cargoes in the foreign commerce of the United States and between foreign ports.
- Suwannee River Spa Finance, Inc.—to transport liquid- and dry-bulk cargoes in the foreign commerce of the United States and between foreign ports.

ODS applications also were pending for world-wide operations with ore/bulk/oil carriers or tankers, including vessels operated by Apollo Marine Co. and Artemis Marine Co.

In addition to these applications from nonsubsidized operators, six companies with existing ODS contracts applied for either renewals of existing contracts for operating subsidy to provide for additional sailings, or new contracts for other services as follows:

- American President Lines, Ltd.—for amendment of its ODS agreement so as to increase the maximum number of sailings permitted on its subsidized Line A, California transpacific service, and to delete certain restrictions on the Line A service.
- Farrell Lines, Inc. (American Export Lines Service)—for services from U.S. Atlantic and Gulf ports to ports in Western Europe, the Mediterranean, India, the Persian Gulf, and Red Sea.



EL CONQUISTADOR, second of four record-setting Roll-On/Roll-Off (RO/RO) barges delivered by FMC Corporation's Marine and Rail Equipment Div., Portland, Ore., to Crowley Marine Corp., San Francisco, carries three full decks of vans/trailers en route to Puerto Rico. World's largest RO/RO barges—580 feet long, 105 feet abeam, and 57 feet high overall—are operated by Crowley subsidiary, Trailer Marine Transport (TMT), between TMT's home ports, Jacksonville and Miami, Fla., and San Juan. Insert top left shows TMT's triple-deck concrete ramps, which permit all decks of barge to be worked simultaneously; allows offloading of 374 trailers and onloading of same number in as little as 8 hours.

- Lykes Bros. Steamship Co., Inc.—for a long-term renewal of its ODS agreement for service from U.S. Gulf ports to ports in the United Kingdom and Continent, the Mediterranean, the Far East, South and East Africa, and to the West Coast of South America; from South Atlantic ports to the Mediterranean; and from U.S. Great Lakes ports to ports in the Mediterranean, India, the Persian Gulf, and Red Sea. Lykes also has applied for a new long-range contract for services between U.S. Atlantic and Gulf ports and ports in India, the Persian Gulf, the Red Sea, and the Mediterranean.
- Prudential Lines, Inc.—for a new long-range contract for services between U.S. Atlantic and Gulf ports and ports in India, the Persian Gulf, and Red Sea.
- States Steamship Co.—for a long-term renewal for transpacific Far East service.
- Waterman Steamship Corp.—for service from U.S. Gulf ports to the United Kingdom and Continent, with unsubsidized privilege service from U.S. North Atlantic ports to the United Kingdom and Continent; from U.S. North Atlantic ports to Scandinavia and the Baltic; and from U.S. South Atlantic ports to the United Kingdom and Europe north of Portugal. (Waterman also has applied for an increase in sailings from 40 to 70 annually on its Trade Route 18 service from U.S. Atlantic and Gulf ports to ports in India, the Persian Gulf, and Red Sea. In addition, Waterman has requested the following privilege, Trade Route 18 service: Great Lakes/Africa, Red Sea, Persian Gulf and India; South and East Africa;

and Mediterranean Egypt. Waterman has applied for the addition of two (perhaps three) vessels to provide its existing Trade Route 18 service as well as the additional privilege service requested.)

Subsidy Index

The Subsidy Index System embodied in the Merchant Marine Act of 1970 provides for the payment of seafaring wage subsidies in per diem amounts. The rate of change in the index, computed annually by the Bureau of Labor Statistics, is used as the measure of change in seafaring employment costs.

In the 5 years prior to 1970, U.S. seamen's wages increased at a yearly rate of approximately 17 percent while nonfarm industry wages increased by about 6 percent a year. In the 5 years after 1970, U.S. seamen's wages and U.S. industry wages escalated at a comparable rate of about 11 percent.

The Maritime Subsidy Board establishes tentative subsidy rates within 90 days of the beginning of each fiscal year for which such rates are effective. The tentative FY 1978 rates for all subsidized vessels were completed in August 1977. Tentative rates for FY 1979 were completed in September 1978.

MarAd completed all final 1975 subsidy rates applicable to liner and passenger vessels in liner service.

In the Soviet Grain Program, 175 of 335 final rates have been completed since the inception of the program in FY 1973.

Soviet Grain ODS

Participation of U.S.-flag vessels in the carriage of grain exports to the Soviet Union was facilitated by a 3-year maritime agreement signed by the two countries in October 1972.

In December 1975 an accord was reached on a 6-year U.S.-U.S.S.R. Maritime Agreement, which continues to provide the fleets of each with equal access to at least one-third of all waterborne cargoes moving between the two nations. (The Agreement is described in Chapter 10.)

Since the first agreement was signed, U.S.-flag ships have participated in the carriage of more than 57.4 million metric tons of grain purchased by the Soviet Union. During this period the Soviet Union chartered American-flag ships for the carriage of 12 million tons of grain on 342 voyages to the U.S.S.R.

At the close of the fiscal year 33 operators held short-term ODS agreements covering 58 vessels for the carriage of agricultural commodities from U.S. ports to ports in the U.S.S.R. (see Table 16). Payments during FY 1978 under the special Soviet grain subsidy agreements totaled $7.5 million (see Table 13).

Since this program was begun in fiscal year 1973, operators have accrued $135.4 million in ODS. Of this accrual, $127.3 million has been paid, leaving an estimated unpaid balance of $8.1 million.

In addition to carrying grain cargoes, these vessels have the ability to import substantial amounts of crude oil and petroleum products on return voyages.

The exported grain is carried under a 5-year grain agreement which became effective October 1, 1976. The grain agreement calls for the Soviet Union to purchase at least 6 million metric tons of grain per year from U.S. suppliers with the option, within certain guidelines, of increasing these purchases to 8 million metric tons per year.

Grain Freight Rates

A new U.S.-U.S.S.R. freight rate agreement, which goes into effect January 1, 1979, provides for a rate of $18.25 per long ton to be paid by Soviet charterers to operators of U.S.-flag vessels transporting grain to the Soviet Union through December 31, 1979.

Soviet ODS Awards

During FY 1978 four new operators with six ships were awarded short-term ODS contracts under the Soviet Grain Program. In addition, two operators with existing contracts added two vessels to their contracts. Twelve existing operators with 27 ships terminated their ODS contracts and two existing operators withdrew two vessels from the program. A net reduction of eight operators and 21 vessels was recorded during the fiscal year.

Passenger Service

The passenger liner SS UNITED STATES, acquired by the Maritime Administration under Public Law 92-296 on February 5, 1973, was sold to United States Cruises, Inc., of Seattle, Wash., on September 29, 1978, for $5 million. The company paid $500,000 down and was committed to pay the balance within 8 months. The 26-year-old ship is to be refurbished for warm weather cruises between U.S. West Coast ports and Hawaii, carrying up to 1,000 passengers.

The SS MARIPOSA and SS MONTEREY, operated with ODS by Pacific Far East Line, Inc., in the Pacific trade, reached the end of their 25-year statutory economic lives and were withdrawn from the U.S.-flag passenger fleet during the fiscal year.

On September 30, 1978, the active U.S.-flag seagoing passenger fleet consisted of four combination passenger/cargo vessels, the SSs SANTA MAGDALENA, SANTA MARIA, SANTA MARIANA, and SANTA MERCEDES.

Limited ocean passenger service (approximately 12 passengers per vessel) was continued by seven U.S.-flag operators: Farrell Lines, Inc.; Moore-McCormack, Lines, Inc.; Lykes Bros. Steamship Co., Inc.; American President Lines, Ltd.; Waterman Steamship Corp.; Delta Steamship Lines, Inc.; and United States Lines, Inc.

In the domestic passenger trades, cruise service involving, at various times, New England, New York State, the St. Lawrence Valley, the Atlantic Intra-coastal Waterway, Chesapeake Bay, Florida, and the Bahamas is offered by two operators, using specially-designed, small, shallow-draft vessels.

On the inland waterways, two traditionally styled steamboats provide a variety of cruises on major midwestern rivers.

In the Pacific Northwest, an extensive ferry system is operated by the State of Alaska. This system furnishes passenger, vehicle, and some freight service linking the State's ports with one another and with the lower 48 States at Seattle.

Section 804 Activities

Section 804 of the Merchant Marine Act, 1936, as amended, makes it unlawful, without the prior approval of the Secretary of Commerce, for any contractor receiving ODS or any holding company, subsidiary, affiliate or associate of such contractor, directly or indirectly to own, charter, act as agent or broker for, or operate any foreign-flag vessel which competes with an essential American-flag service. The prohibition also applies to any officers, directors, agents, or executives of such an organization.

During FY 1978 the following waivers were granted under Section 804:

- American President Lines, Ltd.—reaffirming, consistent with service specified under APL's new 20-year ODS contract, its permission (a) to issue passenger tickets and/or exchange orders for the transportation of passengers on foreign-flag vessels, whether or not the operators of such vessels are members of the Transpacific Passenger Conference, with the understanding that some part of the passenger passage involved will be on a vessel operated by a member of the Transpacific Passenger Conference and (b) to conduct direct-mail campaigns for the purpose of soliciting passenger traffic only, for steamship lines operating foreign-flag vessels, and to book passengers for such foreign-flag vessels resulting from direct-mail campaigns.
- Delta Steamship Lines, Inc.—reaffirming Delta's permission to act as husbanding agent in U.S. Gulf ports to all Empresa Lineas Maritimas Argentinas, North American West African Lines, and Booth Line vessels.
- Lykes Bros. Steamship Co., Inc.—reaffirming Lykes' permission (a) to provide agency services to certain foreign-flag vessels in U.S. Gulf ports and Tampa, Fla.; (b) to provide—in partnership with Biehl & Co. and Roberts Steamship Agency—stevedoring, agency, and husbanding services for foreign-flag vessels at Baton Rouge, La.; (c) to act as husbanding agent for tankers of O.N.E. Shipping, Ltd.; and (d) to act as general agent for vessels of the Compagnie Nationale Algerienne de Navigation. Termination date of these waivers is December 31, 1978.
- States Steamship Co.—reaffirming States' permission to continue affiliation with Portland Stevedoring Co., two of whose subsidiaries perform customs broker and husbanding agency services for foreign-flag vessels at Coos Bay, Ore., and Eureka, Calif. This waiver terminates December 31, 1978.

The following Section 804 waivers were granted in connection with the transport of grain to the Soviet Union:

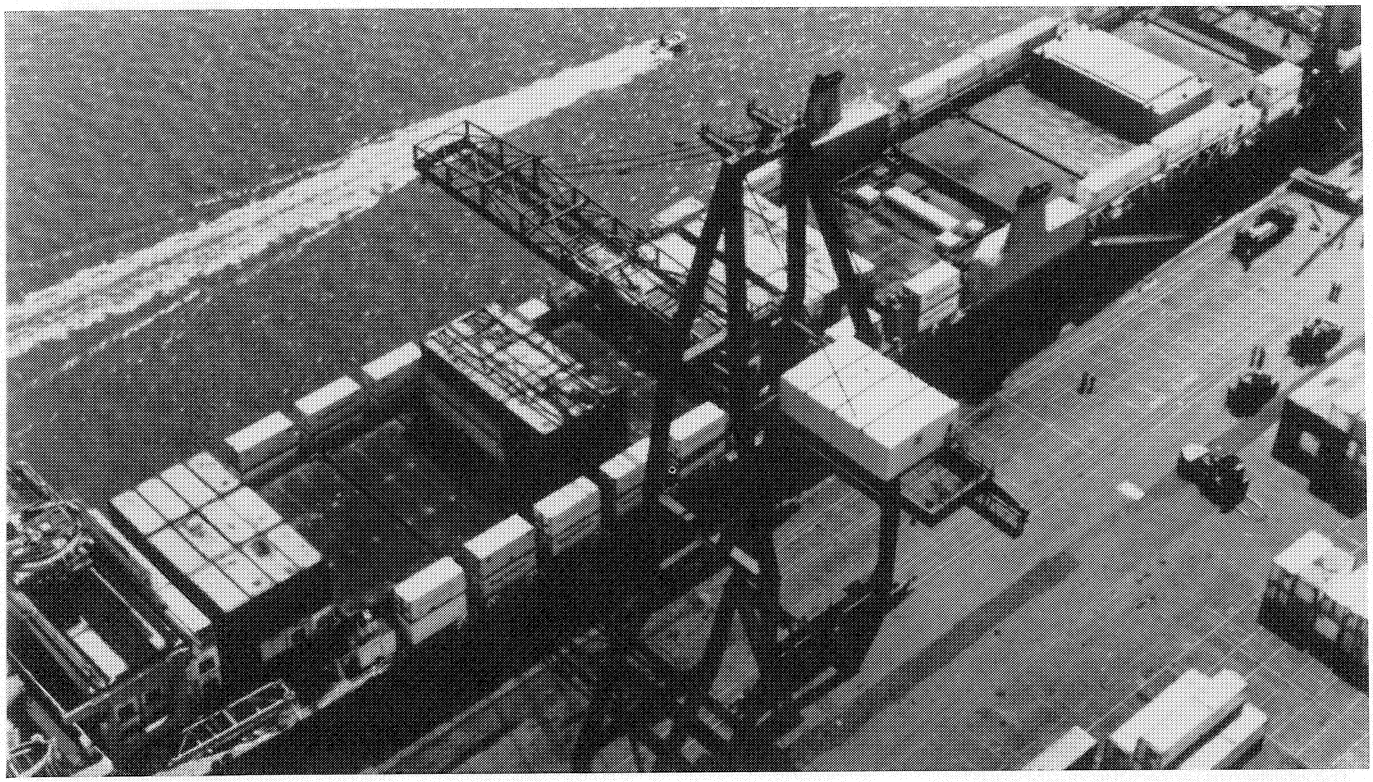
- Juniper Tankers, Inc.—to permit affiliates of Juniper to continue to own, charter, and operate foreign-flag vessels.
- Sun Transport, Inc.—to permit Sun to continue to operate the foreign-flag ships S/Ts SOUTHERN SUN, ATLANTIC SUN, and PACIFIC SUN.
- Cove Tankers Corp., Cove Trading, Inc.. and Cove Ventures, Inc.—to permit Seatrain Lines, Inc., Seatrain's affiliates, and/or associates to continue to own, charter, and/or operate foreign-flag vessels.

In addition, previously granted waivers for 31 companies were updated and renewed to allow them continued ODS operation in the Soviet Grain Program.

Charter/Dry-Bulk Shipping Initiatives

During FY 1978 several Maritime Administration initiatives were specifically directed toward the goal of capturing a significant share of the charter shipping market commonly known by its largest cargo component, dry-bulk. This category of shipping (which excludes energy resources) encompasses approximately 85 million tons of general cargo annually shipped in chartered vessels.

While the total U.S. foreign trade charter market continued to grow, in calendar year 1977 the U.S.-flag tonnage share remained a meager 3.3 percent in the tanker trade and 2 percent of all other nonliner foreign cargoes (mostly dry-bulk). At the close of FY 1978 the active, ocean-



Farrell Lines LASH vessel works containerized cargo at Port of San Francisco's Pier 94/96, largest terminal for lighter-aboard ship vessels on West Coast. Facility includes 10 acres of lighter storage space.

going, U.S.-flag dry-bulk fleet numbered only 15 vessels with a median age of 25 years.

MarAd has had under active consideration the proposals to increase incentives for U.S.-flag charter/bulk shipping that were the outgrowth of the July 1976 Hyannis, Mass., conference at which the Agency brought together senior representatives of Government and industry.

Participants in the bulk shipping conference recommended loosening restrictions on foreign-to-foreign trading by subsidized operators; allowing U.S.-flag operators to receive subsidy without divesting their foreign-flag operations; permitting earnings from foreign-flag operations to be deposited in Capital Construction Funds for eventual construction of U.S.-flag vessels; and easing the 20-year vessel replacement and statutory prohibition against the foreign sale of U.S.-flag bulk vessels.

Accordingly, MarAd is considering proposed regulatory changes, among others, to remove some of these constraints.

In other FY 1978 activities, the Agency let three study and design contracts to improve the U.S.-flag position in the charter shipping market.

A team of naval architects, economists, and shipbuilders was commissioned to develop a standardized design for vessels best suited to the charter market as it will develop through the end of the century. Industry executives serve as a steering committee in this project.

A second study seeks ways to improve productivity at bulk cargo facilities in the Great Lakes area, particularly for iron ore and coal.

The other study, jointly sponsored by MarAd and the Niagara Frontier Transportation Authority, will examine the feasibility and market potential of transshipping western U.S. coal through the Great Lakes to the port of Buffalo, N.Y.

(Recent developments in the U.S. domestic charter trade are covered in Chapter 3.)

International Bulk Trades

Generally depressed freight rates characterized the world liquid-bulk trades during this reporting period. However, rate levels in this sector improved and charter market activity increased toward the end of the year. Worldwide, the number of tankers in lay-up during FY 1978 declined from 353 to 320 although total laid-up tonnage increased, as smaller vessels returned to service while some larger ones were added to the idle list.

The world dry-bulk trades, while experiencing somewhat slack demand during the year, fared better overall than the liquid-bulk trades. Dry-bulk freight rates generally increased, reflecting, among other things, an upturn in steel production which, in turn, required the transportation of more iron ores and coking coal by water than in the previous year. Grain shipments also rose. The volume of dry-bulk carriers in lay-up was fairly stable and relatively small, ranging from 2 million to 5 million dwt.

Liner Conference Study

A major study dealing with the effect of the conference system on U.S. liner shipping was completed for MarAd in this fiscal year. Entitled *The U.S. Merchant Marine and the International Conference System*, the study projected the economic consequences of alternative national maritime policies under varying circumstances of competition and trade conditions on various trade routes.

EEO In Ship Operations

The employment of minorities by major shipping companies made steady gains from 1969 through 1978. During that period the Maritime Administration was responsible for monitoring the American lines' compliance with Federal equal employment opportunity (EEO) laws. In fiscal year 1979, this function is being consolidated with other Federal EEO activities in the U.S. Department of Labor.

MarAd measured EEO progress in this segment of the maritime industry by monitoring those major ship operators accounting for 80 percent of the total U.S. shoreside noncasual employment.

From 1969 to 1978 minority employment grew from 730 to 1,660 persons, or from 10.4 percent to 18.8 percent of the shoreside workforce. While overall employment was increasing 25.4 percent, minority employment rose 127.4 percent. The number of female employees reached 3,404 in 1978, a 50.8 percent increase over 1969. In 1978 women comprised 38.6 percent of this workforce.

Ship operations employees ashore essentially are white-collar workers. In 1969, 597 or 81.8 percent of the minorities in the workforce were employed in the office and clerical category, while only 106, or 14.5 percent, were employed in the top three categories combined—technicians, professionals, and officials and managers. Today, 26.1 perecnt of the minority employees—a total of 433—are within those three categories.

The status of women in white-collar salaried employment in ship operations also showed continued improvement. In 1978 women occupied 483 positions in the top three categories, compared with 48 in 1969, and now account for 12.5 percent of the total employment in these categories.

Foreign Transfers

During the fiscal year the Maritime Administration approved the transfer of 45 ships of 1,000 gross tons and over to foreign firms (see Table 17). Twenty of the ships were undocumented or registered under foreign flags although owned by U.S. citizens. Seventeen were sold for scrapping abroad.

Permission also was granted for the foreign transfer of 350 vessels of less than 1,000 gross tons during the fiscal year. These included 179 commercial and 171 pleasure craft.

In addition, MarAd approved 66 U.S.-owned ships of over 1,000 gross tons and 106 under 1,000 gross tons for charter to aliens.

During the fiscal year there were 64 sale violations involving privately owned ships, of which 53 were mitigated or settled.

Until the enactment of the National Emergencies Act (50 U.S.C. 1601), the national emergency declared by President Truman on December 16, 1950, required administration of the approval program under Section 37 of the Shipping Act, 1916, as amended. Section 37, while permanent legislation, is only operative during periods of war or national emergency declared by Proclamation of the President. Therefore, as of September 14, 1978, it is no longer necessary for U.S. citizens and domestic corporations to obtain MarAd approval under Section 37 for transfers to noncitizens of undocumented vessels, or any interest in undocumented vessels, or vessels whose last documentation was not under the laws of the United States.

Also, U.S. citizens and domestic corporations owning shipyards, drydocks, and ship repair facilities now may transfer such assets without MarAd's approval.

Finally, contracts to construct vessels within the United States for foreign account no longer require MarAd approval. In this connection MarAd, through regulations, granted blanket approval in 1975 for contracts to construct vessels within the United States for foreign account.

Each approval entered into between MarAd and a foreign purchaser incorporates the standard foreign transfer conditions set forth in the Foreign Transfer Policy Statement of 1964, as amended (46 C.F.R. Sec. 221.7 Appendix). These terms and conditions run with the title to the ship and remain in effect for the period of the remaining economic life of the ship or for the duration of the national emergency proclaimed by the President on December 16, 1950, whichever period is longer. During the period that this national emergency was in effect, approvals for the transfer of 279 vessels were granted pursuant to Section 37.

Table 10: EMPLOYMENT OF U.S.-FLAG OCEANGOING FLEET—SEPTEMBER 30, 1978 [1]

Status and Area of Employment	Total		Vessel Type: Combination Pass./Cargo		Vessel Type: Freighters		Vessel Type: Tankers	
	No.	Dwt. (000)	No.	Dwt. (000)	No.	Dwt. (000)	No.	Dwt. (000)
Grand Total	**841**	**21,253**	**62**	**402**	**490**	**7,405**	**289**	**13,446**
Active Vessels:	**554**	**17,649**	**9**	**75**	**284**	**4,969**	**261**	**12,605**
Foreign Trade	247	7,960	4	37	185	3,522	58	4,401
Nearby Foreign[2]	43	2,791	0	0	1	25	42	2,766
Great Lakes-Seaway Foreign	4	65	0	0	4	65	0	0
Overseas Foreign	200	5,104	4	37	180	3,432	16	1,635
Foreign to Foreign	19	524	0	0	15	270	4	254
Domestic Trade	221	7,721	0	0	46	685	175	7,036
Coastwise	124	3,539	0	0	6	111	118	3,428
Intercoastal	16	517	0	0	0	0	16	517
Noncontiguous	81	3,665	0	0	40	574	41	3,091
Other U.S. Agency Operations	67	1,444	5	38	38	492	24	914
MSC Charter	45	1,232	0	0	23	339	22	893
Bareboat Charter & Other Custody	22	212	5	38	15	153	2	21
Inactive Vessels:	**287**	**3,604**	**53**	**327**	**206**	**2,436**	**28**	**841**
Temporarily Inactive	21	462	0	0	15	259	6	203
Laid-Up (Privately Owned)	30	745	2	13	18	258	10	474
National Defense Reserve Fleet [4]	227	2,283	50	304	165	1,815	12	164
Laid-Up (MarAd-Owned)[3] Pending Disposition	9	114	1	10	8	104	0	0

[1] Excludes vessels operating exclusively on the inland waterways and Great Lakes, those owned by the U.S. Army and Navy, and special types such as tugs, cable ships, etc.
[2] Nearby foreign trade includes Canada, Mexico, Central America, West Indies, and North Coast of South America.
[3] Other than vessels in the National Defense Reserve Fleet.
[4] Includes 3 Vessels of Pacific Far East Line, Inc., berthed by NDRF.

With the termination of the emergency declared in 1950, 166 vessels are in the process of being released from contractual controls because the economic life of the vessels has ended. However, 113 vessels are retained under the economic life requirement pursuant to the foreign transfer conditions.

The termination of the national emergency does not affect any action or proceeding based on any act occurring on or prior to September 13, 1978. Accordingly, any violation of Section 37 occurring on or prior to September 13, 1978, will require action by MarAd.

It should be noted that ship transfer provisions of Section 9 and 41 of the Shipping Act, 1916, as amended, still remain in full force and effect.

User charges for filing applications for foreign transfers and similar actions totaled $44,365 in this reporting period. The total included $6,000 in fees filed pursuant to MarAd contracts.

In addition, three new banks were approved to serve as trustees, pursuant to P.L. 89-346, along with the 53 previously approved.

Table 11: MAJOR MERCHANT FLEETS OF THE WORLD—DECEMBER 31, 1977

Country	No. of [1] Ships	Rank by [2] No. Ships	Dwt. (thousands)	Rank by Dwt.
Liberia	2,627	1	157,788,300	1
Japan	1,846	5	62,455,300	2
Norway	978	7	52,568,600	3
United Kingdom	1,377	6	51,105,500	4
Greece	2,379	3	49,825,000	5
Panama	2,041	4	31,250,500	6
France	415	—	20,815,100	7
U.S.S.R.	2,456	2	20,480,500	8
Italy	603	8	17,858,100	9
United States (Privately Owned)	571	11	17,321,400	10
Germany (West)	592	9	14,664,400	11
Spain	479	13	12,195,200	12
Sweden	286	—	11,965,000	13
Singapore	574	10	11,889,800	14
India	363	—	8,890,600	15
All Others[3]	6,509	—	100,235,200	—
Total	**24,096**	—	**641,308,500**	—

[1] Oceangoing merchant ships of 1,000 gross tons and over.
[2] By number of ships, Cyprus ranks 12th with 502 vessels aggregating 3,633,300 dwt., the People's Republic of China ranks 14th with 462 vessels aggregating 6,476,600 dwt., and the Netherlands ranks 15th with 443 vessels aggregating 7,686,500 dwt.
[3] Includes 269 United States Government-owned vessels of 2,650,300 dwt.

Table 12: U.S. OCEANBORNE FOREIGN TRADE/COMMERCIAL CARGO CARRIED

Tonnage (Millions)

Calendar Year	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Total-Tons	418.6	427.5	473.2	457.4	513.6	631.6	628.9	615.6	698.8	775.3
U.S.-Flag Tons	25.0	19.8	25.2	24.4	23.8	39.9	40.9	31.4	33.8	34.8
U.S. Percent of Total	6.0	4.6	5.3	5.3	4.6	6.3	6.5	5.1	4.8	4.5
Liner Total Tons	46.1	41.9	50.4	44.2	44.6	51.3	51.4	44.3	49.8	47.8
Liner U.S.-Flag Tons	11.1	9.7	11.8	10.1	9.8	13.2	15.3	13.6	15.4	14.4
Liner U.S. Percent	24.0	23.1	23.5	22.9	21.9	25.8	29.8	30.7	30.9	30.2
Non-Liner Total Tons	209.5	212.1	240.7	220.7	242.6	281.9	282.7	275.3	289.6	289.0
Non-Liner U.S.-Flag Tons	6.4	4.6	5.4	4.8	3.8	4.5	5.0	3.8	4.9	5.7
Non-Liner U.S. Percent	3.0	2.2	2.2	2.1	1.6	1.6	1.8	1.4	1.7	2.0
Tanker Total Tons	163.1	173.5	182.1	192.5	226.4	298.4	294.8	296.0	359.4	438.6
Tanker U.S.-Flag Tons	7.5	5.5	8.0	9.5	10.2	22.2	20.5	14.0	13.6	14.6
Tanker U.S. Percent	4.6	3.2	4.4	4.9	4.5	7.4	7.0	4.7	3.8	3.3

Dollar Value ($ Billions)

Total Value	41.1	41.9	49.7	50.4	60.5	84.0	124.2	127.5	148.4	171.2
U.S.-Flag Value	8.5	8.1	10.3	9.9	11.1	15.9	22.0	22.4	26.4	28.0
U.S. Percent of Total	20.7	19.3	20.7	19.6	18.4	18.9	17.7	17.5	17.8	16.4
Liner Total Value	26.8	27.2	33.5	32.4	37.4	49.6	63.4	64.0	75.8	82.3
Liner U.S.-Flag Value	7.8	7.5	9.7	9.2	10.3	14.4	19.4	20.0	23.9	25.2
Liner U.S. Percent	29.0	27.6	28.8	28.4	27.7	29.1	30.6	31.2	31.6	30.7
Non-Liner Total Value	10.8	11.1	12.2	13.2	17.4	25.2	34.7	36.6	38.2	42.7
Non-Liner U.S.-Flag Value	.5	.4	.4	.4	.4	.7	.8	1.0	1.1	1.2
Non-Liner U.S. Percent	4.6	3.6	3.3	3.1	2.4	2.5	2.3	2.8	2.8	2.8
Tanker Total Value	3.4	3.6	4.0	4.9	5.7	9.2	26.0	26.9	34.4	46.2
Tanker U.S.-Flag Value	.2	.2	.2	.3	.4	.8	1.8	1.4	1.4	1.6
Tanker U.S. Percent	6.6	5.6	5.6	5.5	6.2	9.1	6.9	5.1	4.2	3.5

NOTE: Includes Government-sponsored cargo; excludes Department of Defense cargo and U.S./Canada translakes cargo.

Table 13: ODS ACCRUALS AND OUTLAYS—JANUARY 1, 1937, to SEPTEMBER 30, 1978

Calendar Year of Operation	Accruals			Outlays		
	Subsidies	Recapture	Net Subsidy Accrual	In FY 1978	Total Amount of Net Accrual Paid	Net Accrual Liability
1937-1955	$ 682,457,954	$157,632,946	$ 524,825,008	$ –0–	$ 524,825,008	$ –0–
1956-1960	751,430,098	63,755,409	687,674,689	–0–	687,674,689	–0–
1961	170,884,261	2,042,748	168,841,513	–0–	168,841,513	–0–
1962	179,727,400	4,929,404	174,797,996	–0–	174,467,393	330,603
1963	189,119,876	(1,415,917)	190,535,793	–0–	190,535,793	–0–
1964	220,334,818	674,506	219,660,312	–0–	219,660,312	–0–
1965	183,913,236	1,014,005	182,899,231	–0–	182,899,231	–0–
1966	202,734,069	3,229,471	199,504,598	–0–	199,504,598	–0–
1967	220,579,702	5,162,831	215,416,871	–0–	215,416,871	–0–
1968	222,862,970	3,673,790	219,189,180	99,961	219,189,180	–0–
1969	233,201,233	2,217,144	230,984,089	–0–	228,038,947	2,945,142
1970	232,686,761	(1,908,643)	234,595,404	–0–	234,449,812	145,592
1971	200,798,160	(2,821,259)	203,619,419	–0–	203,286,360	333,059
1972	192,512,930	–0–	192,512,930	2,641,749	190,732,158	1,780,772
1973	221,802,685	–0–	221,802,685	2,301,860	219,625,626	2,177,059
1974	227,811,712	–0–	227,811,712	9,267,296	216,697,793	11,113,919
1975	261,333,646	–0–	261,333,646	7,093,245	253,532,418	7,801,228
1976	284,532,629	–0–	284,532,629	3,506,618	260,804,744	23,727,885
1977	311,197,202	–0–	311,197,202	89,298,993	283,149,816	28,047,386
1978	247,958,231	–0–	247,958,231	181,497,806	181,497,806	66,460,425
Total Regular ODS	$5,437,879,573	$238,186,435	$5,199,693,138	$295,707,528	$5,054,830,068	$144,863,070
Soviet Grain Programs	$ 135,446,393	$ –0–	$ 135,446,393	$ 7,486,047	$ 127,301,855	$ 8,144,538
Total ODS	**$5,573,325,966**	**$238,186,435**	**$5,335,139,531**	**$303,193,575**	**$5,182,131,923**	**$153,007,608**

Table 14: OPERATING-DIFFERENTIAL SUBSIDY ACCRUALS AND OUTLAYS BY LINES—JANUARY 1, 1937, TO SEPTEMBER 30, 1978

Lines	Accruals			ODS Paid	Net Accrued Liability
	ODS	Recapture	Net Accrual		
Aeron Marine Shipping	$ 9,274,904	$ –0–	$ 9,274,904	$ 6,635,441	$ 2,639,463
American Banner Lines[1]	2,626,512	–0–	2,626,512	2,626,512	–0–
American Diamond Lines[1]	185,802	28,492	157,310	157,310	–0–
American Export Lines[2]	703,158,566	10,700,587	692,457,979	657,462,745	34,995,234
American Mail Line[3]	158,602,781	7,424,901	151,177,880	148,838,241	2,339,639
American President Lines[3]	691,469,364	17,676,493	673,792,871	659,792,279	14,000,592
American Shipping	3,113,725	–0–	3,113,725	2,287,837	825,888
American Steamship	111,751	–0–	111,751	76,462	35,289
Aquarius Marine Co.	3,221,776	–0–	3,221,776	2,345,586	876,190
Aries Marine Shipping	9,652,611	–0–	9,652,611	7,904,569	1,748,042
Atlantic & Caribbean S/N[1]	63,209	45,496	17,713	17,713	–0–
Atlas Marine Co.	2,271,418	–0–	2,271,418	1,610,061	661,357
Baltimore Steamship[1]	416,269	–0–	416,269	416,269	–0–
Bloomfield Steamship[1]	15,588,085	2,613,688	12,974,397	12,974,397	–0–
Chestnut Shipping Co.	4,680,367	–0–	4,680,367	3,672,510	1,007,857
Delta Steamship Lines	224,257,441	8,185,313	216,072,128	205,238,534	10,833,594
Ecological Shipping Co.	4,194,586	–0–	4,194,586	2,843,232	1,351,354
Farrell Lines	322,655,865	1,855,375	320,800,490	315,373,346	5,427,144
Prudential Lines[4]	557,695,280	24,223,564	533,471,716	519,910,153	13,561,563
Gulf & South American Steamship[5]	34,471,780	5,226,214	29,245,566	29,245,566	–0–
Lykes Bros. Steamship	728,174,028	52,050,599	676,123,429	656,209,179	19,914,250
Margate Shipping	16,058,600	–0–	16,058,600	13,722,179	2,336,421
Moore-McCormack Bulk Transport	9,210,841	–0–	9,210,841	7,442,273	1,768,568
Moore-McCormack Lines	529,270,400	17,762,445	511,507,955	502,967,150	8,540,805
N.Y. & Cuba Mail Steamship[1]	8,090,108	1,207,331	6,882,777	6,882,777	–0–
Oceanic Steamship[6]	112,146,235	1,171,756	110,974,479	110,800,925	173,554
Pacific Argentina Brazil Line[1]	7,963,939	270,701	7,693,238	7,693,238	–0–
Pacific Far East Line[7]	288,997,480	23,479,204	265,518,276	260,214,760	5,303,516
Pacific Shipping Inc.	2,640,455	–0–	2,640,455	1,979,762	660,693
Prudential Steamship[1]	26,098,640	1,680,796	24,417,844	24,417,844	–0–
Sea Shipping[1]	25,819,800	2,429,102	23,390,698	23,390,698	–0–
South Atlantic Steamship[1]	96,374	84,692	11,682	11,682	–0–
States Steamship	227,388,446	5,110,997	222,277,449	217,777,376	4,500,073
U.S. Lines[8]	584,187,406	54,958,689	529,228,717	529,228,717	–0–
Waterman Steamship	111,837,423	–0–	111,837,423	103,466,972	8,370,451
Worth Oil Transport	3,289,982	–0–	3,289,982	2,667,702	622,280
Zapata Products	8,897,324	–0–	8,897,324	6,528,071	2,369,253
Total Regular ODS	$5,437,879,573	$238,186,435	$5,199,693,138	$5,054,830,068	$144,863,070
Soviet Grain Programs[9]	$ 135,446,393	$ –0–	$ 135,446,393	$ 127,301,855	$ 8,144,538
TOTAL ODS	**$5,573,325,966**	**$238,186,435**	**$5,335,139,531**	**$5,182,131,923**	**$153,007,608**

[1] No longer subsidized or combined with other subsidized lines.
[2] AEL was acquired by Farrell Lines March 29, 1978.
[3] APL merged its operations with AML's October 10, 1973.
[4] Changed from Prudential-Grace Lines, Inc., August 1, 1974.
[5] Purchased by Lykes Bros. Steamship Co.
[6] Purchased by Pacific Far East Line, Inc.
[7] Went into receivership August 2, 1978.
[8] Ceased to be a subsidized line in November 1970.
[9] Includes 37 subsidized operators.

Table 15: ODS CONTRACTS IN FORCE—SEPTEMBER 30, 1978

A. Liner Trades:

Operator and Contract No.	Contract Duration	Number of Subsidized Ships	Service (Trade Route/Area)	Annual Sailings Minimum	Annual Sailings Maximum
American President Lines, Ltd. MA/MSB–417	1–01–78 to 12–31–97	22	Transpacific Services[1]		
			California/Far East, Line A (TR 29)[2]	50	82
			California/Far East, Line A Extension (TRs 17, 28, 29)	18	28
			Washington–Oregon/Far East Line B (TR 29)	54	80
			Washington–Oregon/Far East Line B Extension (TRs 28, 29)	6	—
Delta Steamship Lines, Inc. MA/MSB–353	1–01–76 to 12–31–95	11	U.S. Gulf/East Coast South America (TR 20)	43	Overall maximum not to exceed 79
			U.S. Gulf/West Africa (TR 14–2)	24	
Delta Steamship Lines, Inc. MA/MSB–425	6–17–78 to 12–31–97	13	U.S. Atlantic/West Coast South America (TR 2)	48	62
			U.S. Atlantic/Caribbean (TR 4)	22	33
			U.S. Pacific/South America, Central America, Caribbean (TRs 23, 24, 25)	25	42
Farrell Lines Inc. MA/MSB–352	1–01–76 to 12–31–95	16	U.S. Atlantic/South & East Africa (TR 15–A)	20	(30)
			U.S. Atlantic/West Africa (TR 14–1)	20	Overall maximum not to exceed 89
			U.S. Atlantic & Gulf/Australia & New Zealand (TR 16)	16	
			U.S. West Coast/Australia & New Zealand (TR 27)	14	24
Farrell Lines Inc. (American Export Services) FMB–87	1–01–60 to 12–31–79	21	U.S. Atlantic/Mediterranean and Black Seas (TR 10)	65	95
			U.S. Atlantic/Far East (TR 12)	20	30
			U.S. Atlantic/India (TR 18)	18	25
			U.S. North Atlantic/Western Europe (TR 5–7–8–9)	40	55
Lykes Bros. Steamship Co., Inc. MA/MSB–420	1–01–78 to 12–31–78	41	U.S. Gulf/U.K.-Continent (TR 21)	24	42[3]
			U.S. Gulf/Mediterranean (TR 13)	42	48
			U.S. Gulf/Far East (TR 22)	48	60
			U.S. Gulf/South & East Africa (TR 15–B)	18	24
			U.S. Gulf/West Coast South America (TR 31)	30	36
			U.S. Great Lakes/Mediterranean, India, Persian Gulf, Red Sea (Trade Area 4)	3	10
			U.S. Great Lakes/South America (Trade Area 3)	10	25
Moore-McCormack Lines, Inc. MA/MSB–338	1–01–75 to 12–31–94	13	U.S. Atlantic/East Coast South America (TR 1)	50	86
			U.S. Atlantic/South & East Africa (TR 15–A)	15	25

Table 15: (Continued)

Operator and Contract No.	Contract Duration	Number of Subsidized Ships	Service (Trade Route/Area)	Annual Sailings Minimum	Annual Sailings Maximum
Pacific Far East Line, Inc. FMB-81[4]	1-01-75 to 12-31-78	6	U.S. Pacific/Australia-Combination (TR 27)	12	16
			Transpacific Freight Service (As Extended) (TR 29)	20	36
Prudential Lines, Inc. MA/MSB-421	1-01-78 to 12-31-97	3	U.S. North Atlantic/Mediterranean (TR 10)	24	36
States Steamship Corp. MA/MSB-419	1-01-78 to 12-31-78	7	Washington-Oregon/Far East (TR 29)	10	16
			Washington-Oregon-California/ Far East (TR 29)	20	41
			California/Far East (TR 29)	22	38
Waterman Steamship Corp. MA/MSB-115	6-04-71 to 6-03-91	7	U.S. Atlantic-Gulf/India, Pakistan, Persian Gulf, and Red Sea (TR 18)	30	40
Waterman Steamship Corp. MA/MSB-378	10-26-76 to 10-25-96	5	U.S. Atlantic and Gulf/Far East (TRs 12 and 22)	10[5]	18
Total Liner Trades		**165**		**891**	**1,321**

[1] Dual service privileges for containerships only, provided that sailings made by vessels calling at ports in both California (Line A) and Washington-Oregon (Line B) count toward the minimum and maximum sailings specified for each area, with the outbound and inbound portions of the sailings being counted and applied separately to determine the number of sailings serving each area.
[2] Service to/from U.S. Atlantic via California on the privilege basis with a maximum of 28 sailings.
[3] To the extent that Seabee vessels are not used on TR 21, sailings may be made with conventional vessels on the basis that two sailings are the equivalent of one Seabee vessel sailing and the maximum shall be 84 sailings annually.
[4] Pacific Far East Line's ODSA has been submitted to the Board for termination due to the company's bankruptcy which led to default on the terms of the contract.
[5] The minimum/maximum requirement of 10/18 sailings per annum is based upon the operation of five C4 Mariners on TRs 12 and 22, which are to be replaced by two LASH vessels. The minimum/maximum sailing requirements will be reduced to 8/12 when the second LASH enters service.

(Continued on Page 38)

Table 15: (Continued)

B. Bulk Trades:

Operator Contract No.	ODS Agreement: Contract Effective Date	ODS Agreement: Contract Termination Date	Number of Subsidized Ships 9/30/78	Service	Annual Sailings: Minimum No. of Days
Aeron Marine Shipping Co. MA/MSB–166	10–10–74	10–09–94	2	Worldwide Bulk Trade	335
American Shipping, Inc. MA/MSB–272	04–14–76	04–13–96	1	Worldwide Bulk Trade	335
Aquarius Marine Co. MA/MSB–309	10–15–75	10–14–95	1	Worldwide Bulk Trade	335
Aries Marine Shipping Co. MA/MSB–129	08–09–73	08–08–93	2	Worldwide Bulk Trade	335
Atlas Marine Co. MA/MSB–274	12–30–76	12–29–96	1	Worldwide Bulk Trade	335
Chestnut Shipping Co. MA/MSB–299	12–01–76	11–30–96	2	Worldwide Bulk Trade	335
Margate Shipping Co. MA/MSB–134	12–28–73	12–27–93	3	Worldwide Bulk Trade	335
Moore-McCormack Bulk Transport, Inc. MA/MSB–295	12–10–75	12–09–95	3	Worldwide Bulk Trade	335
Pacific Shipping, Inc. MA/MSB–273	07–24–76	07–23–95	1	Worldwide Bulk Trade	335
Worth Oil Transport Co. MA/MSB–271	02–20–76	02–19–96	1	Worldwide Bulk Trade	335
Zapata Products Tankers, Inc. MA/MSB–167	04–03–76	04–02–96	4	Worldwide Bulk Trade	335
Total Bulk Trades			**21**		

Table 16: SOVIET GRAIN ODS CONTRACTS IN EFFECT—SEPTEMBER 30, 1978

Company	Date Approved	Vessels
Albatross Tanker	03–08–77	ERNA ELIZABETH
American Trading Transportation	12–14–72	WASHINGTON TRADER
	12–23–75	
Atlantic Richfield	07–14–74	ARCO ANCHORAGE
		ARCO PRUDHOE BAY
	11–13–75	ARCO ENTERPRISE
		ARCO HERITAGE
	05–18–76	ARCO ENDEAVOR
		ARCO FAIRBANKS
		ARCO JUNEAU
		ARCO PRESTIGE
		ARCO SAG RIVER
Connecticut Transport	11–24–72	CONNECTICUT
Cove Tankers	10–06–75	MOUNT EXPLORER
		MOUNT NAVIGATOR
	07–13–76	COVE COMMUNICATOR
Cove Trading	09–13–78	COVE TRADER
Cove Ventures	07–06–78	COVE LEADER
Empire Transport	03–09–73	POTOMAC
Fredericksburg Shipping	12–16–76	FREDERICKSBURG
Globe Seaways	11–24–72	OVERSEAS ANCHORAGE
Ingram Ocean Systems	04–27–76	MARTHA R. INGRAM
Intercontinental Bulktank	12–05–72	OVERSEAS ALASKA
	11–30–77	OVERSEAS ALICE
International Ocean Transport	01–18–73	ALLEGIANCE
		BRADFORD ISLAND
		FORT HOSKINS
	05–03–73	BANNER
James River Transport	03–09–73	JAMES
Juniper Tankers	12–20–77	TULLAHOMA
Keystone Shipping	11–22–72	PERRYVILLE
Keystone Tankship	11–22–72	GOLDEN GATE
	03–01–74	
Manhattan Tankers	11–28–72	MANHATTAN
Mathiasen's Tanker Industries	12–13–72	SOHIO INTREPID
		SOHIO RESOLUTE
	09–24–75	JOSEPH D. POTTS[1]
Mobil Oil	05–18–76	MOBIL AERO
		MOBIL LUBE
		MOBIL MERIDIAN
Mohawk Shipping	03–09–73	MOHAWK
Monticello Tanker	04–17–73	MONTICELLO VICTORY
Montpelier Tanker	02–20–73	MONTPELIER VICTORY
Mount Vernon Tanker	12–18–72	MOUNT VERNON VICTORY
Mount Washington Tanker	12–18–72	MOUNT WASHINGTON
Newport Tankers	03–05–73	ACHILLES
Ocean Tankships	12–05–72	OVERSEAS VIVIAN
Ocean Transportation	11–24–72	OVERSEAS ALEUTIAN
		OVERSEAS ULLA
Ogden Merrimac Transport	03–09–73	MERRIMAC
Ogden Sea Transport	03–09–73	COLUMBIA
Overseas Bulktank	12–05–72	OVERSEAS ARCTIC
	02–15–77	OVERSEAS JUNEAU
	11–30–77	OVERSEAS VALDEZ

[1] Renamed the GLACIER BAY.

(Continued on Page 40)

Table 16: (Continued)

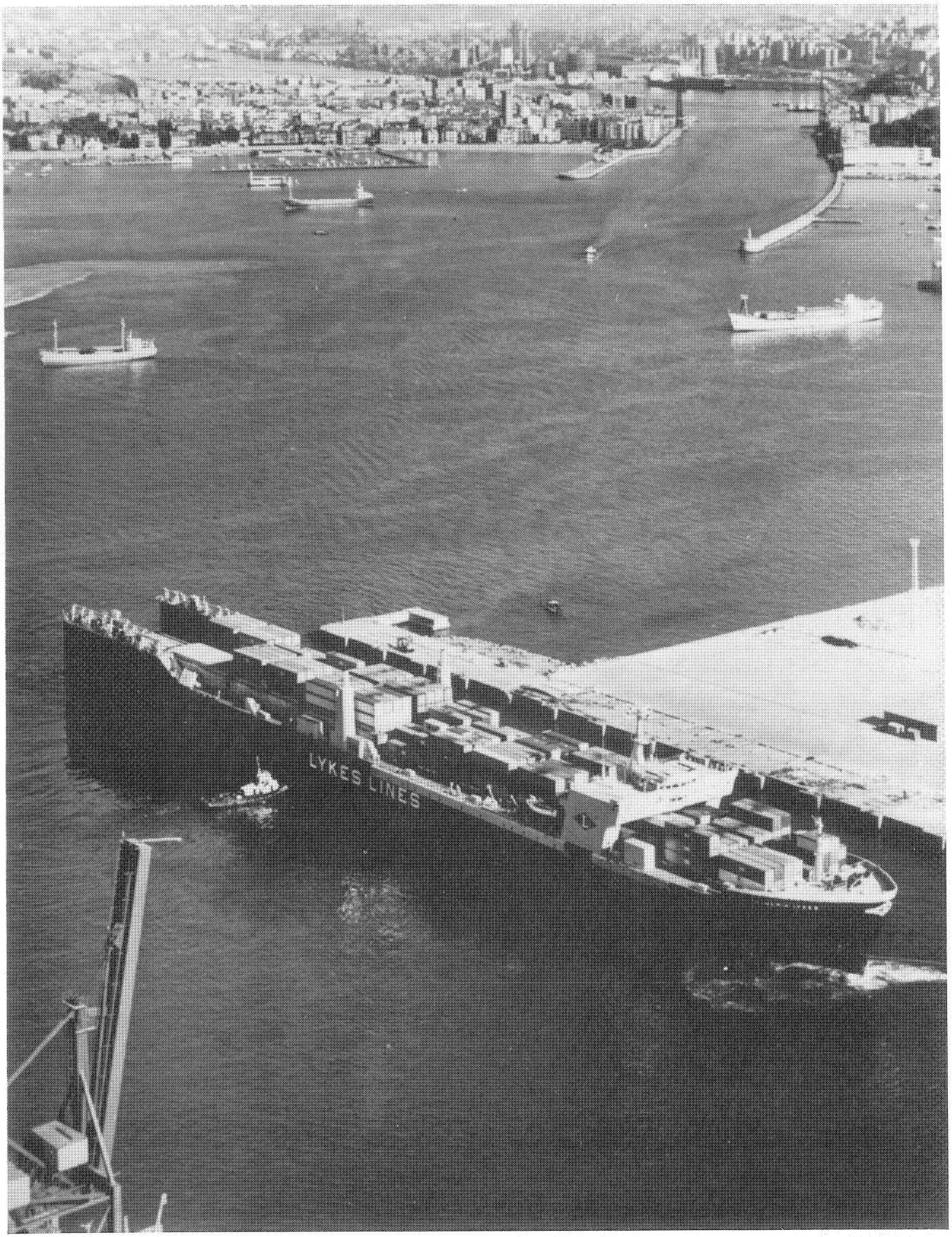
Company	Date Approved	Vessels
Overseas Oil Carriers	11–24–72	OVERSEAS JOYCE
Penn Tanker	01–03–73	OGDEN CHALLENGER
		OGDEN CHAMPION
Sun Transport	03–21–78	AMERICA SUN
		PENNSYLVANIA SUN
		TEXAS SUN
United Tanker	11–29–72	EAGLE CHARGER
		EAGLE LEADER
Wabash Transport	11–24–72	OGDEN WABASH
Willamette Transport	11–24–72	OGDEN WILLAMETTE

Table 17: FOREIGN TRANSFER APPROVALS—FY 1978

U.S. Privately Owned:

	Pursuant to Sections 9 and 37 (U.S. owned and U.S. documented)			Pursuant to Section 37 (Only) (U.S. owned, not U.S. documented)			Combined Totals		
	No. of Vessels	Gross Tons	Average Age	No. of Vessels	Gross Tons	Average Age	No. of Vessels	Gross Tons	Average Age
Tankers	6	76,935	35.0	5	118,539	20.4	11	195,474	28.3
Cargo	6	50,664	44.0	8	101,210	13.0	14	151,874	28.5
Cargo/Passenger	0	0	—	0	0	—	0	0	—
Miscellaneous	13	38,494	18.0	7	24,306	15.1	20	62,800	17.0
Total	**25**	**166,093**	**28.2**	**20**	**244,055**	**16.0**	**45**	**410,148**	**23.0**

Recapitulation By Nationality:	Sections 9 and 37		Section 37 (Only)		Combined Totals	
	Number	Gross Tons	Number	Gross Tons	Number	Gross Tons
Bahrain	1	1,469	—	—	1	1,469
Canadian	1	1,231	—	—	1	1,231
Chilean	1	4,774	—	—	1	4,774
Costa Rican	1	1,092	—	—	1	1,092
Ecuadorian	1	1,103	—	—	1	1,103
Greek	—	—	1	9,311	1	9,311
Honduran	—	—	1	6,280	1	6,280
Liberian	—	—	2	45,848	2	45,848
New Zealand	1	2,187	—	—	1	2,187
Panamanian	6	23,511	4	33,858	10	57,369
Venezuelan	1	1,036	—	—	1	1,036
Total	**13**	**36,403**	**8**	**95,297**	**21**	**131,700**
Sales Alien for Scrap Or Nontransportation Use	12	129,690	12	148,758	24	278,448
Grand Total	**25**	**166,093**	**20**	**244,055**	**45**	**410,148**



Lykes Bros.' DOCTOR LYKES, SEABEE Class barge, container and heavy-life ship, arrives in port of Bilbao, Spain.

Chapter 3

Domestic Operations

The domestic trades in America's waterborne commerce include the Great Lakes, inland waterways, and the noncontiguous ocean, intercoastal, and coastwise trades. This segment of the U.S. merchant marine annually transports more than one billion tons of cargo.

Great Lakes

Although the number of vessels in the U.S. Great Lakes fleet declined from 169 to 159 during fiscal year 1978, total deadweight tonnage rose slightly to 2.8 million dwt. (see Table 18).

A major improvement in domestic shipping noted during this reporting period was the increased carriage of western coal on the Great Lakes. Because of the low sulphur content of this coal, it is in heavy demand by electric generating plants located at or near the lakefront. Two new ships are committed solely for the carriage of western coal, and six to eight more are expected to be in service on the Great Lakes by 1985. The majority of these new ships will carry over 68,000 tons of coal and will be the maximum size (1,000 feet long and 105 feet wide) which can navigate locks in the system.

A persistent (although not insurmountable) problem inhibiting the growth of domestic and international trade on the Great Lakes is the annual freeze-up of many of the connecting rivers and substantial portions of some of the lakes. Due consideration of the environmental concerns versus commercial and economic benefits accruing to the region at large has created a deliberate, but slow pace, in the ongoing, interagency effort to bring about year-round navigation on the entire Great Lakes/St. Lawrence Seaway network. Notwithstanding a second consecutive harsh winter during the 1977-78 season, vessels operated in the upper lakes well into February and early March with a minimum of difficulty.

The Maritime Administration serves on the Winter Navigation Board, which coordinates a demonstration program by the Federal Government and State agencies to extend the shipping season. This demonstration program has developed a long-range plan and is attempting to address all concerns regarding the practicability and desirability of such an extended season, from the technical, ecological, social, and economic points of view.

In connection with this program, MarAd undertook two studies in this fiscal year—one to examine vessel waste facilities and systems within the Great Lakes and the other to evaluate cargo-handling productivity under winter conditions.

MarAd continued its efforts to assist domestic operators on the Great Lakes by providing data on such key items as cargo flows, new shipboard equipment, future manpower shortages, and new technology having application to the domestic shipping industry.

Inland Waterways

More than 640 million tons of traffic moved on the inland waterways of the United States in calendar year 1977. This traffic consisted primarily of energy products, raw materials, and agricultural commodities.

Topics of major concern during the year included waterway user charge legislation; the construction of new Locks and Dam 26, at Alton, Ill.; pollution abatement regulation; and vessel traffic control systems.

MarAd continued its promotion of inland waterway transportation in a number of ways—through its participation in River Basin Commission studies that include the Upper Mississippi, Allegheny, and Cumberland Rivers and membership in the Inland Transportation Committee Transportation Research Board, National Academy of Sciences, and the Steering Committee of the U.S. Army Corps of Engineers' National Waterways Study.

SS CORNUCOPIA, first all liquefied ammonia vessel built in United States, entered domestic trade in 1978, with principal ports of call Kenai, Alaska; Portland, Ore.; and Sacramento, Calif. Ship is owned by Union Oil Co. of California.

An innovative concept, integrated tug-barge M/V JAMIE A. BAXTER/CF-1 heads down Mississippi after delivering cargo of phosphate fertilizers to New Orleans. Tug, which may be detached from 570-foot barge during cargo transfer and movement to dry dock, is shown alone in insert (top left). Vessels, owned by CF Industries, Inc., Long Grove, Ill., are joined by hydraulic ram-locking device. Primary assignment is cross-Gulf of Mexico shipment of fertilizers from company's terminal at Tampa, Fla., to New Orleans for transshipment by northbound river barges. Self-unloading barge (CF-1) was built at Avondale Shipyards, New Orleans; tug at Peterson Builders, Inc., Sturgeon Bay, Wis.

A study to investigate efficient river shipping operations neared completion. Sponsored jointly by MarAd and the inland waterway carriers, this study will provide practical guidelines to reduce energy consumption and aid in promoting energy conservation.

MarAd continued to provide the domestic maritime community with planning and analytical data. One of these programs supplies computer printouts on the origin and destination of waterborne commodity movements in response to specific requests. A second program provides an annual report on *Domestic Waterborne Trade of the United States*. The current edition in this series, published in April 1978, covers statistical data for the years 1972-1976.

During the year MarAd worked jointly with the U.S. Coast Guard in updating life-cycle costs for use in the preparation of regulations for new tank barge construction.

Domestic Ocean Trades

Charter Market Activity

The coastwise and noncontiguous trades continued to dominate the domestic tanker market in 1978, with

Table 18: U.S. GREAT LAKES FLEET [1]—SEPTEMBER 30, 1978

	Vessels	Gross Registered Tons	Estimated Dwt.
Total	**159**	**1,628,190**	**2,828,468**
Bulk Carriers	143	1,555,947	2,787,825
Tankers	6	29,326	40,643
Others	10[2]	42,917	[3]

[1] Self-propelled vessels of 1,000 gross registered tons and over.
[2] Includes railroad car ferries, auto ferries.
[3] Not available.

movements of Alaskan oil to the lower 48 States and movements of crude and petroleum products from the U.S. Gulf to the U.S. Atlantic Coast accounting for the major share of the domestic market. In light of the continuation of depressed world tanker freight rate levels during 1978, the Alaskan trade provided a significant employment alternative for the U.S.-flag tanker fleet. It was only in the latter part of 1978 that world tanker freight rates improved. Even so, these higher rates for very large crude carriers (VLCCs) were barely above break-even levels.

The Alaskan oil market provided stable term employment for the domestic tanker fleet. The majority of the charter agreements concluded between domestic tanker operators and Alaskan crude oil producers were for periods of 1 to 3 years. Periodic shortfalls of Jones Act tankers for Alaskan oil appeared during the year. Four subsidized U.S.-flag VLCCs were granted permission to enter the trade for periods not to exceed 6 months of any 12-month period. These subsidized vessels were also required to pay back subsidy for the period of employment as required by Federal regulations. (See Chapter 11 for further details.)

The "upcoast," U.S. Gulf to U.S. Atlantic Coast, petroleum market showed significant activity in 1978, particularly in the fourth quarter, with the normal increase in heating fuel movements to East Coast consumers. Although the majority of the tankers involved in this trade are proprietary vessels owned and operated by oil companies, a substantial "spot" (single-voyage) market exists for independent tanker operators.

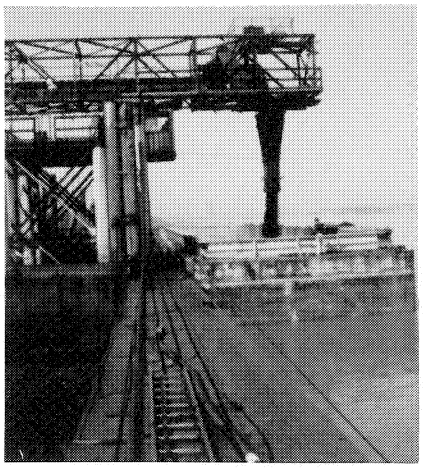
The marine transportation requirement for heating fuels in 1978 was not as great as it was during the colder winters of 1976 and 1977. However, spot market rates were at high levels.

Trade Studies

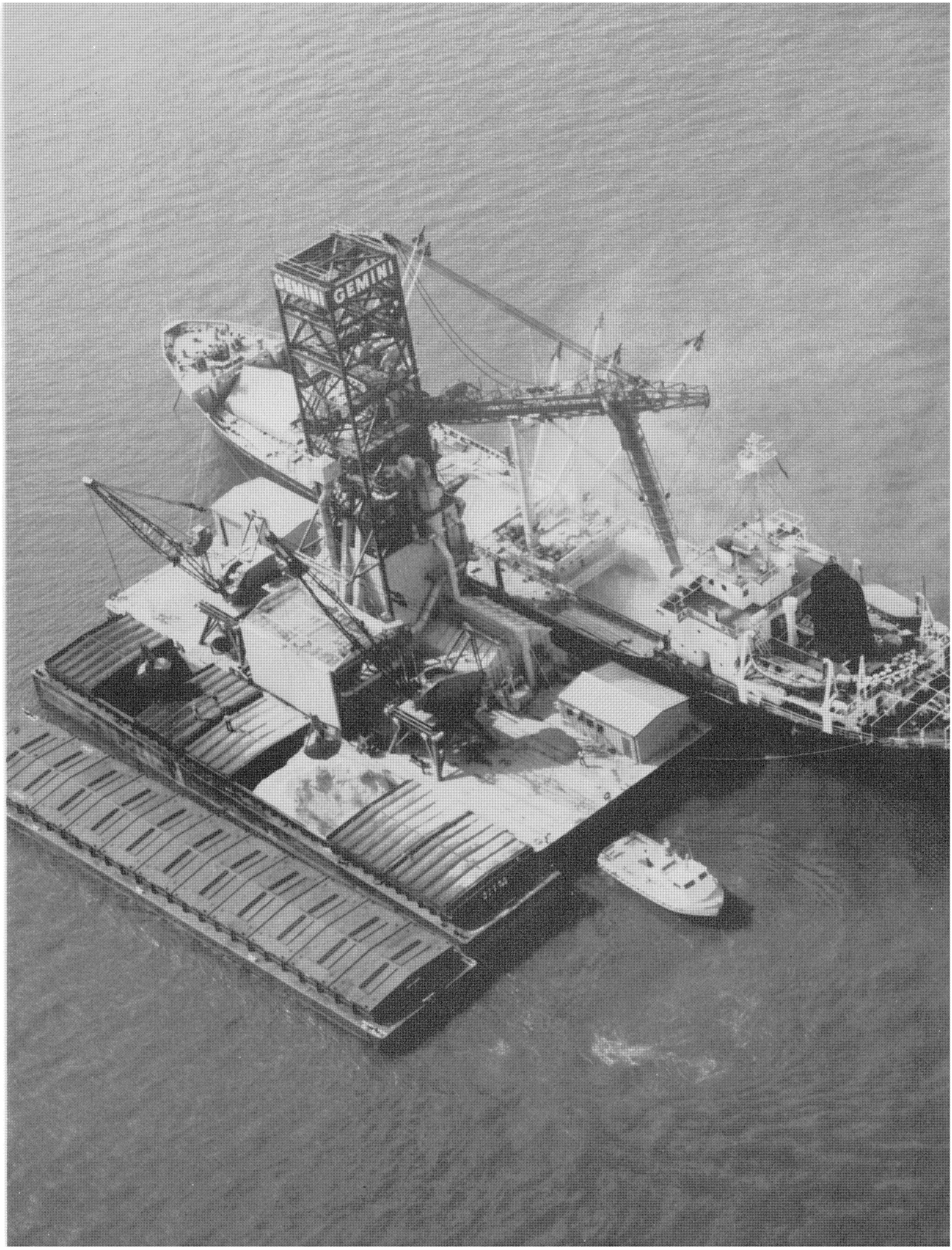
During fiscal year 1978 the Agency also conducted or continued major studies on feeder service opportunities for offshore marine service vessels and ocean transportation in the Puerto Rican trade.

An internal study of the feasibility of a domestic waterborne container feeder system for East and Gulf Coast ports used a tug design actually employed in offshore drilling operations. It concluded that such vessels could be cost competitive with both existing tug/barge feeder systems and with overland modes for shipments of up to about 400 nautical miles.

In collaboration with the Federal Maritime Commission, MarAd contributed to the marine transportation section of an Interagency Study Group on the Puerto Rican Economy, chaired by the Secretary of Commerce.



Coal moves from railroad car (not shown) on conveyor belt (top) into barge at American Terminal operated by American Commercial Barge Line Co. on the Ohio River at Louisville, Ky. Coal transfer system is one of four operated by company on Ohio and Mississippi Rivers.


GEMINI

Chapter 4

Market Development

The Maritime Administration conducts a comprehensive marketing program as part of its mandate to further the development and maintenance of an adequate, well-balanced merchant marine and to promote the commerce of the United States. Designed to increase the U.S.-flag carriage of the Nation's oceanborne foreign trade, the program encompasses:

- Developing and disseminating market information and cargo data to assist U.S.-flag ship operators in their own sales efforts;
- Maintaining contact with the country's international trade community to familiarize exporters, importers, and others with the benefits to be derived from their use of U.S.-flag ships; and
- Planning and executing, in conjunction with U.S.-flag operators, trade associations, and other industry groups, marketing programs to improve communications and response between carriers and shippers.

Marketing Program

MarAd has regional marketing representatives in 10 U.S. cities in addition to its Office of Market Development staff in Washington, D.C. During the year these trade specialists made marketing contacts with policymaking officials of 2,257 firms in foreign commerce. As a result, nearly 900 U.S. companies—including 174 listed in the FORTUNE 500—have issued policy directives to their traffic managers supporting the Agency's "Ship American" promotional program.

Voluntary reports from shippers and carriers indicate that during the past 5 years the marketing program has produced more than $126 million in U.S.-flag ocean freight revenues that otherwise would have gone to foreign carriers.

In FY 1978 U.S.-flag shipping companies continued their utilization of MarAd's Computerized Shipper Information and Market Lead Systems, to provide a competitive marketing edge in the American merchant marine. The Shipper Information System furnishes trade intelligence about U.S. exporters and their commodities, with a data base built on marketing contacts and interviews conducted by MarAd's regional market development trade specialists. The Market Lead System identifies and tracks business opportunities for U.S.-flag carriers, the data base being built on market intelligence received through private sector sources as well as Government channels. The computer capabilities permit information to be tailored to specialized markets or other specific requests of U.S.-flag carriers.

MarAd continued its joint participation with other Federal, State, and local agencies in trade shows, forums, and other programs promoting U.S.-flag shipping, including export promotional presentations under the Commerce-Cities Program jointly sponsored by the Industry and Trade Administration, another agency of the Commerce Department.

In connection with MarAd's Commodity Target Program, liaison was maintained with a number of industry trade associations. Trade specialists prepared information and articles for use in several trade journals and Department of Commerce foreign trade business reports and service publications designed to carry the "Ship American" message to specialized markets.

In FY 1978 the Maritime Administration terminated its formal ties with the National Martime Council (NMC). Composed of chief executives of United States-flag carriers, shipyards, maritime labor organizations, and the Assistant Secretary of Commerce for Maritime Affairs, the Council was formed in 1971 with the assistance of MarAd. MarAd's Office of Market Development had acted as Executive Secretariat for the Council.

In directing that MarAd's relationship with the NMC be formally severed on July 25, 1978, the Secretary of Commerce said the decision did not "in any way suggest a lessening in our resolve to promote and support the U.S. maritime industry, and specifically programs that encourage American exporters and importers to ship their cargoes on U.S.-flag vessels. MarAd will continue its market development and promotional programs, which are essential in fulfilling its mission to develop a strong American merchant marine."

During FY 1978 the Agency emphasized the continued, national need to modernize and expand the nearly extinct U.S.-flag dry-bulk fleet. Based upon its consultations with potential vessel operators, cargo interests, and the financial community, the Agency has formulated what it believes is a viable program containing the necessary incentives to encourage private-sector investments in U.S.-flag dry-bulk shipping. At the end of the fiscal year this program was undergoing final development. (See Chapter 2 for additional information.)

Grain from America's heartland is transferred from Mississippi River barge to ocean carrier in Port of New Orleans for delivery overseas. GEMINI transfer rig for use in midstream was developed by Jeffboat, Inc., Jeffersonville, Ind.

Inauguration of service on new trade route linking Great Lakes-St. Lawrence Seaway ports with South America and Caribbean is marked in Detroit with presentation of engraved plaque to Capt. S. P. Andersen (right above) of Lykes Bros. Steamship's SS GULF BARKER by George J. Ryan, MarAd's Great Lakes Region Director. At Detroit Harbor Terminals' dock (right) GULF BARKER takes on cargo of Chrysler auto parts destined for Colombia and Venezuela. Lykes also provides liner service between Great Lakes and the Mediterranean, Black Sea, and Middle East.

Foreign Trade Forecasting Program

Trade forecasts are essential for planning the growth of the U.S.-flag merchant fleet. MarAd analyzes foreign trade data and economic conditions to project cargo market demands by commodity and geographic region. The forecasts help in evaluating the operational and financial feasibility of U.S.-flag shipping services over the long term.

In addition to preparing forecasts in response to special requests, during FY 1978 the Agency published *A Long-Term Forecast of U.S. Waterborne Foreign Trade 1976-2000* (NTIS order number PB 274-600/AS).

U.S.-U.S.S.R. Bilateral Liner Cargoes

During FY 1978 four U.S.-flag liner operators provided direct shipping services to the Soviet Union under terms of the U.S.-U.S.S.R. Maritime Agreement. Two others participated in this trade with transshipment services.

In calendar year 1977 the U.S. accountable liner share of freight revenues amounted to $19,310,566 as compared to a Soviet share of $19,148,869.

Preference Cargoes

The Cargo Preference Act (Public Law 83-664) requires that at least 50 percent of all Government-generated cargo subject to the law be shipped on privately owned U.S.-flag commercial vessels if such vessels are available at fair and reasonable rates. (All military cargo for use by the United States must be shipped on U.S.-flag vessels.)

The Maritime Administration monitors the shipping activities of more than 65 Federal agencies, the Export-Import (Ex-Im) Bank, and the Foreign Military Credit Sales program to assure that applicable cargo preference statutes are followed. Data for most of these programs are recorded on a calendar-year basis.

Table 19: GOVERNMENT-SPONSORED CARGOES [1]—CALENDAR YEAR 1977

Public Law 664 Cargoes:

Shipper	U.S.-Flag Revenue ($1,000)	Total Metric Tons	U.S.-Flag Metric Tons	Percentage U.S.-Flag Tonnage
Agency for International Development:				
Loans and Grants	50,613	3,112,287	855,608	27[2]
P.L. 480—Title II	67,518	1,372,672	785,501	57
Department of Agriculture:				
P.L. 480—Title I	116,045	4,545,940	2,078,178	46[2]
Other Agricultural Programs	48	67	64	96
Department of Commerce	208	464	422	91
Department of Defense:				
Foreign Military Credit Sales	16,381	96,199	62,535	65
Military Assistance Program	1,007	4,003	3,597	90
Department of Energy:				
Energy, Research & Development Adm.	490	27,101	8,714	32[2]
Strategic Petroleum Reserve	3,027	1,300,664	438,392	34[3]
Department of Health, Education & Welfare	42	66	58	88
Department of the Interior:				
Bonneville Power Administration	236	7,092	4,215	59
Bureau of Reclamation	80	228	185	81
Other	37	116	104	90
Department of Justice	54	72	71	99
Department of State (other than AID)	6,061	9,109	7,593	83
Department of Transportation	15	36	22	61
Department of the Treasury	8	16	12	73
Inter-American Development Bank	[4]	33,810	27,844	82
National Aeronautics & Space Administration	147	341	310	91
Smithsonian Institution:				
International Exchange Service	19	107	74	69
National Museum of Natural History	11	20	19	99
Tennessee Valley Authority	383	2,187	1,540	70
U.S. Information Agency	1,294	3,848	3,616	94
Other[5]	39	62	45	73

Public Resolution 17 Cargoes:

	Total Freight Revenue	U.S.-Flag Freight Revenue	Percentage U.S.-Flag
Export-Import Bank	$166,100,456	$138,500,078	83

[1] Civilian agencies plus Department of Defense Foreign Military Credit Sales Program and Military Assistance Program (other Department of Defense cargoes not included).
[2] U.S.-flag deficit due to nonavailability of vessels for specific cargoes.
[3] See text for explanation of U.S.-flag deficit.
[4] U.S.-flag revenue not available.
[5] Cargoes of agencies which generate less than 100 metric tons of cargo per year.

A computer-aided system and concentrated interagency liaison permitted MarAd to process approximately 31,000 ocean bills-of-lading covering shipments of these cargoes in 1977. This represented a 29 percent increase over 1976.

U.S.-flag participation in the shipment of these Government-sponsored cargoes during calendar year 1977 is summarized in Table 19.

In November 1977 the Maritime Administration published its final rules (46 C.F.R. 381.7) regarding shipments generated under Federal grants, loans, guarantees, and advance-of-funds programs. These rules provide specific guidelines to agencies administering programs not subject to Federal Procurement Regulations. MarAd advised and assisted these agencies in their efforts to implement this requirement to use American-flag vessels. The new rules are expected to result in significant revenue increases for U.S.-flag carriers.

Due to a lack of available U.S.-flag services, three agencies/programs—AID, Loans and Grants; U.S.D.A., P.L. 408, Title I; and the Energy Research and Development Administration—failed to meet the minimum 50 percent U.S.-flag requirement of the Cargo Preference Act.

Strategic Petroleum Reserve

By the end of FY 1978, some 44 million barrels of oil for the Department of Energy's (DOE's) Strategic Petroleum Reserve (SPR) had been stored in salt domes on the Gulf Coast. Under the SPR program, the Federal Government seeks to stockpile 750 million barrels of oil by 1986.

The Cargo Preference Act requires that at least half of this oil, as Government-generated cargo, be shipped in U.S.-flag tankers to the extent they are available at fair and reasonable rates. Because of procurement, shipping, and other complexities involved in the SPR program, it soon became evident to both DOE and MarAd that to monitor P.L. 664 compliance on the basis of long tons might result in U.S.-flag carriers' securing less than an equitable share of the revenues generated by the cargo.

Late in 1977 the agencies concluded an agreement which provides that long ton/miles (not tonnage alone) determine the equitability and compliance with the law. Long ton/miles reflect both the tonnage loaded and revenue derived by the vessel since revenue is proportional to the distance traveled by the vessel. Based on tonnage alone, for example, U.S.-flag tankers loaded 431,464 long tons, or 34 percent of the calendar year 1977 SPR total, but when long ton/miles were calculated it was found the U.S. tankers had achieved 1,365,799 long ton/miles—only 16 percent of the total.

The low U.S.-flag carriage under this program to date essentially has been due to temporary problems, including start-up difficulties at storage sites and the fact that DOE initially determined it was more efficient and economical not to charter vessels but to rely instead on "spot buys" of cargoes in-transit and on contracts for deliveries in vessels provided by the crude oil contractors. No U.S.-flag cargoes were offered on the "spot buys," and all initial contracts were awarded on the basis of contractor delivery to the U.S.-Gulf ports, resulting in delivery by foreign-flag vessels.

However, contracts awarded in the program for deliveries in late 1977 and the first half of calendar year 1978 provided for transfer of ownership at origin of approximately 76 percent of the crude oil purchases, and this allowed for SPR liftings in U.S.-flag vessels.

With the resolution of these shipping problems, it appears that in 1978 and in subsequent years U.S.-flag vessels will receive their share of the SPR cargoes.

Department of Defense

Under the Department of Defense's Foreign Military Credit Sales program in calendar year 1977, both total tonnage and freight revenue levels declined from the previous year, due principally to the reduction of cargoes to Jordan. However, the U.S.-flag tonnage share increased from 55 to 65 percent and the program accounted for $16.4 million in U.S.-flag freight revenues.

In this reporting period MarAd received its initial shipping reports on the Department of Defense Military Assistance Program. These shipments are generated through grants made by the U.S. Government and are handled by the Military Sealift Command. The U.S. merchant marine received 90 percent of the tonnage and over $1 million in freight revenue from this program during calendar year 1977.

Delta Steamship Lines' DELTA NORTE, 40,000-dwt. LASH vessel, at her berth in Port of New Orleans.

Export-Import Bank

MarAd also administers Public Resolution 17, 73rd Congress (P.R. 17), which requires all cargoes generated by the Export-Import Bank to be shipped on U.S.-flag vessels, unless a statutory or general waiver is granted by MarAd. Statutory waivers are permitted when U.S. vessels are not available at reasonable rates and schedules. General waivers are granted to permit vessels of a recipient nation to carry up to 50 percent of ocean cargoes generated by these Ex-Im loans, provided that U.S.-flag carriers are not subject to discrimination in trade with that nation.

As a result of an agreement concluded with officials of the bank, an intensive program was initiated by MarAd and Ex-Im in 1977 to improve U.S.-flag shipping and reporting procedures. One of their actions was to write new loan and guarantee recipients, emphasizing the U.S.-flag requirements. MarAd also contacted suppliers participating in these programs in a further effort to promote the timely selection of U.S.-flag carriers.

In calendar year 1977, the bank's programs generated more than $166.1 million in freight revenue; the U.S.-flag share was $138.5 million, or 83 percent.

Chapter 5

Port and Intermodal Development

During FY 1978, MarAd completed or initiated several port studies dealing with economic impacts, planning and development, and port and terminal operations.

The Agency also continued its port and intermodal equipment and facilities program, which provides technical assistance in the areas of terminal facilities, inventory, services, assessment, and facility and cargo protection.

A key element in MarAd's ports program was the continued coordination with other local, State, regional, and national efforts to improve port facilities and operations. Increased emphasis was placed on cost-sharing of port planning studies and technical assistance programs.

Through its regional offices, MarAd also served as technical consultant on port projects administered by the Economic Development Administration (EDA), also an agency of the Department of Commerce. EDA grants and loans for port-related public works have totaled more than $175 million since 1965. MarAd also provided technical review and port-related recommendations to the Office of Coastal Zone Management in the National Oceanic and Atmospheric Administration, another agency of the Department of Commerce, on individual State coastal zone management plans.

Towers and bulkers, tugs and bridge dot busy Port of Long Beach, which has two supertanker terminals (Atlantic Richfield Co. and Texaco, Inc.) with 60 feet of water.

The Maritime Administration has in this past year assumed a key role in a new Department of Commerce demonstration program—entitled the Commerce-Cities Project—by promoting port development and export opportunities to enhance local economic development.

Port Planning Program

To obtain more precise information about the U.S. port industry's impact on the national economy, MarAd sponsored a study that revealed that our ports, in moving the Nation's waterborne commerce, in 1977 generated:

- $56 billion in gross sales within the economy
- A $30 billion contribution to the gross national product
- 1,046,800 jobs
- $19.2 billion in personal income
- $7.4 billion in business income
- $10.4 billion in Federal taxes
- $4 billion in State and local taxes.

These impressive totals were derived from the creation of an economic model based on input-output data supplied by the Department of Commerce and represent the combined direct and indirect contributions of the port industry to the Nation's economy. This first nationwide economic evaluation of the U.S. port industry was completed for MarAd during FY 1978 by the Port Authority of New York and New Jersey.

One of the important contributions of the study, *Economic Impact of the U.S. Port Industry: An Input-Output Analysis of Waterborne Transportation*, was the development of a definition of the port industry that would be useful and accurate for any port economic study. It is: "The port industry is any activity directly needed in the movement (transfer) of waterborne cargo." This includes the direct production of pierside transfer services, plus activities that take place beyond the pier—cargo documentation, cargo insurance, banking, warehousing, land feeder service, and waterborne carriage of cargo.

This major study provides policymakers in Government and business with a new and versatile tool for analyzing and assessing the economic impact of alternative policies relating to the U.S. port industry.

The Maritime Administration also shares the costs and actively participates in master planning initiated by regional port associations and State agencies. Three major cooperative port planning studies begun in the past 4 years have been completed; three others were underway and five were contracted for in FY 1978. These projects encompass plans for all or parts of 33 States.

Two container cranes now are operational at Sea-Land's Portsmouth/Hampton Roads container terminal. A second crane was installed in 1978.

Hundreds of containers and Roll-On/Roll-Off (RO/RO) vans await handling at intermodal terminal in Port of New Orleans' tidewater area. In past 5 years, Port has invested more than $65 million to develop this facility, located at junction of Mississippi River-Gulf Outlet and Inner Harbor Navigational Canal.

By 1980 MarAd will have identified port facility needs in 38 of the 40 States that have access to waterborne transportation. If recommendations of these studies were implemented, the Agency estimates, 10 percent of the some $300 million invested annually in U.S. port development and improvements could be saved.

Seven of these States are covered in three new studies—plus extensions of two current studies—planned for FY 1979. As basic objectives, each will estimate future cargo movements and then match port capabilities and requirements for the region.

MarAd's port planning program stresses cost-sharing in research and development. In six of the studies contracted in FY 1978 MarAd funding totaled $475,000 and State/local funding, $572,000.

Work was completed this fiscal year on the Florida Port System Study which was begun in FY 1976 by MarAd and the State of Florida Department of Transportation and Ports Council.

Cooperative port plans were completed in previous years with the Washington (State) Public Ports Association and the City of Portland; the Northern California Ports and Terminals Bureau (San Francisco); and the East-West Gateway Coordinating Council, which developed a primer on inland waterways ports through a study of the Port of St. Louis, Mo.

Two other studies, which were initiated in 1977 as cooperative efforts involving ports in the Mississippi River Basin and Gulf Coast region and the eight Great Lakes States, continued during the fiscal year.

Several other port studies, some undertaken by MarAd's Office of Port and Intermodal Development and others performed under contract, were underway or completed during the fiscal year. These included an *Assessment of U.S. Port Facility Requirements; Economic Impact of U.S. Merchant Marine and Shipbuilding Industries; Current Trends in Port Pricing; The Effects of Federal Standards on U.S. Port Development;* and a *Study of Port Planning Criteria*.

Several other regional port planning projects were let to contract in FY 1978. These studies establish port planning programs with the States of Alaska, Hawaii, Maryland, Oregon, and Texas and represent a total investment of $575,000. Each contains unique features which emphasize and expand port planning techniques recently developed.

The study of *MarineTransport in Western Arctic Alaska* brings planning tools to bear on water and land transport interchange needs in a virgin but developing region.

The *Hawaii Cooperative Port Planning Study* looks at the role of, and need for, an inter-island ferry system in that State's economy, the contributions of a foreign trade zone in port development, and the potential to Pacific trade of a mid-Pacific transshipment center located in the islands.

The *Texas Port Planning Study* adopts Texas' "Activity Assessment Routine" to an evaluation of sites suitable for dredge spoil disposal, and tests MarAd's Port Economic Impact model against Texas' regional input/output matrices.

The *Northeast Regional Coal Demand Study*, being cost-shared with the Niagara Frontier Transportation Authority, estimates demand for western low-sulfur coal in the Northeastern States and the feasibility of a transfer facility at Buffalo, N.Y.

The *Oregon Port Planning Study* incorporates the Columbia and Snake River ports into the State's port demand and capacity assessment, then requires that study findings be used to adapt the Coastal Zone Management Plan.

The *Maryland Port Planning Study* evaluates the movement of goods at the Port of Baltimore as a prelude to a statewide port planning study in FY 1979.

Other projects, vital to general port planning in times of peace and national emergencies, included:

Conference on U.S. Port Industry Data Requirements—Two conferences with port industry officials in Chicago and Washington, D.C., to define the type and level of detail required for port-related (trade, carrier, operating, etc.) data. The Washington conference demonstrated the use of computer terminals for data retrieval and manipulation.

Economic Impact Kit Project—A MarAd-funded project by the Pacific Coast Association of Port Authorities to develop a standard and simplified technique for estimating port economic impact at the local level.

National Waterways Study—A 3-year study of existing and future waterway requirements. MarAd cooperates, through technical and data resources, with the Corps of Engineers in this Congressionally funded project.

Emergency Berth Utilization Reporting System —A computerized port management system for assigning vessels to berths and reporting their locations during times of national emergency.

Conservation of Energy at Port Terminals—An audit of energy uses and consumption rates at port terminals with a recommended conservation plan, undertaken with the initiative of the American Association of Port Authorities. (This contract went to a Washington, D.C., area minority firm.)

Analyses of port liability insurance and Great Lakes capital attraction are planned for the future. The latter study will identify the benefits of public and private investment in Great Lakes port facilities.

Equipment and Facilities Program

MarAd also helps American port authorities and terminal operators to increase their competitiveness and benefit from new maritime technology. This technical assistance is designed to minimize the port segment of the costs of ocean and domestic waterborne transportation. As in port planning, MarAd shares program costs with State and local governments and industry, wherever practicable.

Major projects completed in FY 1978:

Automated Management Control System for Public Marine Terminals, Phase I—A study which identified requirements for control of containerized cargo and design of an advanced computerized system to fulfill such requirements. Conducted with operational input from terminals in Baltimore, Md., and Norfolk, Va., the analysis indicated that in a terminal which now handles 100,000 containers per year, the proposed system could increase throughput by 25 percent and simultaneously save $1.3 million in ship time and terminal costs annually.

Vessel In-Port Locator System—The design of a computerized information system to coordinate in-port vessel operations, followed by a technology exchange conference to assist voluntary implementation among appropriate U.S. ports.

Improved Fendering System, Phase I—A state-of-the-art study of fender design and evaluation of maintenance and repair practices. The project was undertaken with the Port of New Orleans and the American Association of Port Authorities.

Marine Firefighting Cost Effectiveness Study—A comparison of improvement programs, including both institutional and equipment alternatives, based on an analysis of marine firefighting experience and system costs. The study was conducted jointly with National Fire Prevention and Control Administration.

Major projects in progress during FY 1978:

Improved Productivity for Bulk Facilities in the Great Lakes Area—An assessment of costs and benefits of alternative means of upgrading or constructing bulk facilities, initiated by a recommendation from the 1976 U.S. Great Lakes and Seaway Port Development and Shipper Conference.

Tanker Berthing Evaluation—Development of test data to evaluate adequacy of berth clearances and procedures at tanker terminals through the use of the navigational simulator and tug effect program of MarAd's Computer-Aided Operations Research Facility (CAORF) at Kings Point, N.Y. This study is being conducted jointly with the U.S. Coast Guard. (For more information on CAORF, see Chapter 6.)

Tug Firefighting Module—Development and demonstration of a prototype pump and fire monitor system to enable tugs to be used as auxiliary fireboats in a fire emergency, conducted jointly with support from the National Aeronautics and Space Administration, the Coast Guard, and a U.S. pump manufacturer. The portable module could be flown by helicopter to a tug near the scene of a harbor fire at four times the speed of a conventional fireboat.

RO/RO Terminal Study for Hawaiian Inter-Island Service—Evaluation of terminal costs for alternative vessel and service concepts.

Equipment and Facilities program projects completed or underway in

Caterpillar tractor weighing 180,000 pounds is hauled aboard SHIRLEY LYKES at Milwaukee for shipment to Malaga, Spain.

FY 1978 encompassed some $845,000 in MarAd funding and $306,000 by others.

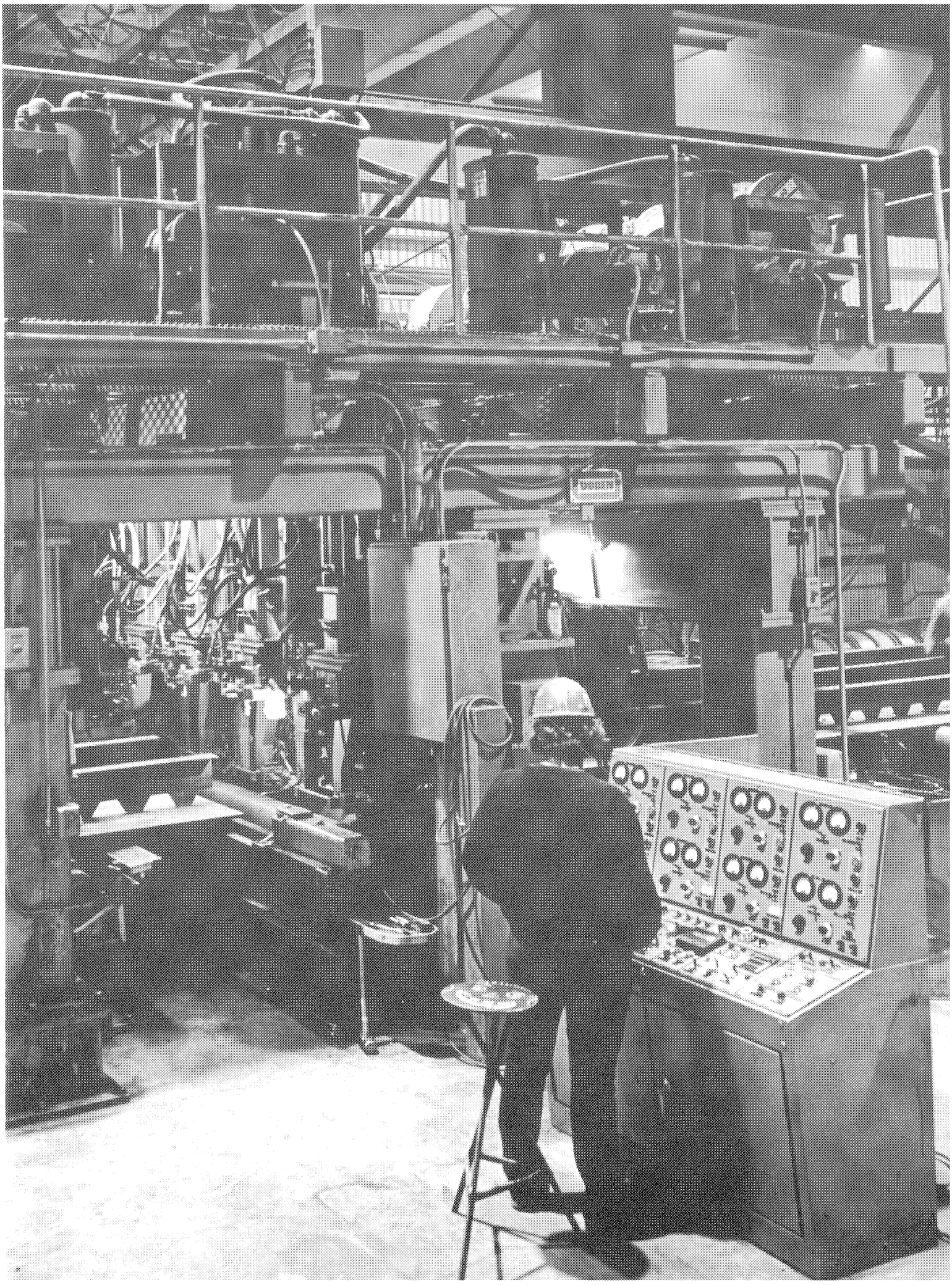
Commerce-Cities Project

The Maritime Administration participates in the Department of Commerce's Commerce-Cities Project, a part of the President's national urban program. The project is designed to assist cities by integrating and allocating Departmental resources and services in support of local investment strategies. Eight other Commerce agencies provide resources.

In 10 demonstration cities, local officials, private sector leaders, and representatives of Commerce agencies have met to analyze city needs, identify specific assistance available, and develop an appropriate plan of action. MarAd assistance in port planning, export development, maritime research and development, and training have been planned for several cities. In coordination with the other agencies, MarAd has begun actions to accomplish the locally identified goals.

Regional Activities

MarAd's four regional offices, continuing their support of the port planning program in FY 1978, provided survey data and analyses, terminal capacity assessments, and capital expenditure estimates for the national port capability study. The Eastern and Central Region Offices reviewed applications for a number of port development projects funded by EDA. The Central Region continued its work on hurricane warning and preparedness. The Western Region was instrumental in formulating the port studies for Alaska, Hawaii, and Oregon, and participated actively in the Northern California port impact study. The Great Lakes Region Office worked with local and State officials and industry in advancing the Great Lakes Cooperative Port Study and concurrent studies. It also arranged the first review meeting in Cleveland, Ohio, to report the progress being made in carrying out a 5-year program formulated by Government and maritime industry representatives at a Great Lakes planning conference in Dearborn, Mich., in April 1976.



Chapter 6

Research and Development

The objective of MarAd's research and development (R&D) programs is to develop methods, equipment, and systems to make the U.S. shipbuilding and ship operating industries more efficient, competitive, and productive. The Agency works closely with industry through contracted research projects to improve all aspects of marine transportation.

Government-industry cost sharing is a key element of the cooperative R&D program built up over the last several years. During FY 1978 MarAd committed $19 million to research projects. Industry contributed an additional $7.6 million.

Appendix III lists the wide range of R&D contracts awarded by MarAd in FY 1978.

Innovations in welding techniques to increase productivity in ship construction are among major objectives in Maritime Administration's research and development program, which is cost shared with industry. The new panel-line welding machine shown here, at Bay Shipbuilding Corp., Sturgeon Bay, Wis., can locate and weld up to four stiffening-bars on steel plate simultaneously. Stiffening-bars (or stiffeners) are angle-bars or stringers, welded to surface to increase ship plate's rigidity.

Shipbuilding

Approximately 125 projects have been funded since the Shipbuilding Research Program was begun 7 years ago. Most have been, or soon will be, completed.

Most projects involve development and demonstration of advanced technology for shipbuilding, including welding, ship outfitting, production methods, manufacturing automation, and guidelines for production-oriented ship designs.

Among several important initiatives in FY 1978 was a cost-shared contract with a major U.S. shipyard for the design and development of a computerized, semi-automated, pipe-fabrication facility. When completed, this facility will be one of the most advanced and productive in the world. A preliminary study determined its technical feasibility and has indicated that significant cost savings will be achieved.

A second major undertaking was the creation of a shipbuilding standards development program. This project has the support of the U.S. Coast Guard, the American Bureau of Shipping, and the U.S. Navy, in addition to that of the industry. The American Society for Testing Materials has formed a Shipbuilding Standards Committee as a result of this endeavor. This program is expected to produce the first comprehensive body of National Standards for Shipbuilding since World War II and help reduce the cost of designing and constructing ships in the United States.

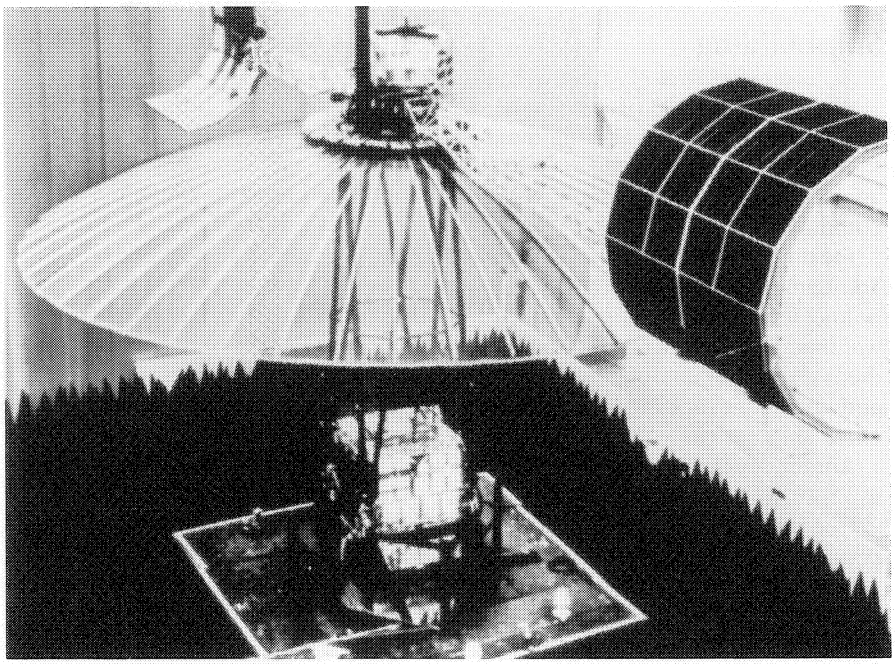
Another new program applies industrial engineering disciplines to ship construction. The American Institute for Industrial Engineers is assisting in this activity.

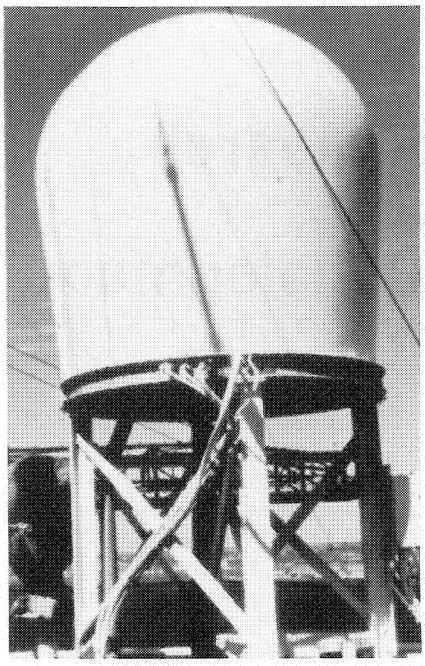
Ship's Machinery

MarAd research in ship's machinery concentrates on reducing fuel consumption and improving the performance of marine prime movers. Emphasis is placed on the more efficient combustion of fuels in marine boilers and diesel engines. Extensive tests and evaluations are conducted at sea to quantify the performance changes associated with heavy marine residual bunkers.

During this reporting period MarAd assessed the reliability improvement of such key marine components as throttle-control systems, steering gears, sterntube bearings and seals, tanker inerting, ventilation and gas-freeing systems, and tank-level gauging systems.

Also in FY 1978, a multiphase program to fit a contra-rotating propeller to a commercial merchant ship was initiated. This system offers 10 to 13 percent improvement in overall propulsion efficiency.





Installations of MARISAT systems aboard U.S.-flag vessels nearly doubled (increasing to 59—including 21 merchant ships) in FY 1978, first full year of its worldwide operation. Marine satellite communications/navigation system is outgrowth of Maritime Administration R&D. First of three satellites in MARISAT global network undergoes pre-launch tests (above left), with antenna deployed in same mode it now maintains in stationary orbit high above Atlantic Ocean. Other satellites are in orbit over Pacific and Indian Oceans. Shipboard MARISAT link is through radomes like one pictured above right aboard U.S. Lines' containership AMERICAN ACE.

Nuclear Ships

Although funding for the Competitive Nuclear Merchant Ship Program has been reduced to minimal levels in FY 1978, related activity continued with the U.S. Coast Guard and U.S. Nuclear Regulatory Commission to develop an international code for nuclear merchant ships.

During the fiscal year the Intergovernmental Maritime Consultative Organization's Working Group on the Safety of Nuclear Ships prepared a final draft of a proposed code. The goal is an international agreement on standards for design, construction, and operation of nuclear merchant ships and the development of procedures for the admission of nuclear ships into the commercial ports of all maritime nations.

SOIS Program

Projects in FY 1978 were directed towards completion of the Shipping Operations Information System (SOIS) program. SOIS is a computer-based management-control system designed to improve the day-to-day operations of U.S.-flag ocean carriers.

These SOIS projects include a vessel configuration system to determine the most profitable mix of LASH barges and containers to be carried on a LASH vessel operating on Trade Route 27 (U.S. Pacific to Australia/New Zealand). In addition, several of the SOIS modules are involved in tracking and tracing, analysis of damage, and recording of utilization statistics for container equipment. Other modules perform similar functions for SEABEE barges. Finally, an operational evaluation was completed on a system which determines the optimum sequence for shipboard loading of containers.

Cargo Handling

Two major cargo-handling studies were completed during the fiscal year. One identifies, describes, and compares methods for handling and carrying freight by a marine carrier. The other reviews a plan for commercial containerships to be used as military sealift vessels to replenish combatant naval vessels at sea. A new project, dealing with the transport of outsized military cargo by commercial containerships, was initiated during the year.

The cargo-handling R&D program was revised during the year to provide for greater maritime industry participation. Of four projects begun at the end of FY 1978 the first is to be cost-shared one-third industry and two-thirds MarAd, and the others on an equal basis. The projects include the development of a container cargo-stowage manual; remote monitoring of refrigerated cargo; moisture control and terminal layout and selection of terminal equipment.

Navigation/Communications

The fiscal year saw continued growth within the U.S.-flag fleet of MARISAT, a commercial marine satellite communications and navigation system, which was an outgrowth of MarAd R&D. The number of vessels equipped for the service nearly doubled.

The Agency also participated in final International Maritime Satellite (INMARSAT) Preparatory Committee meetings. When implemented, INMARSAT will assure continuity of satellite service to U.S.-flag vessels and make it available to the merchant fleets of all nations.

In the area of terrestrial services, MarAd supported the development of an automated Digital Selective Call (SELCALL) marine communication system for worldwide maritime use. A U.S. application would involve the Inland Waterways Very High Frequency Communication System planned to serve western rivers.

Advanced Ship Systems

During FY 1978 joint MarAd-industry programs reflected the need to meet the future vessel requirements of the U.S. merchant fleet.

Seven steamship operators joined with MarAd in a cost-shared venture to develop a next-generation cargo liner utilizing advanced, U.S.-developed technology. Trade projections for seven different trade routes were developed, and optimized vessel requirements formulated.

In the charter segment of shipping, MarAd initiated the development of a standardized U.S.-flag dry-bulk carrier. Twenty-eight dry-bulk shippers and ship operators, aided by a group of four contractors, assisted the Agency in developing the project.

Operators of small vessels assisted MarAd in a similar effort—a "mini-trailership" study completed during FY 1978. This study examined opportunities for small RO/RO vessels operating over short trade routes and with reduced crews. Significant opportunities were identified in the Gulf Coast-to-Caribbean trade and in trade across the Great Lakes. Because of special operator interest on the Great Lakes, the study is being expanded in that area.

A study of tanker transportation of oil and gas from Northwestern Alaska also was completed during the fiscal year. It concluded that icebreaking tankers could transport Northwestern Alaskan petroleum resources at significantly lower cost than other means. A complementary study, being cost-shared with the Department of the Interior, was initiated to examine the feasibility of petroleum transportation from the National Petroleum Reserve in Alaska.

CAORF

MarAd's Computer-Aided Operations Research Facility (CAORF) at Kings Point, N.Y., completed its second full year of operation in FY 1978. CAORF is the only simulator in the world that integrates the ship and its pertinent physical and control characteristics; the port or waterway with shoreline and moving traffic; wheelhouse equipment and navigation aids in the water; the ocean environment; and, finally, the person controlling the ship.

During this reporting period the efficiency and capabilities of CAORF were enhanced to a point where it was engaged in research projects for 60 hours per week, as compared to 32 hours per week in the first year. Approximately two-thirds of the experimental time was assigned to MarAd research projects and one-third to experiments requested by other Federal and local agencies or by industry.

Self-contained mobile laboratory for conducting research on perishable commodities in transit has been introduced by Sea-Land Service. Lab, housed in 40-foot container, travels aboard ship and on land. Full-time scientist operates unit in cooperation with Sea-Land research staff in Elizabeth, N.J.

MarAd's experiments considered complicated situations in collision avoidance, e.g., in ports and waterways; tested and established the feasibility and advantages of a Marine Radar Interrogator Transponder in ship control and navigation; and investigated a vessel traffic control system.

CAORF experiments for the U.S. Coast Guard involved establishment of safe tanker operating rules in Puget Sound; development of ship pilot and master training/certification requirements; completion of Rules-of-the-Road investigations; and various aids-to-navigation experiments.

Other CAORF activities during the fiscal year included:

- Experiments to evaluate the safety of a proposed LNG facility at Point Conception, Calif., and to develop operating and docking procedures;
- Continuation of operational exercises related to the movement of tankers in and out of Valdez, Alaska; investigation of the ship control and navigation skills of watch officers; and expansion of the CAORF human factors data base.
- Start of a study of port entry procedures for LNG carriers into Port Arun, Sumatra.

Marine Science

MarAd continued to cooperate with other Government agencies and the maritime industry in developing the technology to extend the ship operating season on the Great Lakes. Work was completed in FY 1978 on a project to develop an improved design for an ice-transiting bow. Seven Great Lakes shipping companies joined MarAd in funding this $230,000 effort.

Related hull-form research, using both models and full-scale measurements, also was continued. Preliminary studies were completed on the effectiveness of air-cushion vehicles in ice-breaking both on the Great Lakes and in the Arctic.

Other areas of study in Marine Science included propeller cavitation; the motion of a vessel in confined

waters; tandem propellers; and resistance, propulsion, and manuevering characteristics of bulk vessels in shallow waters.

Market Analysis

The Agency expanded its market analysis capability into three areas: assessments of market requirements and opportunities, market economics, and market information.

Marketing studies were undertaken to:

- Determine marine transportation requirements and opportunities for trade with developing nations over the next 10 years;
- Define the market for ocean transport of U.S. perishable imports and exports and determine the segment available to U.S.-flag operators;
- Determine Great Lakes shipping requirements for the emerging movement of western coal to satisfy midwestern demands for energy; and
- Develop strategies for increased U.S.-flag carriage of general cargoes moving in large-lot sizes in both the liner and nonliner trades.

Two market information projects were undertaken during the fiscal year. The first sought to develop a computerized system to provide the Agency and U.S.-flag carriers with current information on competitive shipping services offered on essential U.S. trade routes. The second project sought to develop advanced techniques for reliable short-range trade forecasting.

In market economics, a project was begun to determine the effects of cargo pooling and bilateral shipping agreements on America's maritime commerce.

Energy/Environment

During FY 1978 the Department of Commerce and the Department of Energy (DOE) signed a memorandum of understanding to cooperate in activities involving energy systems on the ocean, including ocean thermal energy conversion (OTEC). MarAd is providing on-site assistance to DOE in its OTEC-1 megawatt electric test system.

MarAd's R&D related to the transportation of liquefied natural gas (LNG) continued, and the first supplement to the LNG Data Book was distributed. It included topics such as physical characteristics of LNG and LNG ship materials, as well as loading and navigation safety factors. The Data Book was distributed to LNG shipbuilders and ship operators.

Research was completed on an Arctic ship-powering and development plan identifying areas of ship technology needing further investigation.

Exploratory research on the economics and technology needed for the development of toxic chemical incinerator ships neared completion during the fiscal year, while work was concluded on the design of a shipboard waste-treatment system utilizing ozone for treatment of liquids while burning solids in ship's boilers.

Also essentially completed was an assessment of the use of a cavitating jet for cleaning ship hulls of biofoulants, both in drydock and underwater at pierside.

JUNE 19

Chapter 7

The Marine Environment and Energy Conservation

The Maritime Administration conducts programs to preserve the quality of the marine environment and enhance the conservation and more efficient use of energy in the maritime industry. During FY 1978, the Agency:

- Assisted in the Government's projects to eliminate ocean dumping by supporting an incineration-at-sea economic and environmental viability analysis.
- Prepared an environmental impact statement on Title XI tank vessels engaged in the domestic trade.
- Continued efforts to assure compliance with MarAd standards for pollution abatement in subsidized tankers.
- Explored tanker design alternatives for pollution abatement.
- Participated in a number of international conferences and technical meetings on ocean pollution abatement and control (see Chapter 10).
- Continued participation in the activities of the Joint U.S.-U.S.S.R. Task Group on Prevention and Cleanup of Pollution of the Marine Environment from Shipping.
- Performed operational studies of maneuvering situations at the Computer-Aided Operations Research Facility maneuvering simulator to reduce the chances of marine pollution related to accidents.
- Conducted a study to evaluate energy-consumption profiles.
- Recorded further reductions in fuel consumption in the maintenance of the National Defense Reserve Fleet.

Environmental Protection

MarAd seeks to promote and maintain a pollution-free marine environment through its own programs and by assisting other agencies and organizations, including the development of international ship construction and operational standards.

Ocean dumping is a serious threat to the marine environment. The Secretary of Commerce is authorized by the Marine Protection Research and Sanctuaries Act to support measures to eliminate this practice. One such measure is the development of a chemical-waste incinerator ship.

In 1977 MarAd awarded a contract to study the economics and environmental viability of a U.S.-flag incinerator ship in disposing of hazardous wastes (see also Chapter 6). As a part of this ongoing study, the Agency has compiled estimated total outputs of toxic waste for the major waste-producing industries in the United States. The portion of that waste which could practicably be incinerated at sea has been determined and the quantities extrapolated to 1983 and 1989. Calculations also have been performed on the economics of ocean incineration based on the conversion of a T2 tanker into an experimental incineration ship.

Environmental Impact Statement

In FY 1978 MarAd submitted a draft environmental impact statement (EIS) on tank vessels financed under the Title XI program to the Environmental Protection Agency and the public for review. A final EIS is expected to be issued on Title XI tankers in 1979.

TELEDYNE 19, jackup drilling vessel built for Teledyne Movible Offshore, Inc., at Bethlehem Steel's Beaumont, Tex., shipyard, reflects increased business generated for U.S. ship construction industry by offshore energy exploration. Vessel is capable of drilling to 25,000 feet in water depths up to 250 feet.

Crews of Alyeska Pipeline Service Co. ships practice oil-spill recovery work in Valdez, Alaska, area, with U.S. Coast Guard observation vessel nearby. Cooperative program underscores joint effort by Government and industry to protect marine environment; minimize any damage that might occur from oil spill in shipping Alaskan crude south to lower 48 States.

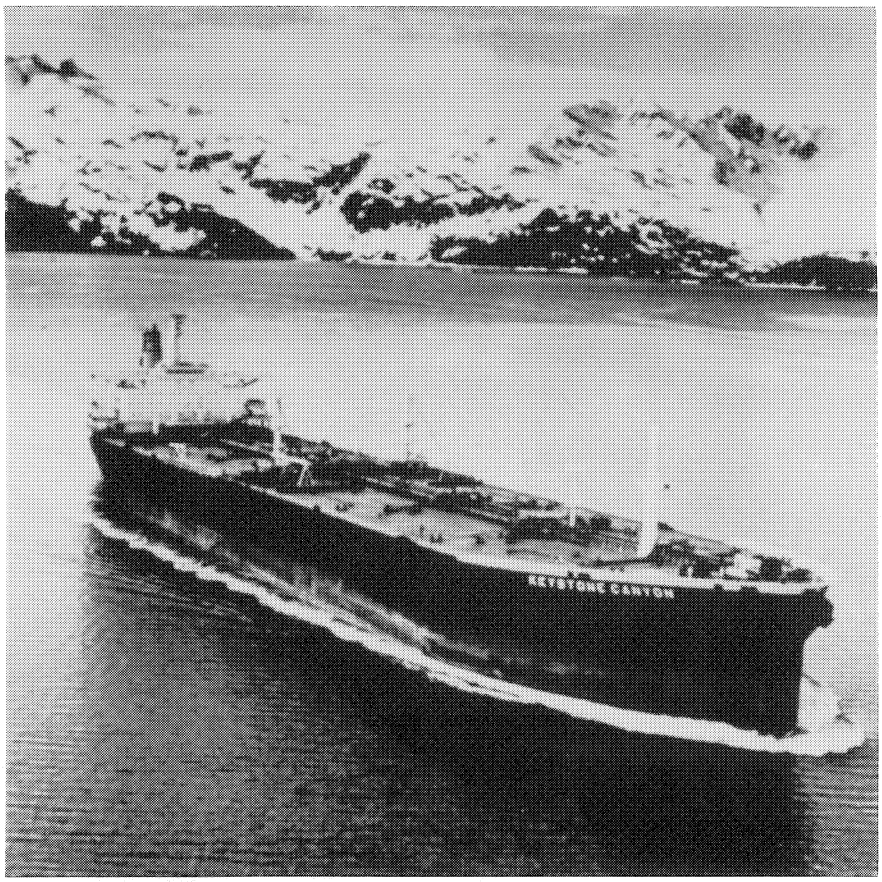
During this reporting period MarAd also reviewed and commented on draft environmental impact statements from other agencies on LNG terminals, storage sites for the U.S. Strategic Petroleum Reserve, vessel traffic services, outer continental shelf resource development, coastal zone management plans, and other subjects.

Construction Standards

During FY 1978 MarAd achieved full compliance with Docket A-75, under which the Maritime Subsidy Board stipulated that all tank vessels built with construction-differential subsidy meet the pollution-abatement requirements in the Agency's Standard Specification for Merchant Ship Construction.

In advance of the International Conference on Tanker Safety and Pollution Prevention (TSPP), held under auspices of the Intergovernmental Maritime Consultative Organization (IMCO) in London in February 1978 (see Chapter 10), the Agency provided to the U.S. delegation a study of the economic and environmental considerations on retrofitting segregated ballast tanks in the world tanker fleet. In May 1978 MarAd completed an in-house study in response to one of the questions raised by the Conference, viz. what the economic effects of the TSPP requirements would be on the U.S. tanker fleet. The study concluded that retrofit costs would approach $224 million for the entire U.S.-flag fleet.

Later in the year MarAd joined the U.S. Coast Guard and others in an interagency examination of the environmental risks associated with oil shipments in the U.S. domestic trade. The interagency group sought to determine whether there are any design, construction, or operating standards which could be applied to tankers in the domestic trade which were exempted by the 40,000-dwt. IMCO Conference requirements.



KEYSTONE CANYON arrives at Valdez to take aboard another load of Alaskan oil. 164,000-dwt. tanker, built at Avondale Shipyards for SOHIO under Title XI ship financing guarantees program, began trading regularly between Valdez and Parita Bay, Panama, in February 1978.

Operational Standards

Standards of ship operation—including crew requirements, crew training, watchkeeping standards, vessel traffic control systems, and aids to navigation—also were advanced considerably in this reporting period. Operational standards are critical to pollution prevention because of the high incidence of oil spills caused by human error.

MarAd participated in IMCO's International Conference on Training and Certification of Seafarers held in London from June 14-July 7, 1978—a significant step forward in improving crew standards internationally (see also Chapter 10). The new treaty, the 1978 International Convention on Standards of Training, Certification and Watchkeeping of Seafarers, is designed to promote safety of life and property at sea and protection of the marine environment.

During this fiscal year also, MarAd's Computer-Aided Operations Research Facility (CAORF) in Kings Point, N.Y., conducted a series of operational exercises and studies which contributed to the understanding of problems (notably, human error) involved in ship operations which could adversely affect the environment. (These pollution-abatement and safety-related projects are among CAORF activities described in Chapter 6).

Energy Conservation

The Maritime Administration continued its efforts to enhance energy conservation and encourage the more efficient use of energy in the U.S. maritime industry and its own operations in FY 1978.

In its maintenance of the National Defense Reserve Fleet (NDRF) the Agency further reduced the consumption of electricity and diesel fuel. FY 1973 marked the beginning of and serves as the base year for the Federal Energy Managament Program of which the NDRF effort is a part.

Compared to the base year, the consumption of electricity at MarAd reserve fleet sites in 1978 declined by some 3.2 million kilowatt hours, or about 56 percent, while diesel fuel consumption was reduced by 5,362 gallons, or nearly 3 percent less than the total used in FY 1973.

Chapter 8

Maritime Manpower

The Maritime Administration's manpower program seeks to ensure the availability of highly qualified officers for the U.S. merchant marine and provides up-to-date, "hands-on" training to qualified seafarers. These goals are made all the more challenging by revolutionary changes in ship design and cargo handling that have occurred in recent years. The Agency also strives to maintain peaceful and productive relations between maritime labor and management.

Seamen's Training

MarAd operates Radar Training Centers in New Orleans, New York, San Francisco, Seattle, and Toledo. Trainees include qualified merchant seamen; operators of inland waterway, offshore drilling, and mining vessels; maritime academy students; and personnel of the National Oceanic and Atmospheric Administration, U.S. Coast Guard, U.S. Army Corps of Engineers, and U.S. Naval Reserve.

During the fiscal year 2,822 students received training in collision-avoidance radar navigation, gyrocompass, and LORAN at the five schools. In addition, the training centers at San Francisco and Toledo overhauled their existing radar equipment and installed new LORAN C simulators.

Firefighting and damage control courses for merchant seamen are offered by MarAd at Earle, N.J., and Treasure Island (San Francisco) in cooperation with the U.S. Navy's Military Sealift Command (MSC) and the U.S. Coast Guard. A total of 3,830 seafarers completed training during the reporting period, a 24 percent increase over FY 1977.

In anticipation of new Coast Guard requirements for merchant seamen, MarAd is expanding its firefighting training program. Plans for this expansion include additional training capability at the Earle facility and the establishment of standardized firefighting training facilities at locations on the Great Lakes, Gulf Coast, and West Coast. During the reporting period two new MarAd firefighting instructors and one U.S. Coast Guard damage controlman began work at the Earle facility.

MarAd actively participated during the year in activities of the Maritime Training Advisory Board's Subcommittees for the Development of Effective Firefighting Training and for Educational Coordination. In fiscal 1978 the subcommittee on firefighting assisted in the development of the firefighting training film "What We Owe Each Other," which was funded by the U.S. Fire Administration. This film is the first of a planned series of 12, and will be incorporated into MarAd's expanded firefighter training program. Members of this same subcommittee reviewed draft manuscripts of a standard firefighting handbook being developed by the Agency under a contract which is expected to be completed in FY 1979.

During the third quarter a special 4-week course in marine diesel engineering designed for active merchant marine engineering officers with steam licenses was started at the U.S. Merchant Marine Academy, Kings Point, N.Y. The course is approved by the U.S. Coast Guard as being equivalent to the 6 weeks of marine diesel experience which steam engineers must acquire before qualifying to take diesel upgrading examinations. There is a substantial list of applicants for the course in FY 1979.

In August 1978 the Navy reinstituted the Merchant Marine Reserve, U.S. Naval Reserve Program. The program is to be implemented formally

Members of Regiment of Midshipmen hold morning colors at U.S. Merchant Marine Academy, Kings Point, N.Y. In June 1978 Kings Point graduated its first coeducational class—first ever at any Federal Officer-training service academy. Eight percent of current enrollment is female.

Cry of "Fire in the engine room!" brings sailor-turned-actor to electrical blaze in switchboard (above left) before two members of ship's fire party (wearing masks; top right) arrive to extinguish flames. Scenes are from firefighting training film "What We Owe Each Other," funded by U.S. Fire Administration, another agency in Department of Commerce. MarAd was active participant in planning of production, starring member/trainees at National Maritime Union's Upgrading and Retraining School. This and other firefighting motion pictures planned as part of series will be incorporated into MarAd's expanded supplemental training program.

in March 1979. Its purpose is to establish and maintain in the U.S. merchant marine an organization of seagoing personnel trained in naval procedures, to insure that there is effective coordination with U.S. naval forces in times of peace, national emergency, or war. Licensed merchant marine officers who hold Naval Reserve commissions with specified designator codes are eligible for this training. The program has been supported strongly by MarAd because it enhances the national defense role of the U.S. merchant marine, one of the policy objectives of the Agency.

During this reporting period MarAd also provided technical assistance to the governments of Sudan, Egypt, and Iran in developing maritime training programs.

Merchant Marine Academy

The U.S. Merchant Marine Academy trains young men and women to serve as merchant marine officers and leaders in the American maritime industry. The Academy offers courses in marine and nautical sciences, nuclear engineering, mathematics, the humanities, and transportation. In addition to 3 years of classroom training, midshipmen (men and women) spend a year at sea on American-flag vessels.

All graduates receive U.S. Coast Guard licenses and Bachelor of Science degrees. In addition, about 95 percent of all Kings Point graduates are commissioned as Ensigns in the U.S. Naval Reserve.

The Class of 1978 included 146 third mates, 82 third assistant engineers, and 16 graduates who completed the dual deck/engine program and were certified to serve as deck and engineering officers. Among the graduates were eight women, the first women to graduate from any Federal service academy.

After the June commencement, 84 percent of the 244 graduates found employment at sea or went on active duty in the Navy or the Coast Guard. This employment upsurge was brought about mainly by increased retirements from the active seagoing workforce.

Table 20: MARITIME MANPOWER AVERAGE MONTHLY EMPLOYMENT

	Average Monthly Employment in Fiscal Year:	
	1977	1978
Seafaring Shipboard Jobs:	**26,831**	**26,662**
Shipyard:[1]	**115,971**	**123,759**
Production Workers	92,459	97,983
Management and Clerical	23,512	25,776
Longshoremen:	**56,515**	**52,100**

[1] Commercial yards able to construct ships 475 by 68 feet. (General Dynamics/Groton, Conn., was added to the list of yards in January 1977.)

Members of Congress nominated 2,440 constitutents for the Class of 1982. From these nominations, 354 appointments were made, with all but 11 states being represented.

Average enrollment at the Academy during the year was 1,070.

At the start of the 1978-1979 school year the Regiment of Midshipmen included 89 women. Twenty-two women are scheduled for graduation in 1979.

State Maritime Academies

The Maritime Administration provides financial aid to the six State maritime academies in the United States in accordance with the Maritime Academy Act of 1958. That legislation, in turn, provides for the training of merchant marine officers to meet national objectives stated in the Merchant Marine Act of 1936, as amended.

In June 1978, 579 merchant marine officers were graduated from the State academies, which are located at Vallejo, Calif.; Castine, Maine; Buzzards Bay, Mass.; Traverse City, Mich.; Fort Schuyler, N.Y.; and Galveston, Tex. After the June commencement, 474 of the graduates reported finding employment at sea or were serving on active duty in the Navy or the Coast Guard. In addition to U.S. Coast Guard licenses, graduates of five academies received Bachelor of Science degrees (Associate Degrees are awarded at the Michigan Academy) and, if qualified, were commissioned as Ensigns in the U.S. Naval Reserve.

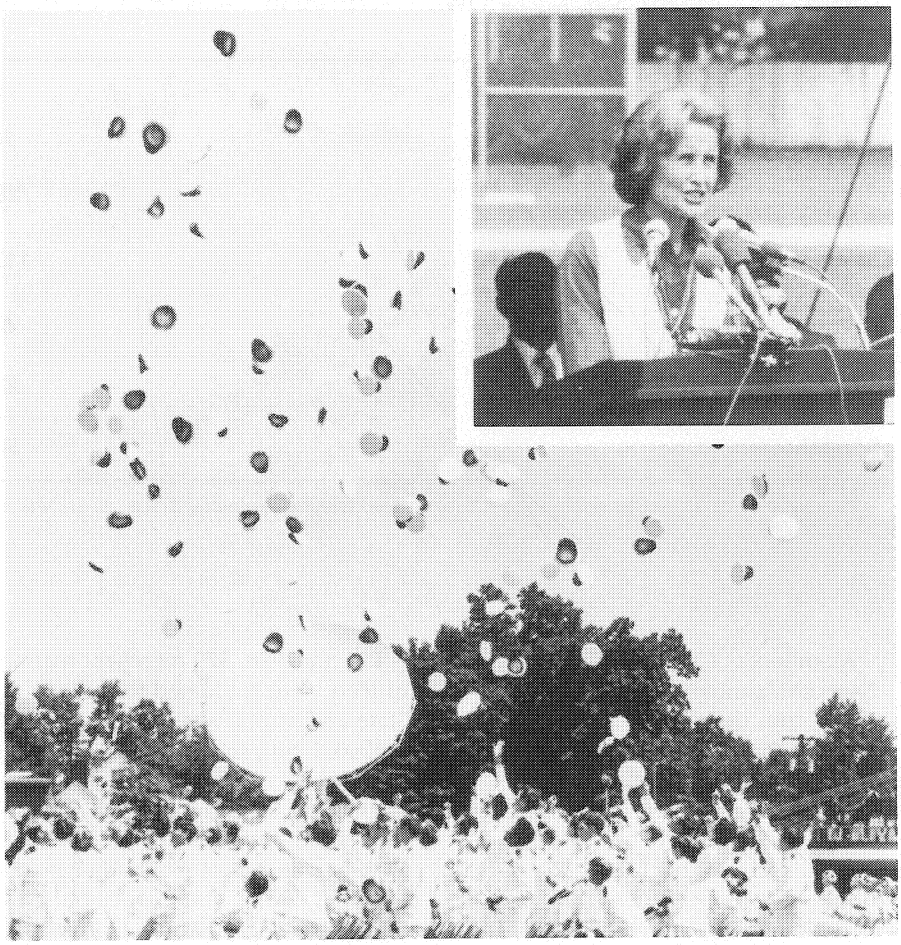
Labor Relations

Fiscal year 1978 saw substantial unrest in shoreside labor relations, led by a 2-month longshoremen's strike at the beginning of the reporting period. However, relations between seafaring labor and management continued the generally harmonious pattern established in the early 1970s.

On October 1, 1977, the International Longshoremen's Association (ILA)—representing longshoremen in ports from Searsport, Maine, to Brownsville, Tex.—launched a selective strike to demand job security against the inroads in employment opportunities made by technologically advanced ships.

Prior to the strike, the ILA and its West Coast counterpart, the International Longshoremen's and Warehousemen's Union (ILWU), signed a mutual aid pact by which they guaranteed to honor each other's picket lines. With the advent of the strike, ILA sent pickets to the West Coast to picket East Coast and Gulf Coast shipping companies operating ships out of West Coast ports. The ILWU honored the ILA picket lines until October 12, 1977, when arbitrators ruled such action to be illegal.

Hats of graduating midshipmen fly into air (left), culminating 4 years of study at Kings Point. Secretary of Commerce Juanita M. Kreps (insert) delivers 1978 commencement address at U.S. Merchant Marine Academy.



A new agreement was reached November 29; most ILA locals ratified the new contract and agreed to return to work in early December. The strike affected 25,000 workers; at one time over 100 ships were reported strikebound.

On February 17, 1978, an ILA local in Mobile, Ala., struck over issues of a pension funding dispute and rotation of gangs. On March 9, a Federal judge ordered longshoremen to load a grain vessel in Mobile, and an agreement was signed on March 10.

In June 1978 sporadic strikes broke out at West Coast ports as a result of the acquisition by Delta Steamship Lines, Inc., of 11 ships owned by Prudential Lines, Inc.

The major seafaring labor unions renegotiated their contracts this year with wage increases averaging 7.5 percent. There were no major work stoppages involving the deep-sea workforce—though some unions did not agree to terms until after the expiration date of the agreements, June 16, 1978.

Labor Data

Average monthly seafaring employment in all sectors—private, Government contract, and Great Lakes—declined slightly to 26,622 jobs in FY 1978, from 26,831 in the previous year (see Table 20). This decline was partially due to the longshore strike.

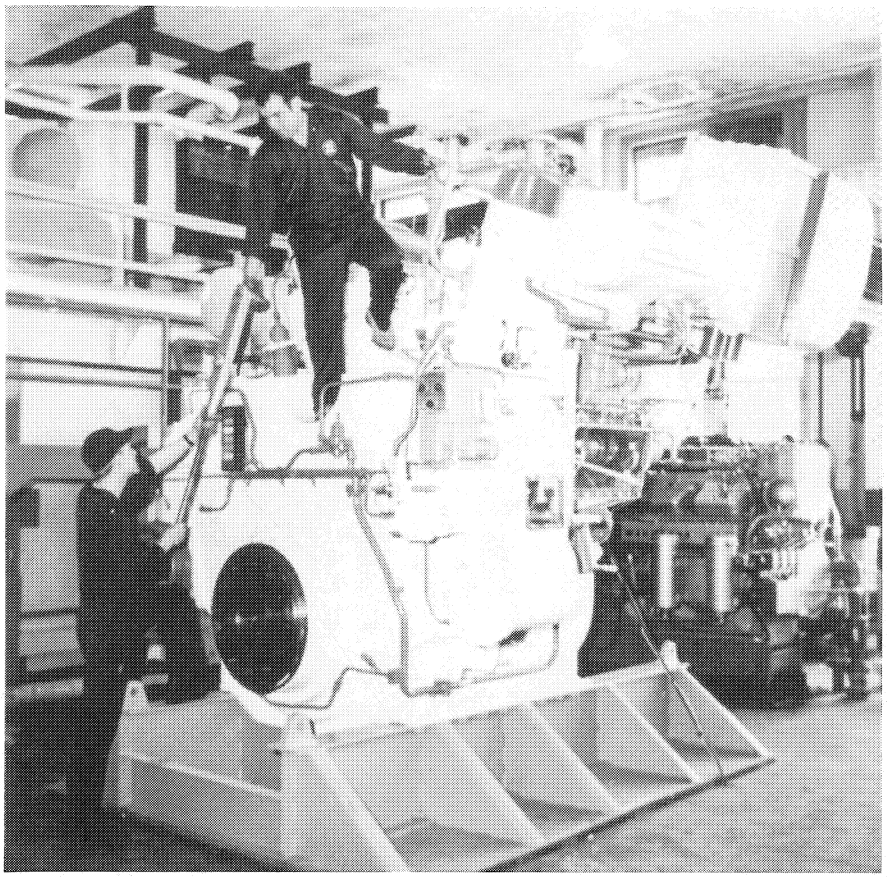
The total workforce in selected commercial shipyards was 123,759 in FY 1978. Average monthly longshore employment declined from 56,515 to 52,100.

The Agency completed an analysis of the active seafaring workforce, using its computer-based Seamen's Employment Analysis System, which draws upon information gathered by the U.S. Coast Guard.

The system describes the workforce in terms of age, skill level, and area of employment. The analysis indicated that the total number of merchant seamen finding full or part-time employment aboard U.S.-flag vessels during calendar year 1977 was 72,980. This figure does not include civil service personnel aboard MSC ships and persons working on inland waterways other than the Great Lakes.

Two studies were undertaken during FY 1978. The first was an emergency plans seafaring workforce supply and demand forecast model entitled *Civilian Seafaring Manpower Requirements in Peace and in War 1978-1984*, prepared jointly by the Maritime Administration and the Military Sealift Command. The study examined various manning scenarios under conditions ranging from peace to war mobilization.

The second study, *Great Lakes Officers Supply and Demand 1978-1987*, was under development at the end of FY 1978. It is a model which examines current and future supply and demand conditions on the Great Lakes. This study was instituted at the request of the Great Lakes maritime industry, which has reported shortages of licensed deck and engine officers to such a severe extent that the U.S. Coast Guard has prevented a number of vessels from sailing.



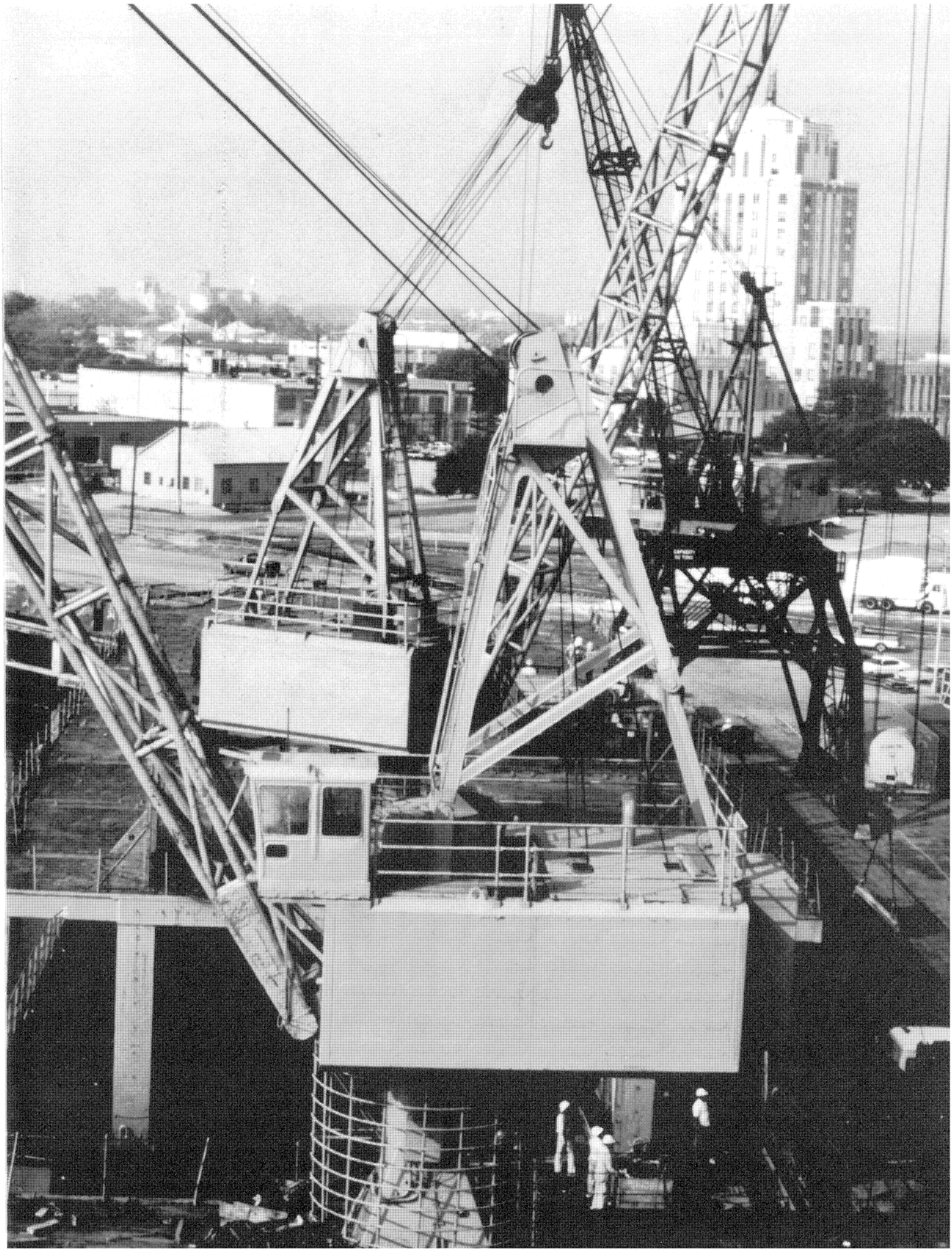
Midshipmen undergo training at U.S. Merchant Marine Academy's newly expanded Marine Diesel Engineering Facilities. Continuing Education Program for licensed marine engineers was begun at Kings Point facilities in FY 1978.

Merchant Marine Awards

The Merchant Marine Medals Act of 1956 authorizes the Secretary of Commerce to grant medals and decorations for outstanding and meritorious service or participation in national defense action.

The Merchant Marine Distinguished Service Medal was presented to Able Seaman Robert L. Koncher of the SS EXXON SAN FRANCISCO. This recognition was for his heroic actions in putting out a major fire on his ship on January 27, 1977, while the tanker was docked at Baytown, Tex. On his own initiative, Able Seaman Koncher single handedly activated the firefighting equipment and stayed on board to search the burning vessel for other personnel.

Merchant Marine Meritorious Service Medals were presented to Glenn E. McDonald, Captain of the tug boat LITTLE MAC, and the vessels' mate, Bill Kenney. This recognition was for their skillful seamanship in the rescue of 55 passengers and crew members from a jet downed in Escambia Bay near Pensacola, Fla., on May 8, 1978.



Chapter 9

National Security

One of the Maritime Administration's primary concerns is national security. To ensure that the U.S. merchant marine is capable of meeting America's waterborne shipping needs in times of national emergency, the Agency maintains the National Defense Reserve Fleet (NDRF) as a ready source of vessels for military logistic support and works closely with the U.S. Navy and other agencies on national security matters.

During fiscal year 1978 Navy-MarAd liaison was increased or improved in a number of areas. These cooperative ventures—ongoing activities, as well as comprehensive planning—are described in this chapter and elsewhere in this report. They included an expansion of the Ready Reserve Fleet, improved naval-maritime fleet communications, training, shipbuilding standards, a mobilization ship design project, and other joint efforts intended to enhance the sea power of the United States.

Two cranes aboard SS WASHINGTON and one at dockside in Port of Rotterdam appear to be sparring for cargo as they bring aboard U.S. Air Force equipment for return to America during REFORGER exercise conducted this fiscal year. WASHINGTON was activated from U.S. Ready Reserve Fleet for annual military operation.

Reserve Fleet

Vessels of the NDRF are available for use in both military and nonmilitary emergencies, such as commercial shipping crises. They include nonactive merchant ships as well as naval auxiliaries anchored at three locations —James River, Va.; Beaumont, Tex.; and Suisun Bay, Calif. (see Table 21).

On September 30, 1978, the NDRF consisted of 306 ships. This figure excludes three ships undergoing preactivation as part of the Ready Reserve Fleet and one ship which had been sold but not delivered. Also excluded are three Pacific Far East Line, Inc., containerships—the SSs JAPAN BEAR, GOLDEN BEAR, and THOMAS E. CUFFE—moored in the Suisun Bay Reserve Fleet. The U.S. District Court, Northern District of California, appointed the fleet superintendent substitute custodian for the U.S. Marshal while the ships remain in the custody of the Court.

During the fiscal year 7 ships were added to the fleet and 39 were withdrawn. Of the withdrawals, 26 had been sold, in FY 1978 and previously, for scrapping and nontransportation use. One vessel, the passenger liner SS UNITED STATES, was sold for operation but has not yet been delivered (see Chapter 2).

The number of ships in the Fleet Preservation Program—which involves conventional preservation, dehumidification, and cathodic protection—declined from 215 to 211 during the year.

The number of vessels in the National Defense Reserve Fleet at the end of fiscal years 1945 through 1978 is shown in Table 22.

Ready Reserve Fleet

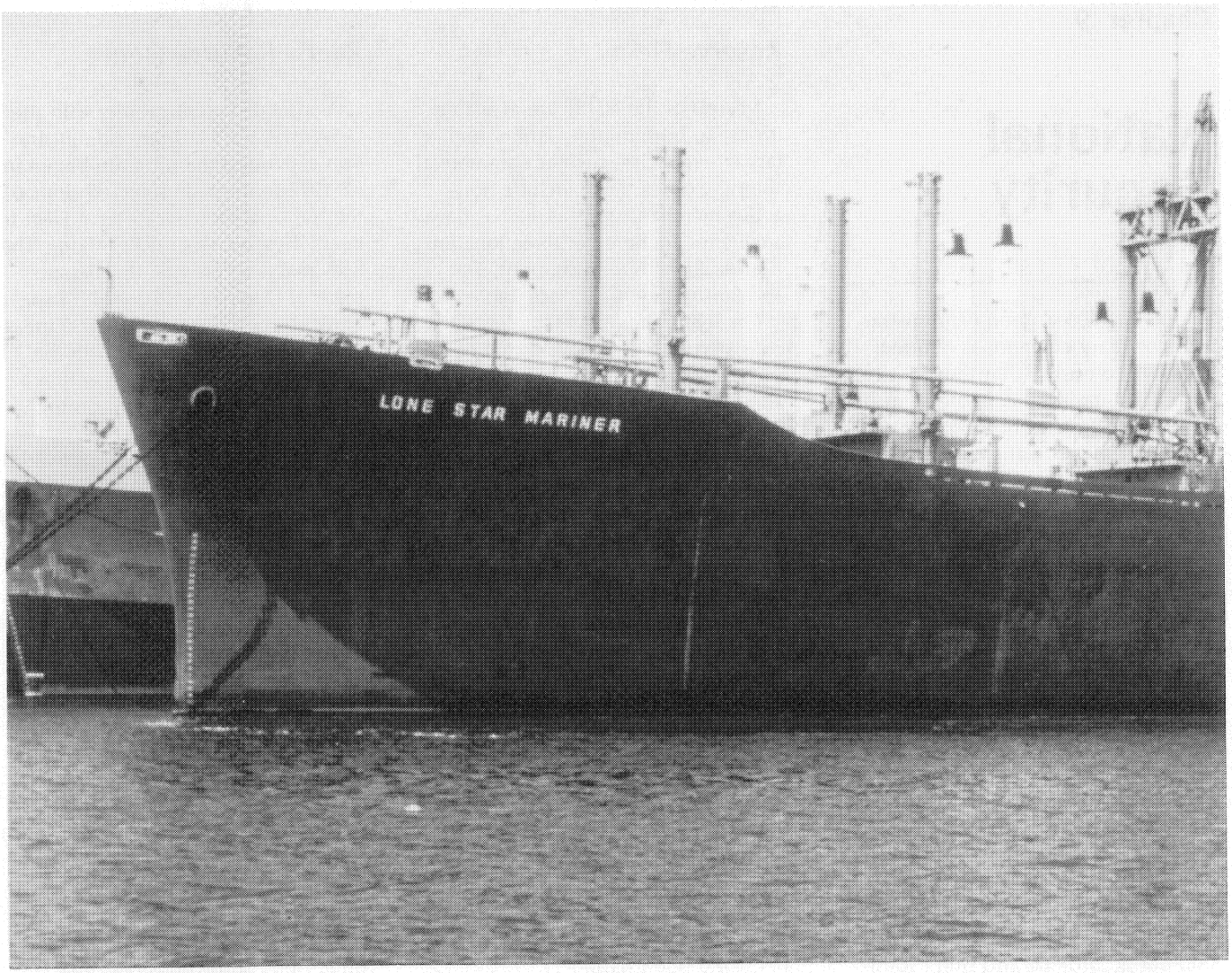
As part of a joint project with the U.S. Navy, the Maritime Administration expanded the program begun in FY 1977 to upgrade selected ships of the National Defense Reserve Fleet to Ready Reserve Fleet (RRF) status. The RRF goal is to provide the Department of Defense with a sealift capability of approximately 340,000 measurement tons in FY 1981, with the ships capable of activation within 5 to 10 days for deployment during national emergencies.

To ensure this capability, activation tests are carried out in the RRF periodically with no advance warning. The first of these was conducted successfully in FY 1978. At the direction of the Military Sealift Command, the RRF vessel SS PRIDE was activated and completed 24-hour sea trials in less than 10 days.

During the year three "SEATRAIN" design ships were assigned to ship repair facilities for upgrading to RRF standards. In addition, three Mariner class ships were made available through the trade-in and build provisions of the Merchant Marine Act of 1936, as amended. One was placed directly in the James River Reserve Fleet where it will be joined by the others after shipyard processing.

The GLOMAR EXPLORER

On June 1, 1978, MarAd redelivered the GLOMAR EXPLORER to the U.S. Navy, which chartered the vessel to a private contractor for a deep-sea mining research project. The GLOMAR EXPLORER had been in the Agency's Suisun Bay NDRF since October 1, 1976.



LONE STAR MARINER, moored in James River (Va.) as part of National Defense Reserve Fleet, in FY 1978 became first vessel of its class to be added to Ready Reserve Fleet (RRF). Ships of RRF are kept in readiness for activation within 10 days.

The SS JEREMIAH O'BRIEN

Under the co-sponsorship of MarAd's Western Region and a citizens' group, the last World War II Liberty ship that remains as originally designed, the SS JEREMIAH O'BRIEN, was placed on the National Register as an historical object July 7, 1978. A $10,000 grant from the National Trust for Historic Preservation has been received and will be used to assist in the restoration of the ship, now a part of the NDRF.

When sufficient funds have been received by the National Liberty Ship Memorial, Inc., the JEREMIAH O'BRIEN will be transferred from the Suisun Bay Reserve Fleet, completely restored, and moored at Fort Mason in San Francisco Harbor as part of the Golden Gate National Recreation Area.

Fish Reef Program

During FY 1978 three obsolete Liberty ships were approved for intentional sinking under carefully controlled conditions as part of an artificial fish reef program designed to benefit coastal marine ecology.

This MarAd program, established by Public Law 92–402, now is effectively concluded; no more Liberty ships are available in the Reserve Fleet.

Over the past 8 years, 42 vessels were designated for this purpose. Allocations by States included South Carolina and California, 1 each; Georgia 2; North Carolina 4; Alabama and Mississippi, 5 each; Florida and Virginia, 6 each; and Texas 12.

Ship Sales

Under its authority to dispose of NDRF vessels, the Maritime Administration sold 22 Government-owned ships for a total of $2.9 million for scrap or nontransportation purposes during the fiscal year. Twenty vessels were sold from NDRF anchorages for $2,613,783 and the other two from nonfleet locations for $335,000.

Sale of 2,291 vessels for scrap or nontransportation purposes from 1958 through 1978 has brought a total return to the Government of $197.2 million.

Material Control

Marine equipment valued at $875,377 was on loan to shipyards, ship operators, and other marine industries at the end of the year. Warehouse inventories were valued at $4.4 million.

War-Risk Insurance

MarAd's war-risk insurance program, authorized by Title XII of the Merchant Marine Act of 1936, as amended, insures operators and merchant seamen against losses caused by hostile actions and certain marine perils under circumstances for which commercial insurance is not available on fair and reasonable terms.

As of September 30, 1978, outstanding binders to cover shipowners during the 30-day period after termination of their commercial war-risk insurance included 653 for war-risk hull insurance, 649 for war-risk protection and indemnity insurance, and 557 for war-risk insurance on crew life and personal effects. Approximately 2,200 LASH or similar type barges are covered through binders issued for groups of these vessels which have similar characteristics.

Proposed regulations implementing the revised criteria for considering United States citizen-owned or citizen-controlled foreign-flag vessels inserted in the Merchant Marine Act by Public Law 94–523 were published and public comments received during this reporting period. The final regulations were formulated after review of the comments and prepared for subsequent publication.

Public Law 94–523 requires MarAd to consider the characteristics, employment, and general management of a vessel in determining whether to grant insurance to a foreign-flag vessel. All vessels enrolled in the program were made subject to any vessel-location reporting system that might be established by regulation. The existing United States Merchant Vessel Locator Filing System (USMER) is being used for this purpose. Other provisions of the law authorize the assessment of annual binder fees calculated to recover the expenses of processing applications, employment of underwriting agents, and appointment of experts, as well as providing that containers, loaded or empty, aboard a vessel are considered to be part of cargo.

From the start of the binder program in 1952 through September 30, 1978, binder fees totaled $1.29 million, while expenses totaled $1.35 million. Of the latter, $503,114 was paid as fees and expenses of the underwriting agent employed by MarAd under contract to process the binders.

At the request of the U.S. Navy, war-risk insurance is provided without premium charge, but on a reimbursable basis, for losses incurred as authorized under Section 1205 of the act. As of September 30, 1978, second seamen's war-risk insurance was provided for the crews of 4 Government-owned tankers operated for the account of the Military Sealift Command (MSC) and crews of 14 privately owned U.S.-flag vessels under bareboat charter to MSC. Net premium savings to the Navy under these two programs from their inceptions in 1954 and 1964, respectively, to September 30, 1978, are estimated at $1.4 million, after deducting claims payments of $110,740.

Another type of war-risk insurance, covering builders' risks in the prelaunching construction period, was written on 164 vessels from inception of the program in 1953 through September 30, 1978, with a premium income of $3.5 million; 53 binders were issued for war-risk builder's risk insurance for the postlaunching construction period from October 1962 through FY 1978. One of the latter was outstanding at the end of the year.

MarAd also administers a standby war-risk cargo insurance program. It is implemented when the Assistant Secretary of Commerce for Maritime Affairs determines that insurance adequate for the needs of the U.S. waterborne commerce cannot be obtained from commercial sources at reasonable terms and conditions. As of September 30, 1978, 38 commercial underwriting agents were under standby contracts.

Table 21: NATIONAL DEFENSE RESERVE FLEET—SEPTEMBER 30, 1978

Fleets	Retention [1]	Scrap Candidates	Special Programs	Total
James River, Va.	85	15	40	140
Beaumont, Tex.	39	2	7	48
Suisun Bay, Calif.	87	7	24	118
Total	**211**	**24**	**71**	**306[2]**

[1] Vessels maintained for emergency activation under the fleet preservation program.
[2] Excludes one ship sold but not delivered, three Ready Reserve Fleet ships, and three moored at Suisun Bay, Calif., on behalf of the U.S. District Court, Northern District of California.

Under authority of Section 1208(a) of the act, money in the war-risk insurance revolving fund may be invested in U.S. securities or in securities on which the United States guarantees principal and interest. From 1962, when the initial investment was made, through September 30, 1978, earned interest totaled $4.2 million.

Marine Insurance

The Maritime Administration continued to act as the insuring agent for Government-owned ships during the fiscal year. On September 30, 1978, there were 11 marine protection and indemnity claims outstanding, 5 of which were in litigation. Total settlement value of all cases was estimated to be $2.3 million. Three of the claims are pending from the Vietnam era and have an estimated reimbursement value from commercial underwriters of $258,000. The balance of $2,042,000 is for the account of the United States and includes one serious injury sustained by a member of the crew of the SS WASHINGTON during Operation Reforger '77 when the Ready Reserve Fleet vessel was operated on a self-insured basis under General Agency Agreement.

MarAd assures that contract requirements are met on all insurance placed in commercial markets by mortgagors of vessels on which the Government holds or insures mortgages, by charterers of Government-owned vessels, and by subsidized operators.

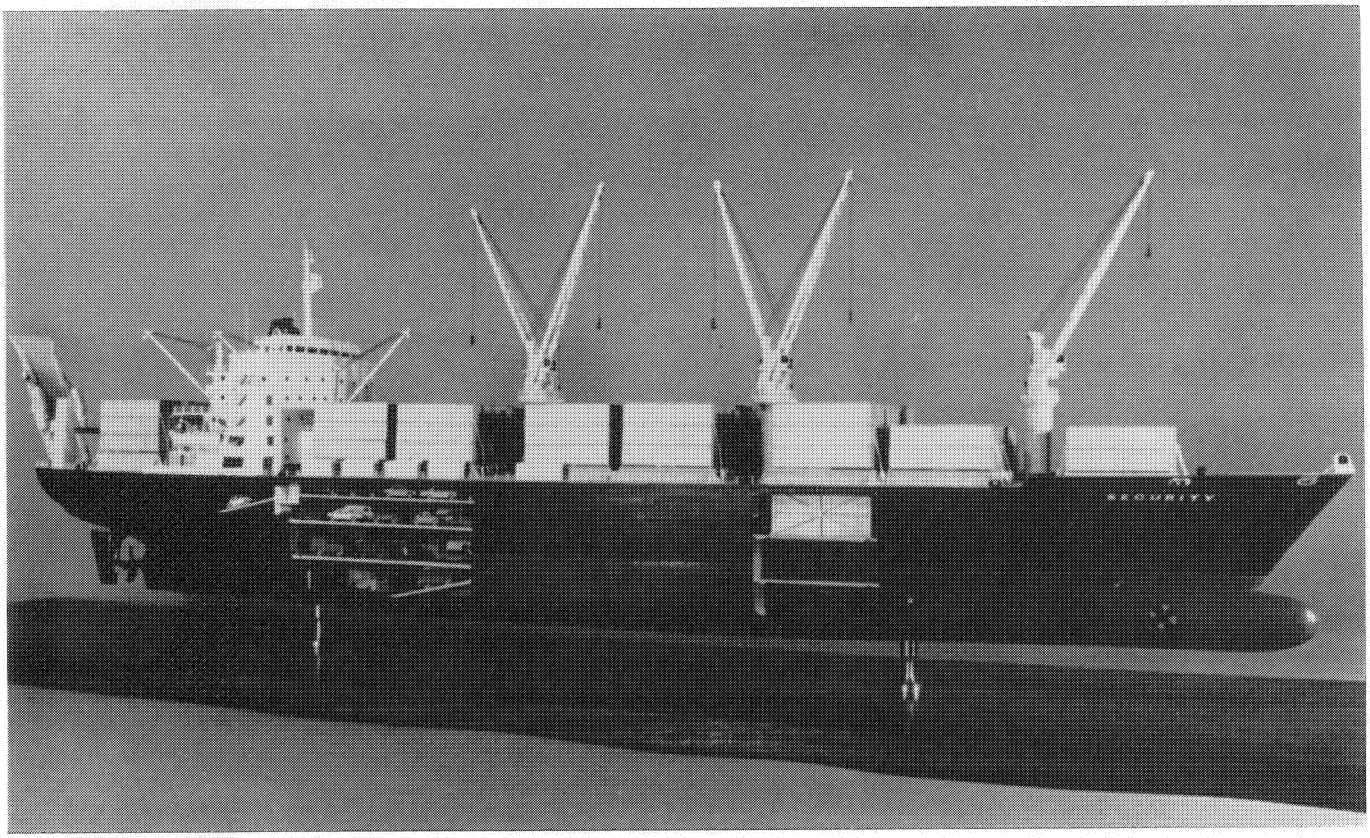
Insurance amounts approved during FY 1978 are shown in Table 23.

Emergency Readiness

NATO Ships

Arrangements were completed during FY 1978 for use of European NATO ships to supplement the U.S. merchant fleet in support of military reinforcement operations, and plans were prepared to test the arrangements during FY 1979. This action significantly improves the capability to move U.S. reinforcements on short notice.

Regular meetings were established to inform U.S. shipping industry representatives of the National Shipping Authority's (NSA's) wartime plans, under which ship operating companies would function as general agents of NSA. Security clearances were granted to executives of the companies to permit definitive discussion of national defense plans.



European NATO shipping authorities also were advised of U.S. reinforcement planning to the extent necessary.

Legislative Changes

With termination of the National Emergencies Act of September 13, 1978, the continuing national emergency posture under which the National Defense Reserve Fleet could have been activated without further Presidential findings of necessity also ended. The underlying legislative authorities to requisition ships (as contained in Section 902 of the Merchant Marine Act of 1936, as amended) and to activate the National Defense Reserve Fleet (as contained in Section 11 of the Merchant Ship Sales Act of 1946) were not affected, however. The effect of termination of the National Emergencies Act on emergency shipping operations is that the NDRF may not now be activated without the proclamation of a National Emergency by the President or a Presidential proclamation that the security of the national defense makes it advisable to requisition ships and other watercraft.

Scale model of liner vessel, aptly named SECURITY, illustrates multipurpose ship design which could become standard prototype for future development. Preliminary design combines general, container, and RO/RO cargo carrying and handling flexibility; grew out of industry study as part of MarAd's continuing effort to maintain mobilization base in event of national emergency. (See Ship Design and Engineering section of Chapter 1 for details.)

The MarAd Appropriation Authorization Act of FY 1979 (P.L. 95–298) contained a new provision barring payment of operating-differential subsidy and construction-differential subsidy in FY 1979 for ships not enrolled in a Sealift Readiness Program approved by the Secretary of Defense. Action was taken to implement such a program before the end of FY 1978.

The Attorney General certified continuation of the Voluntary Tanker Plan until 1980, under the provisions of Section 708 of the Defense Production Act of 1950, as amended. The plan provides for cooperative action of owners and operators—rather than requisitioning—to supply tankers to meet military needs. Subsequent renewals of the plan will depend upon publication by the General Services Administration of regulations implementing the revised Section 708.

In December 1977 MarAd published a study of national defense and security requirements for the U.S.-flag merchant marine entitled *An Adequate and Well-Balanced Merchant Fleet*. The study, which will be updated annually, concludes that additional roll-on/roll-off capacity is desirable to provide greater flexibility and responsiveness for military force deployments and that additional dry-bulk and tanker capacity is needed to provide U.S.-flag shipping to carry minimum essential wartime bulk imports.

MarAd/DOD Activities

In September 1978 the Department of the Navy stated its policy for Navy/merchant ship communications. The Navy's long-term objective is satellite communications for all ships. Its intermediate objective is high-frequency radioteletype with effective alertment and automatic error correction (SITOR/SELCALL).

A naval control of shipping exercise in the Pacific was the principal defense exercise incorporating merchant shipping during FY 1978. It identified the need for further planning for civil direction of shipping operations in conjunction with naval operations to respond to operating conditions peculiar to the Pacific.

The Western Region's participation in the ongoing Running Mate Program continued in FY 1978. This exchange of officers between the merchant marine and U.S. Navy began in FY 1976.

Industrial Preparedness

In cooperation with the Department of Defense, MarAd continued to revitalize the Industrial Preparedness Planning (IPP) program, the primary objective of which is to ensure that the marine industrial production base would be capable of satisfying marine material and equipment requirements in the event of a national emergency. During FY 1978 planning included the subcontractor and vendor levels. As of September 30, 1978, a total of 2,060 IPP agreements had been negotiated with approximately 370 marine-related firms.

One industrial sector study, on marine-oriented foundries, was completed, and others—on main propulsion systems, marine forgings, reduction gears, and marine propulsion shafting—were initiated.

During the year MarAd also began participating in activities of the Interagency Industrial Evaluation Board. The Agency conducted analyses of certain critical marine components, utilizing IPP data. Machinery availability studies also were developed in support of an austere "mobilization ship" design program.

Table 22: NATIONAL DEFENSE RESERVE FLEET 1945-1978

Fiscal Year	Ships	Fiscal Year	Ships
1945	5	1962	1862
1946	1421	1963	1819
1947	1204	1964	1739
1948	1675	1965	1594
1949	1934	1966	1327
1950	2277	1967	1152
1951	1767	1968	1062
1952	1853	1969	1017
1953	1932	1970	1027
1954	2067	1971	860
1955	2068	1972	673
1956	2061	1973	541
1957	1889	1974	487
1958	2074	1975	419
1959	2060	1976	348
1960	2000	1977	333
1961	1923	1978	306

Table 23: MARINE AND WAR-RISK INSURANCE APPROVED IN FY 1978

		Percentage	
Kind of Insurance	Total Amount	American	Foreign
Marine Hull	$5,700,000,000	59	41
Marine Protection and Indemnity	[1]	—	—
War-Risk Hull	5,477,000,000	55	45
War-Risk Protection and Indemnity	5,477,000,000	55	45

[1] Effective February 20, 1978, protection and indemnity mutual clubs in the British market offered unlimited liability coverage, thereby making it impossible to arrive at percentage figures for American and foreign participation.

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Chapter 10

International Activities

Of continuing international significance in fiscal year 1978 were bilateral talks related to the U.S.-U.S.S.R. Maritime Agreement and with Argentina, Brazil, and Poland; MarAd participation in international maritime conferences and organizations, including those concerned with labor, safety, and environmental policy; and the work of the Agency's Foreign Maritime Representatives (FMRs).

U.S.-U.S.S.R. Maritime Agreement

The designated representatives of the Governments of the United States and the Soviet Union met twice during the year in a continuing series of consultations to ensure the effective implementation of the December 29, 1975, U.S.-U.S.S.R. Maritime Agreement.

At sessions held in October 1977 the designated representatives agreed that the U.S. Gulf-Soviet Black Sea charter rate would be $16 per long ton for fixtures of U.S.-flag vessels for the carriage of grain to the Soviet Union during calendar year 1978. They also agreed on a new method for determining allowed discharge time during periods of adverse weather.

French-built subway car, first of 100 to be delivered to Metropolitan Atlanta Rapid Transit Authority, is unloaded from barge of SS TILLIE LYKES. Lykes Bros. barge, container, and heavy-lift SEABEE vessel (background) is nearly fully loaded for next outbound voyage.

The designated representatives determined that in the first half of calendar year 1977 the total volume of raw or processed agricultural commodities shipped from the United States to the Soviet Union was 4,490,400 metric tons. U.S.-flag vessels carried 13 percent, and third-flag vessels, 46 percent.

The designated representatives agreed that at the end of 1976 an imbalance of $1,723,430 existed in favor of the United States in the accountable liner share and that this amount would be excluded from Soviet-flag carriage in determining parity for 1977.

These agreements were confirmed in memoranda signed October 14, 1977.

The U.S. and U.S.S.R. representatives met again in July 1978 and concluded those sessions with the signing of two memoranda on July 13.

They determined that grain cargoes in 1977 totaled 7,415,600 metric tons, of which U.S.-flag vessels carried 29 percent, Soviet-flag vessels, 15 percent and third-flag vessels, 56 percent.

The designated representatives also agreed that U.S.-flag vessels would be offered 117,944 tons of liquid-bulk cargoes and 214,537 tons of dry-bulk cargoes as compensation for imbalances in the previous accounting period. These cargoes would be in addition to the normal U.S. share for 1978.

The designated representatives determined that the mutually acceptable rate for the carriage of petroleum coke to the Soviet Far East for the period July 13-December 31, 1978, would be $21 per long ton.

These agreements were confirmed in a Memorandum on Bulk Cargoes.

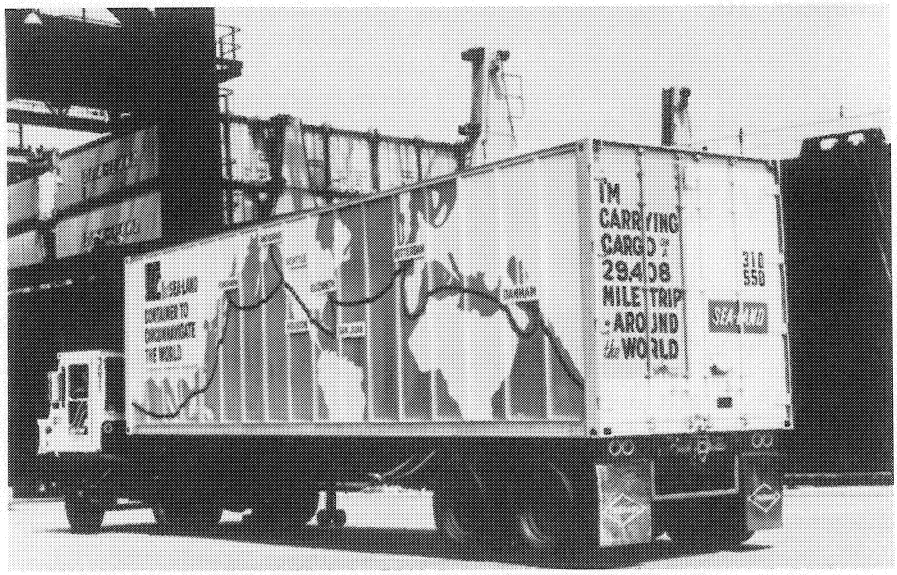
In the second document, a Memorandum Concerning Liner Cargo Movements, the designated representatives confirmed that on December 31, 1977, an imbalance of $113,858 in the accountable liner shares existed in favor of vessels of U.S. registry. On the basis of final information on 1977 carriages, the figure was later revised to show an imbalance of $161,697 in favor of U.S.-flag vessels. Accommodations were made to achieve parity in the first quarter of 1978.

On September 18, 1978, the designated representatives signed an Addendum to the July 13, 1977, Memorandum on Bulk Cargoes, in which they established an $18.25 per long ton charter rate for the fixture of U.S.-flag vessels for the carriage of grain in 1979.

The addendum also amended the March 25, 1977, bulk memorandum to provide that vessel owners would not be responsible for cargo insurance premiums, required by a vessel's age, beyond amounts assessed in the U.S. insurance market. Previously, the Soviet charterers had exclusively applied London scale rates—approximately double U.S. penalty cargo premiums—to overage insurance of U.S.-flag vessels in the bilateral grain trade.

In addition to action taken by the designated representatives, U.S. and Soviet delegations met in January 1978 to discuss the difficulties of U.S. underwriters in obtaining an equitable and substantial share of marine cargo insurance for bilateral trade. In Government and commercial meetings held over the previous 4 years, the Soviets failed to propose or accept any resolution of the problem. The American Institute of Marine Underwriters (AIMU) subsequently filed a complaint with the U.S. Special Trade Representative (STR) pursuant to the Trade Act of 1974. AIMU claimed that U.S. marine cargo underwriters had been excluded from writing basic insurance on U.S.-Soviet cargoes as a result of Soviet commer-

Sea-Land's first container to circle globe arrives at company's Elizabeth, N.J., terminal for loading aboard Europe-bound SEA-LAND RESOURCE. On initial leg of 29,408-mile around-the-world journey (to Rotterdam; see map), container's cargo included first VW Rabbit produced in U.S.—destined for Volkswagen's international headquarters museum at Wolfsburg, West Germany.



cial practices. On the basis of a review by the STR, the President determined that Soviet practices did, in fact, constitute an unreasonable burden and restriction on U.S. commerce. The Soviets subsequently requested a meeting with MarAd officials with the intent to resolve the issue, and such a meeting was scheduled for October 1978.

Other Bilateral Talks

U.S. and Brazilian maritime delegations met in Washington, November 14–17, 1977, to discuss cargo carriage statistics in the U.S.-Brazil trades, wayport charges, and an agreement on maritime transport proposed by the Government of Brazil. Letters were exchanged between the heads of the delegations extending the Equal Access Agreement and setting forth the procedures for its implementation.

Assistant Secretary Blackwell led a MarAd delegation to Argentina and Brazil March 27-April 6, 1978. The Argentine talks resulted in the signing of a memorandum whereby each country recognized the interest of the other in carrying a substantial portion of their bilateral trade and agreed to implement these intentions through commercial agreements between their respective national-flag carriers.

Discussions in Brazil centered on the entrance of Sea-Land Service, Inc., into the U.S.-Brazil trades. The Brazilian government had issued a decree which would allow into Brazil only those containers that met the requirements established by the International Standardization Organization, effectively precluding Sea-Land's use of its 35-foot containers in the trade. Another issue which involved Sea-Land was the Brazilian Superintendency of the Merchant Marine resolution that stated as a general rule that Brazilian trade would be carried by the same vessel from the port of origin to the port of destination. This resolution, in effect, does not allow the transshipment of cargo.

In May 1978 a MarAd delegation led by Deputy Assistant Secretary Nemirow visited Poland. MarAd technical personnel were included to assist in determining the appropriateness of maritime technology transfer and potential areas for cooperative maritime research efforts between Poland and the United States. Members of the delegation also discussed port entry requirements with Polish officials.

International Conferences

MarAd representatives participated in 43 regularly scheduled international conferences and attended numerous *ad hoc* discussions on various international shipping matters during FY 1978.

The Intergovernmental Maritime Consultative Organization (IMCO), the Organization for Economic Co-operation and Development (OECD), and the U.N. Conference on Trade and Development (UNCTAD)—all specialized agencies of the United Nations—convene regularly to discuss various aspects of maritime transport which are also important to the U.S. merchant fleet.

MarAd representatives attended IMCO-sponsored conferences dealing with maritime safety, stability and load lines, pollution prevention, standards of training and watchkeeping, incineration at sea, and maritime communications satellites.

President Carter's initiative on the requirement for collision-avoidance aids was a major topic of discussion at the Joint Meeting of IMCO's Maritime Safety Committee and Marine Environment Protection Committee (MEPC) held in London from October 7 to 22, 1977.

MarAd was a member of the U.S. delegation to the meeting of IMCO's MEPC held in London from December 5 to 9, 1977. Of primary interest to MarAd were items concerning the provision of reception facilities; a comprehensive antipollution manual; oily-water separators, filters and related equipment; and tanker safety and pollution prevention. The Agency's chief of environmental activities served as an expert in the conduct of a 6-month IMCO study on reception facilities in oil loading ports in the Mediterranean.

MarAd also participated in two meetings of the Maritime Safety Committee, held in London from April 14 to 22, 1978, and from September 25 to 29, 1978. The April meeting was the first of this committee open to all members of IMCO and was dominated by discussions and proposals involving the AMOCO CADIZ tanker disaster. The committee also discussed search and rescue, lifesaving appliances, fire protection, containers and cargoes, ship design and equipment, safety of navigation, marine training, radio communications, bulk chemicals, carriage of dangerous goods, substandard ships, subdivision, stability, and load lines.

IMCO sponsored a meeting of the Joint *Ad Hoc* Group on Incineration at Sea held in London from June 21 to 23, 1978. This meeting dealt with the incineration of organic wastes on board special vessels at sea, and the construction of those vessels.

MarAd also was represented at the International Conference on Tanker Safety and Pollution Prevention held in London from February 3 to 18, 1978. The conference was considered highly successful in advancing the U.S. initiative on tanker safety and pollution prevention proposed by President Carter in his March 17, 1977, message to Congress. The conference also dealt with protocols to the 1974 Safety of Life at Sea Convention and the 1973 International Convention for the Prevention of Marine Pollution.

The International Conference on Training and Certification of Seafarers, sponsored by IMCO, was held in London from June 30 to July 11, 1978. This conference was the culmination of 7 years of work by an IMCO Subcommittee to develop an International Convention of Standards of Training, Certification, and Watchkeeping for Seafarers. This Convention is the first proposed international treaty dealing with operating personnel aboard ship. It establishes qualification and proficiency standards for key operating personnel and defines requirements for the maintenance of proper shipboard watches for the safety of ship operations. The Convention also commits the stronger maritime states to assist in the training of merchant seafarers of the lesser developed countries.

During FY 1978 the Maritime Administration also took part in meetings of the Maritime Transport Committee of the OECD. These sessions included discussions of assistance to shipping and shipbuilding, flags of convenience, and Eastern bloc shipping.

MarAd also was represented at the meeting of UNCTAD's *Ad Hoc* Intergovernmental Working Group on the Genuine Link Between Vessel and Flag of Registry held in Geneva from February 6 to 10, 1978.

Additionally, MarAd representatives attended European Community meetings on transportation and Soviet shipping; plenary sessions of the NATO Planning Board for Ocean Shipping and NATO working groups on freight rates, shipping war losses, plans review, and military sealifts; meetings of the International Standardization Organization; a symposium on the Aspects of Navigability of Constraint Waterways, Including Harbor Entrances; and international conferences on gas turbines, containers, marine simulators, and oil pollution prevention.

During the fiscal year there also were two annual meetings of the American Association of Port Authorities attended by MarAd representatives.

The first two meetings between representatives of the Consultative Shipping Group (CSG) and the United States took place in FY 1978. (The CSG is composed of 12 major West European maritime countries and Japan.) The first meeting was held in Washington from May 30 to June 1. Delegates reviewed relations in the shipping field between CSG governments and the United States, the laws and policies affecting shipping of the countries represented, and the jurisdictional and other difficulties resulting from various differences. Various means of consultation which might ameliorate this situation were discussed. The second meeting was held in London from September 12 to 15. This was a working group meeting at which delegates obtained a more detailed and clearer understanding of each other's laws, policies, practices, and enforcement procedures in the area of liner shipping.

Foreign Maritime Representatives

MarAd's five regional Foreign Maritime Representatives (FMRs) continued to collect foreign cost data, monitor foreign and international maritime developments, and provide support to the Agency's market development program via extensive contacts with foreign and American manufacturers and exporters and importers. The FMRs are located in Tokyo, London, Rio de Janeiro, Brussels, and Athens.

AMERICA
AMERICAN MERCHANT

Chapter 11

Administration

Maritime Subsidy Board

The Maritime Subsidy Board (MSB), by delegation from the Secretary of Commerce, awards, amends, and terminates subsidy contracts for the construction and operation of vessels in the foreign commerce of the United States. Its functions are implemented through fact-finding investigations, compilation of domestic and foreign trade statistics and cost data, and public hearings. MSB decisions, opinions, orders, rulings, and reports are final unless the Secretary of Commerce undertakes review of its actions.

The Assistant Secretary of Commerce for Maritime Affairs, as ex officio Maritime Administrator, is Board Chairman. Other permanent members are the Deputy Assistant Secretary and the Agency's General Counsel. The Secretary of the Maritime Administration (MarAd) acts as an alternate member in the absence of any one of the three permanent members.

Robert J. Blackwell (left), Assistant Secretary of Commerce for Maritime Affairs, awards 1978 American Merchant Marine Seamanship Trophy to Capt. Paul Holland, Elmore, Va., commercial fisherman. Blackwell headed Select Committee which cited Holland for distinguished seamanship in rescue of 14 passengers and crew members from capsized charter fishing boat during Chesapeake Bay storm June 6, 1977. Trophy was presented in Washington office of Congressman Paul Trible, member, House Merchant Marine and Fisheries Committee, who represents district in which winner resides.

In FY 1978 the Board met 47 times. It considered and acted on 306 items and issued 29 formal opinions, rulings, and orders. It also published 86 notices in the *Federal Register* on required statutory hearings and the development and adoption of rules and regulations in the implementation of the Merchant Marine Act of 1936, as amended, and other statutes entrusted to it.

Three Board decisions found that Section 605(c) of the act was no bar to requests by operators for 20-year operating-differential subsidy (ODS) contracts on most of their services. Section 605(c) bars award of a subsidy contract for existing services if undue advantage or prejudice would result as between U.S.-flag citizens unless, after hearing, it is determined that such contract is necessary to provide adequate U.S.-flag service. The section bars a subsidy contract award for additional services unless it is determined, after hearing, that U.S.-flag service is inadequate and that it would be within the accomplishment of the purposes and policy of the act to operate such vessels.

In decisions served on October 21 and November 14, 1977 (Docket No. S–417), the Board found Section 605(c) did not bar requested subsidized vessel operations by American President Lines, Ltd. (APL) except for operation inbound on Trade Route 10 (between the U.S. Atlantic and Mediterranean ports).

In a decision served December 19, 1977 (Docket No. S–465), the Board found, with respect to application by Prudential Lines, Inc., for renewal of subsidy on its services: (1) that the standing of intervenors was limited to competitive U.S.-flag services on trade routes where more than incidental service was provided; (2) that Section 605(c) did not bar subsidized services (at least in major part) requested by Prudential for which intervenors had standing, except to Spain north of Portugal from U.S. North Atlantic ports and to Florida from Mediterranean ports; and (3) that future subsidy application for transfer privileges but not interchange (substitution) shall be subject to Section 605(c) scrutiny.

In a decision served September 5, 1978 (Docket Nos. S–421 and S–455), the Board found, with respect to applications by Waterman Steamship Corp., that Section 605(c) did not bar its requested subsidized services.

Two other FY 1978 rulings attracted widespread interest:

On December 8, 1977 (Docket No. A–121), the Board decided, with respect to the request of American President Lines, Ltd., to renew its 20-year ODS agreement, that, if the application were sufficiently modified, some—but not full—subsidy authorized under the Act would place APL's vessels on a parity with vessels of foreign competitors and could be reasonably calculated to carry out effectively the purposes and policy of the Act.

The other ruling, served January 6, 1978, satisfied an order of the U.S. District Court for the District of Columbia in *Shell Oil Company v. Kreps and Alaska Bulk Carriers, Inc. and Trinidad Corporation v. Kreps* (Docket CA Nos. 77–1645 and 77–1647). The Court required the Board and Assistant Secretary for Maritime Affairs to consider the competitive effects upon other U.S.-flag operators of permitting Polk Tanker Corp. to repay $27.2 million in construction-differential subsidy (CDS) by means of a 20-year interest-bearing promissory note, secured by a third preferred ship mortgage on the STUYVESANT, and thereby remove all restrictions on operation of the tanker in domestic trades, particularly the Alaskan oil trade. The Board and the Assistant Secretary (Docket No. A–124) decided that the competitive effects on competition in the Alaskan oil trade were none or minimal and that the effects on competition of the terms of Polk's repayment were none or minimal. The case was pending decision by the Court of Appeals at the end of this reporting period.

Administrative Law Proceedings

MarAd's Administrative Law Judges (ALJs), in conjunction with the Agency's executive staff, conduct public hearings necessitated by merchant marine and shipping statutes and then prepare initial or recommended decisions. Cases are referred to ALJs by the Assistant Secretary for Maritime Affairs or the MSB.

At the beginning of the fiscal year 26 proceedings were pending before the Administrative Law Judges. Of these, 16 involved ODS matters and 10 concerned appeals of final decisions of contracting officers in disputes between ship owners or shipyards and MarAd, including the MSB.

In the course of the year, 10 more ODS cases and 8 more contract appeal cases were referred for hearing. Of the total docket, 7 initial decisions were issued and hearings were completed in another 11 cases. Seven proceedings were either settled, withdrawn, or dismissed, while four proceedings were returned to the MSB for final decision. Thirty-three cases were pending before the ALJs at the close of the fiscal year.

Legal Services, Legislation, and Litigation

The General Counsel of the Maritime Administration, in addition to serving on the Maritime Subsidy Board (as noted above), provides legal services to the Assistant Secretary, the Board, and to the Agency's various offices and divisions. A substantial portion of this effort in FY 1978 related to maritime aid programs, other programmatic activities, domestic and international shipping matters, and rulemaking, legislation, and litigation.

A number of special projects were undertaken to simplify, increase the efficiency, and reduce the cost of processing legal documents.

Two of these projects sought to reduce costs to Title XI applicants and ease the documentation involved in that program. One of the projects entailed the development of printed standard forms. The others is intended to develop and provide, through the MarAd regional offices, a special package of ship financing documents for companies with no prior Title XI experience. This procedure for processing applications would be available in the field for transactions of $5 million or less, in which vessels are delivered on or prior to the date of the Title XI financing.

In this reporting period also, the joint MarAd-Navy effort to establish a Ready Reserve Fleet (see Chapter 9) required extensive legal review of contract forms and regulations applicable to the National Defense Reserve Fleet. Evaluation and study of contract forms continued as the year closed.

The Agency's principal legislative efforts in FY 1978 included staff work on a number of bills amending various safety and environmental protection standards, notably (1) the Port and Tanker Safety Act of 1978, (2) a measure providing for protection of the marine environment from accidental and operational pollution resulting from the waterborne transportation of oil, and (3) a bill providing a comprehensive system of liability and compensation for discharges of oil and other substances.

Other major maritime legislation involved waterway user charges, amendments to the obligational authority under Title XI of the Merchant Marine Act of 1936, and regulation of common carriers in the United States' waterborne foreign commerce.

In addition, the legal staff provided legislative research and planning in an effort to insure that the statutory framework of the merchant marine program would continue to meet the needs of the industry in a changing business environment.

The Agency developed and established an in-house procedure to carry out the prescriptions in Executive Order 12044, "Improving Government Regulations."

Legal assistance and advice were provided within the Agency, and MarAd's ongoing support in litigation and advisory assistance to the Department of Justice continued on actions ranging from personnel and Freedom of Information matters to complex financial and contractual matters.

Internal Management Initiatives

During FY 1978 MarAd conducted a comprehensive review of the methods and procedures for preserving ships in the National Defense Reserve Fleet (NDRF). As a result, improved preservation work systems will be installed during FY 1979. Combined with the downgrading of certain Navy ships in the NDRF, these actions allowed 22 positions to be reprogrammed to meet new or increased workloads.

Efforts continued during FY 1978 to reduce reporting requirements placed on the public. With the elimination of two recurring reports, and major modification of another report, a savings of approximately 67,000 hours annually was achieved, accounting for about 58 percent of the total Agency reporting requirement.

As a result of efforts to improve the utilization of word processing equipment, 20 percent of the automatic typewriters within the Agency have been eliminated, at a significant cost savings, and provisions have been made for the remaining equipment to be available for use by several offices.

Audits

Two internal audit reports were submitted to MarAd by the U.S. Department of Commerce's Office of Audit—the Audit of Selected Property Management Activities and the Audit of Policies Used in Obligating and Deobligating Funds for Construction-Differential Subsidy.

The General Accounting Office submitted audit reports on Navigation Planning, the Satellite Communications Program, Cargo Preference Programs for Government-Financed Ocean Shipments, and Development of a Long-Range Program Plan for Replacements and Additions to the Merchant Fleet.

With minor exceptions, MarAd agreed with the recommendations in these audit reports and is currently implementing them.

Financial Analysis

With the completion of MarAd's Financial Information and Retrieval System (FIRST), the Agency acquired an important automatic data processing (ADP) tool for the analysis of financial trends in the U.S.-flag liner industry. One of the objectives of the system is to provide industrywide statistics to the liner companies for use in gauging their performance against industry norms.

Work was underway at year's end to expand the FIRST concept to the nonliner segments of the industry. A data base containing financial information related to deepdraft dry- and liquid-bulk carriers, barge and inland waterway carriers, and the drill rig vessel and supply boat industries is being developed within an ADP system called FIRST-XI. FIRST-XI will be used to generate industry profiles, as well as to refine the financial evaluation of new Title XI applications.

Management Information

The Maritime Administration continued to expand the use of automation in the management and support of its programs in this reporting period. More automatic data processing systems were converted to computer-assisted entry and maintenance of automated records through terminals. Nearly 60 computer terminals now are being used actively by headquarters organizations and regional offices for a variety of automated tasks.

As a result of recent purchases, the Agency's computer system is now almost totally Government owned. This change to Government ownership (versus leasing) will save the Government more than $2.5 million over a period of 5 years.

Development of a new automated trade system—MATS—enabled the Maritime Administration to relieve the shipping industry of an onerous and costly reporting burden. Previously, specified information about all inbound and outbound voyages had to be furnished by operators or agents using Vessel Utilization and Performance forms. This reporting requirement was eliminated through the creation of an ADP system utilizing Bureau of the Census-supplied data to compute the Foreign Trade Competition portion of the subsidy process.

An automated Subsidy Rate Calculation System, also implemented in FY 1978, replaced manual—and therefore slower—processes formerly used in reviewing ODS contract proposals.

Another new ADP system, the National Cargo Shipping Analysis System, significantly enhances the monitoring of shipments covered by Federal cargo preference regulations. Included are all programs associated with funds of U.S. civilian agencies and the Export-Import Bank and several programs of the Department of Defense. The National Cargo Shipping Analysis System will provide the means of assessing whether cargo preference regulations are being applied to Government-impelled cargoes. These require that at least 50 percent of the shipments be carried in U.S.-flag vessels.

Also in FY 1978, MarAd's automated Domestic Trade System was enhanced considerably, permitting the expedited delivery to industry and other Government agencies of information on inland waterway cargo movements which had been unavailable previously.

The Department of Commerce selected MarAd's Employee Information System as the standard personnel system for all departmental agencies.

Personnel

Employment

Total employment in the Agency increased from 1,451 to 1,464 in FY 1978, an increase of less than 1 percent.

The number of minority employees increased 15 percent and the number of female employees increased 14 percent. Minority employees represented 28 percent of the total workforce, occupied 12 percent of the supervisory positions, and held 9 percent of the GS-12 and above positions. The number of female employees increased from 412 to 471. Women occupied 8 percent of the supervisory positions and 9 percent of the GS-12 and above positions.

Training

During the fiscal year, MarAd employees attended more than 1,800 formal, Agency-sponsored training programs.

Major emphasis was placed on expanding in-house training, which offers significant cost savings and better quality control. Forty-two courses were offered within MarAd facilities, compared to 15 in the previous fiscal year.

Also increased were the number of technical training programs dealing specifically with the maritime industry.

Awards

In this reporting period, 16 MarAd employees received top honor awards. Three received Silver Medals, the Department's second highest award; nine received Bronze Medals, MarAd's highest honor award; and four were recognized for their contributions to the Equal Employment Opportunity Program.

Performance awards were granted to 202 MarAd employees, including 57 Quality Step Increases and 145 Special Achievement Awards.

Installations and Logistics

Real Property

At year's end the Maritime Administration's real property included the Reserve Fleet sites at Suisun Bay, Calif.; Beaumont, Tex.; and James River, Va.; a warehouse at Kearny, N.J.; the U.S. Merchant Marine Academy at Kings Point, N.Y.; and the Wilmington, N.C., Maritime Facility.

Radar training schools are operated at Pier 1, Fort Mason, San Francisco, Calif.; New Orleans, La.; Toledo, Ohio; Seattle, Wash.; and New York, N.Y. Regional Offices are operated in San Francisco; Cleveland, Ohio; New Orleans; and New York City. Market Development Offices are maintained in Long Beach, Calif; Chicago, Ill.; Seattle; Houston, Tex; Atlanta, Ga.; Detroit, Mich.; and in the four regional headquarters.

The Agency maintains the National Maritime Research Center at Kings Point, N.Y., and a Ship Management Office in Norfolk, Va.

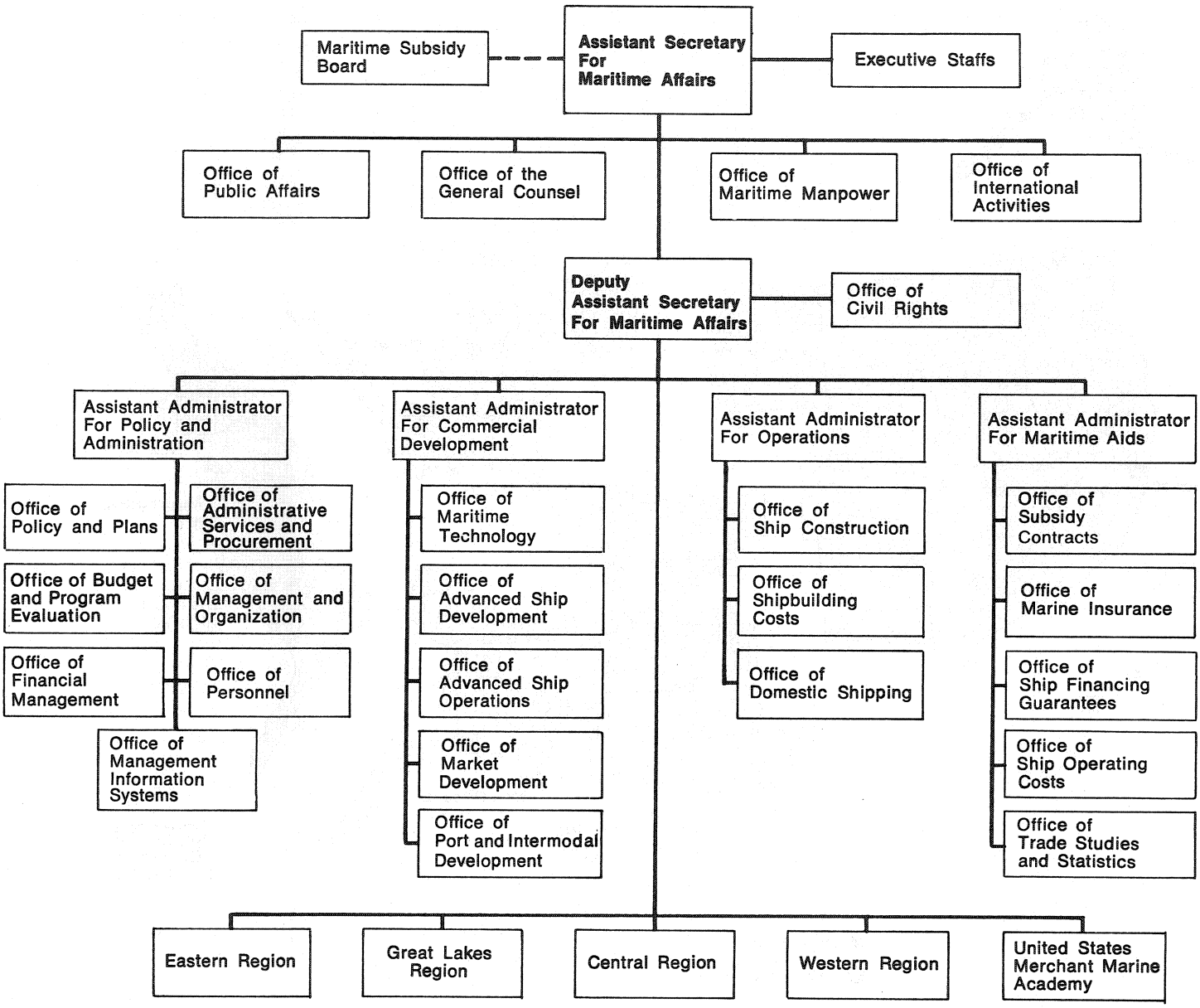
MarAd's Hoboken, N.J., terminal continued under lease to the Port Authority of New York and New Jersey.

Accounting

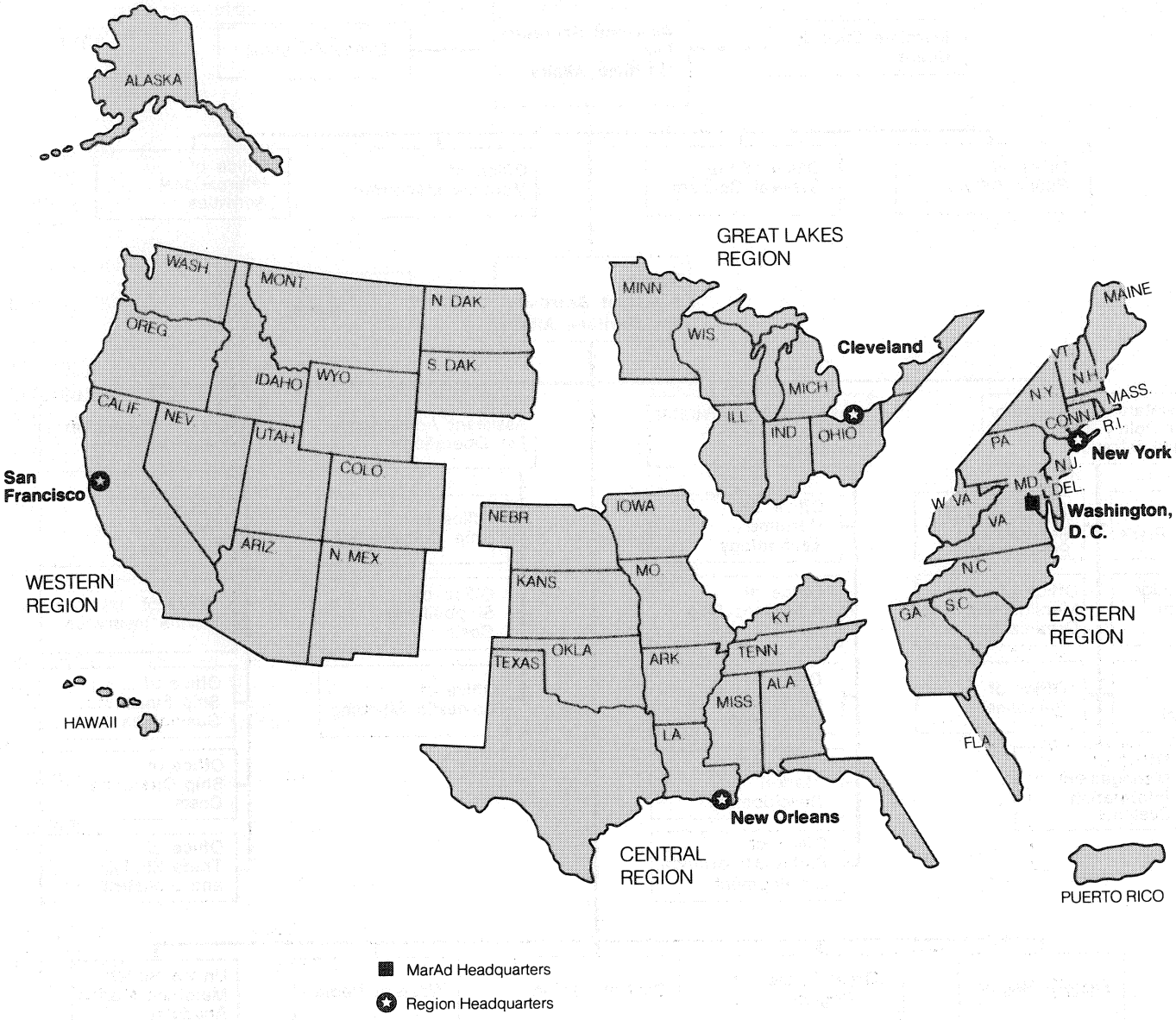
The accounts of the Maritime Administration were maintained on an accrual basis and in conformity with generally accepted accounting principles and standards, and related requirements prescribed by the Comptroller General. The cost of combined operations of the Maritime Administration for the year totaled $531.1 million. This included $472.5 million for ODS and CDS, $15.4 million for research and development, $28.3 million for administrative expenses, $12.5 million for operation of the U.S. Merchant Marine Academy, $4.2 million for maintenance and preservation of National Defense Reserve Fleet vessels, and $4.9 million for financial assistance to State maritime academies. MarAd received $6.7 million in other operating income, net of expenses.

Financial statements of the Agency appear in Exhibits 1-3.

Maritime Administration
Organization Chart



Maritime Administration
Field Organization



FINANCIAL STATEMENTS

U.S. Department of Commerce—Maritime Administration

Exhibit 1. Statement of Financial Condition

September 30, 1978, and September 30, 1977

Assets	September 30 1978	September 30 1977
Selected Current Assets		
Fund Balances with Treasury:		
Budget Funds	$ 708,985,732	$ 679,931,322
Deposit Funds	195,526	860,879
Allocation from Other Agencies	4,754,791	4,671,687
Budget Clearing Accounts	—	21,602
	713,936,049	685,485,490
Federal Security Holdings	71,741,000	137,275,000
Accounts Receivable:		
Government Agencies	2,438,913	3,361,501
The Public	12,829,484	4,991,640
Allowances (—)	—171,216	—171,216
	15,097,181	8,181,925
Advances To:		
Government Agencies	74,907	74,907
The Public	93,841	96,723
	168,748	171,630
Total Selected Current Assets	**800,942,978**	**831,114,045**
Loans Receivable:		
Repayment in Dollars	125,465,129	55,278,428
Allowances (—)	—45,950,888	—10,756,550
	79,514,241	44,521,878
Inventories:		
Raw Materials and Supplies	5,574,648	4,568,983
Real Property and Equipment:		
Land	5,898,348	5,898,348
Structures and Facilities	38,716,372	37,129,392
Equipment and Vessels	1,331,947,439	1,386,943,120
Leasehold Improvements	92,119	92,119
Allowances (—)	—1,286,276,682	—1,320,262,527
	90,377,596	109,800,452
Other Assets:		
Work-in-Process-Other	5,386,563	3,955,322
Materials and Supplies	727,319	622,121
Deferred Charges	1,786,360	749,544
Notes Receivable	26,912,069	—
Allowances (—)	—749,244	—749,244
	34,063,067	4,577,743
Total Assets	**$1,010,472,530**	**$ 994,583,101**

The notes and schedules to financial statements are an integral part of this statement.

FINANCIAL STATEMENTS

U.S. Department of Commerce—Maritime Administration

Liabilities

	September 30 1978	September 30 1977
Selected Current Liabilities (Note 2):		
Accounts Payable (including Funded Accrued Liabilities):		
Government Agencies	$ 1,273,003	$ 134,695
The Public	170,381,490	101,311,869
	171,654,493	101,446,564
Advances From:		
Government Agencies	4,547,089	4,905,370
The Public	16,247,809	21,828,495
	20,794,898	26,733,865
Total Selected Current Liabilities	**192,449,391**	**128,180,429**
Deposit Fund Liabilities	195,526	860,879
Unfunded Liabilities:		
Accrued Annual Leave	2,719,351	2,567,422
Other Liabilities:		
Vessel Trade-in-Allowance	641,777	372,887
Total Liabilities	196,006,045	131,981,617

Government Equity

Unexpended Budget Authority:		
Unobligated	389,601,932	369,058,728
Undelivered Orders	272,725,383	374,392,977
	662,327,315	743,451,705
Unfinanced Budget Authority (—):		
Contract Authority	—59,974,707	— 41,408,692
Invested Capital	206,168,424	160,528,747
Receipt Account Equity	5,945,485	29,724
Total Government Equity	814,466,485	862,601,484
Total Liabilities and Government Equity	**$1,010,472,530**	**$ 994,583,101**

The notes and schedules to financial statements are an integral part of this statement.

FINANCIAL STATEMENTS

U.S. Department of Commerce—Maritime Administration

Exhibit 2. Statement of Equity of U.S. Government

For Years Ended September 30, 1978, and September 30, 1977	Years Ended September 30	
	1978	**1977**
Balance Beginning of Fiscal Year	$ 862,601,484	$ 922,260,970
Additions:		
Funds Appropriated by Congress	561,575,000	456,200,000
Property Capitalized without Use of Funds	—	—
Property Transferred	—2,736,173	—6,199,945
Appropriation Transferred Out	—206,000	—
	1,421,234,311	1,375,261,025
Deductions:		
Net Cost of Combined Operations (Exhibit 3)	531,148,725	499,000,008
Payments into General Fund Receipts	75,619,101	10,663,203
Unobligated Balances Withdrawn or Restored (—)	—	—3,670
	606,767,826	509,659,541
Balance, Close Accounting Period (Exhibit 1)	**$ 814,466,485**	**$ 862,601,484**

The notes and schedules to financial statements are an integral part of this statement.

FINANCIAL STATEMENTS

U.S. Department of Commerce—Maritime Administration

Exhibit 3. **Statement of Operations**

For Years Ended September 30, 1978, and September 30, 1977

	Years Ended September 30	
	1978	**1977**
OPERATIONS OF MARITIME ADMINISTRATION:		
Net Costs of Operating Activities		
Reserve Fleet Programs:		
Depreciation on Vessels	$ 378,464	$ 9,012,093
Maintenance and Preservation	4,245,954	8,508,005
	4,624,418	17,520,098
Maritime Training Program	12,536,100	10,801,392
Maintenance of Shipyard and Warehouses	9,763	22,227
	17,170,281	28,343,717
Direct Subsidies and National Defense Cost:		
Operating-Differential Subsidies	370,566,015	328,181,751
Construction-Differential Subsidies	101,910,289	147,924,311
Cost of National Defense Features	647,679	893,507
	473,123,983	476,999,569
Administrative	28,313,196	25,507,627
Research and Development	15,397,801	15,943,740
Financial Assistance to State Marine Schools	4,896,185	4,837,763
	48,607,182	46,289,130
Other Costs (—Income)		
Loss on Sale of Obsolete Vessels	1,755,191	—889,097
Loss on Sale of Other Assets	72,248	—40,021
Inventory and Property Adjustments	13,794,571	—21,448,872
Interest Income	—1,096,071	—767,857
Miscellaneous (Net)	—16,116,359	—115,122
	—1,590,422	—23,260,969
Net Cost of Maritime Administration Operations	**537,311,024**	**528,371,447**
OPERATIONS OF REVOLVING FUNDS:		
Vessel Operations Revolving Fund	—210,466	—7,757
War Risk Revolving Fund	—382,094	—477,713
Federal Ship Financing Fund, Revolving Fund	—5,569,739	—28,885,969
Net Cost of Combined Operations (Exhibit 2)	**$531,148,725**	**$499,000,000**

The notes and schedules to financial statements are an integral part of this statement.

Notes to Financial Statements—September 30, 1978, and September 30, 1977

1. The preceding financial statements include the assets, liabilities, income, and expenses of the Maritime Administration; the Vessel Operations Revolving Fund; the War-Risk Revolving Fund; and the Federal Ship Financing Fund, Revolving Fund.

2. The Maritime Administration was contingently liable under agreements insuring mortgages and construction loans payable to lending institutions totaling $5,167,780,523 on September 30, 1978, and $4,716,772,258 on September 30, 1977. Commitments to insure additional loans and/or mortgages amounted to $433,202,725 on September 30, 1978, and $1,054,853,533 on September 30, 1977. U.S. Government securities and cash of $353,818,540 on September 30, 1978, and $489,972,220 on September 30, 1977, were held in escrow by the Government in connection with insurance of loans and mortgages which were financed by the sale of bonds to the general public. There were no conditional liabilities for prelaunching War-Risk Builder's Risk Insurance on September 30, 1978.

On both September 30, 1978, and September 30, 1977, the U.S. Treasury held in safekeeping for the Maritime Administration $130,000 of U.S. Government securities which had been accepted from vessel charterers, subsidized operators, and other contractors as collateral for their performance under contracts.

Appendix I: MARITIME SUBSIDY OUTLAYS—1936-1978

Fiscal Year	CDS	Reconstruction Subsidy	Total	ODS	Total ODS & CDS
1936-1955	$ 248,320,942[1]	$ 3,286,888	$ 251,607,830	$ 341,109,987	$ 592,717,817
1956-1960	129,806,005	34,881,409	164,687,414	644,115,146	808,802,560
1961	100,145,654	1,215,432	101,361,086	150,142,575	251,503,661
1962	134,552,647	4,160,591	138,713,238	181,918,756	320,631,994
1963	89,235,895	4,181,314	93,417,209	220,676,685	314,093,894
1964	76,608,323	1,665,087	78,273,410	203,036,844	281,310,254
1965	86,096,872	38,138	86,135,010	213,334,409	299,459,419
1966	69,446,510	2,571,566	72,018,076	186,628,357	258,646,433
1967	80,155,452	932,144	81,087,566	175,631,860	256,719,426
1968	95,989,586	96,707	96,086,293	200,129,670	296,215,963
1969	93,952,849	57,329	94,010,178	194,702,569	288,712,747
1970	73,528,904	21,723,343	95,252,247	205,731,711	300,983,958
1971	107,637,353	27,450,968	135,088,321	268,021,097	403,109,418
1972	111,950,403	29,748,076	141,698,479	235,666,821	377,365,300
1973	168,183,937	17,384,604	185,568,541	226,710,926	412,279,467
1974	185,060,501	13,844,951	198,905,452	257,919,080	456,824,532
1975	237,895,092	1,900,571	239,795,663	243,152,340	482,948,003
1976[2]	233,826,424	9,886,024	243,712,448	386,433,994	630,146,442
1977	203,479,571	15,052,072	218,531,643	343,875,521	562,407,164
1978	148,690,842	7,318,705	156,009,547	303,193,575	459,203,122
Total	**$2,674,563,762**	**$197,395,889**	**$2,871,959,651**	**$5,182,131,923**	**$8,054,091,574**

[1] Includes $131.5 million CDS adjustments covering the World War II Period, $105.8 million equivalent to CDS allowances which were made in connection with the Mariner Ship Construction program, and $10.8 million for CDS in fiscal years 1954 to 1955.
[2] Includes totals for FY 1976 and the Transition Quarter ending September 30, 1976.

Appendix II: COMBINED CONDENSED FINANCIAL STATEMENTS OF SUBSIDIZED OPERATORS [1]

(See Notes)

Statement A—Combined Condensed Balance Sheets December 31, 1977 (Amounts Stated in Thousands of Dollars)

ASSETS	
Current Assets:	
Cash	$ 37,737
Marketable Securities	107,882
Accounts Receivable	311,069
Other Current Assets	64,966
Total Current Assets	521,654
Special Funds and Deposits	180,189
Investments	60,372
Deferred ODS Receivable (See Contra)[2]	1,760
Property and Equipment Less Depreciation:	
Vessels	1,292,704
Other Property and Equipment	102,587
Other Assets	72,564
Voyages in Progress-Net	–0–
TOTAL ASSETS	**$2,231,830**
LIABILITIES AND NET WORTH	
Liabilities:	
Current Liabilities:	
Accounts and Notes Payable	$ 252,293
Current Long-Term Debt	26,228
Other Current Liabilities	121,784
Total Current Liabilities	400,305
Voyages in Progress-Net	61,645
Long-Term Debt	826,295
Recapture ODS (See Contra)[2]	1,760
Other Liabilities	170,551
Total Liabilities	1,460,556
Net Worth:	
Capital Stock	101,854
Surplus:	
Paid in Capital	213,695
Retained Earnings	455,725
Total Surplus	669,420
Total Net Worth	771,274
TOTAL LIABILITIES AND NET WORTH	**$2,231,830**

Statement B—Combined Condensed Income and Surplus Accounts Year Ending December 31, 1977
(Amounts Stated in Thousands of Dollars)

Shipping Operations:	
Revenue:	
Terminated Voyages	$ 1,655,550
Other Shipping Operations	10,757
Total Revenue	1,666,307
Expenses:	
Terminated Voyage Expense	
Wages, Payroll Taxes, Welfare Contributions	386,389
Subsistence	17,606
Maintenance and Repair	165,832
Insurance (Hull and P and I)	82,199
Total	652,026
Less: Operating-Differential Subsidy (ODS)	292,333
Total	359,693
Other Vessel Expense	220,749
Voyage Expense	723,358
Total Terminated Voyage Expense	1,303,800
Other Shipping Operations Expense	
Overhead	185,091
Depreciation on Shipping Property	74,250
Other Miscellaneous Shipping Expense	78,905
Total Expense	1,642,046
Gross Profit from Shipping Operations	24,261
Interest and Other Income	31,061
Interest and Other Deductions	73,404
Net Profit from Shipping Operations (Loss)	(18,082)
Non-Shipping Operations-Net Profit (Loss)	(52)
Ordinary Income before Federal Income Taxes	(18,134)
Provisions for Federal Income Taxes	7,048
Ordinary Income After Taxes	(25,182)
Extraordinary and Prior Period Items:	
Extraordinary Items-Net Income (Net Expense)	10,631
Federal Income Taxes Thereon (Net Expense)	3,171
Total	7,460
Net Income (Loss)	(17,722)
Add: Paid in Capital and Retained Earnings Beginning of Year	738,083
Total Surplus Available	720,361
Surplus Changes:	
Cash Dividends	46,386
Other (Net)	4,555
Total	50,941
SURPLUS (CAPITAL AND EARNED) END OF YEAR	**$ 669,420**

NOTES TO STATEMENTS A AND B
[1] The data were obtained from Forms MA-172 filed by 21 subsidized operators.
[2] Represents the Government's share of recapturable subsidy (ODS) deducted from subsidy payments pending settlement of complete 10-year subsidy recapture period.

Project	Task	Vendor	Contract Number	Amount [1]
	Advanced Ship Development			
Automated Pipe Shop*	Design, install and evaluate a semi-automated pipe fabrication facility for the manufacture and assembly of shipboard piping systems.	Avondale Shipyards New Orleans, La.	6-38061	$2,247,000
Computer-Aided U.S. Shipyard Manufacturing*	Assist the U.S. shipbuilding industry to plan and coordinate the cooperative development of computer-aided manufacturing techniques in shipyards, and document the preferred system.	IIT Research Institute Chicago, Ill.	5-38072	352,423
Autokon Support*	Conduct maintenance, provide periodic updates and management services to Autokon support groups utilizing the system's advanced manufacturing methods.	IIT Research Institute Chicago, Ill.	8-3044	40,000
Technology Survey of U.S. Shipyards	Assess the major differences between U.S. shipyard production technology and highly competitive foreign shipyards.	Marine Equipment Leasing Co. Falls Church, Va.	8-3037	181,138
Analysis of Competitiveness of U.S. Shipbuilding	Develop a forecasting methodology of U.S. shipyards position among world competitors, and determine the degree of effectiveness of alternative policies and regulations.	Pugh-Roberts Cambridge, Mass.	8-3033	47,395
Effect of Fuel Quality on Diesel Engine Performance	Identify the effects of various fuel oil contaminants and impurities on the performance of marine merchant vessel diesel engines.	Seaworthy Systems Essex, Conn.	8-3033	69,260
Ship Machinery Outfitting:				
Marine Burner Atomization*	Develop and test improved marine burner oil atomizers to assist in improving the combustion efficiency of marine diesel burners and evaluate the use of oil/water emulsification for improved burner atomization.	Combustion Engineering Windsor, Conn.	7-38010	556,470
Shoreside Emission Standards for Vessels In-Port	Review existing air quality rules for power generating equipment to determine their impact on merchant vessels in port.	Chi Associates Arlington, Va.	8-3072	89,645
Improved Boiler Reliability	Perform superheater tube materials testing on boilers aboard merchant vessels at sea at elevated temperatures to evaluate potential benefits they offer for reducing boiler maintenance cost.	Combustion Engineering Windsor, Conn.	6-38088	140,538

[1] "Amount" = MarAd funding in FY 1978.
* Asterisk indicates project is cost-shared. See Chapter 6.

Ship accompanied by tug steams up channel, entering harbor at Port Everglades, Fla.

Project	Task	Vendor	Contract Number	Amount
Application of Condensate Polishing*	Install, test and evaluate aboard ship of alternative boiler water treatment systems.	Drew Chemical Corp. Boontown, N.J.	8-3117	111,750
Improved Stern Tube Bearings and Seals	Conduct laboratory tests of materials and develop improved designs for stern tube bearings and seals.	Mechanical Technology Latham, N.Y.	6-38054	489,181
Astern Power Requirements	Determine the effect of increased astern power on ship stopping distances.	DeLaval Trenton, N.J.	7-38027	24,697
Coated Steel Propellor	Develop, test and evaluate the value of covered steel propellors for oceangoing merchant ships.	Daedalean Woodbine, Md.	7-38048	882,742
Gas Atmosphere & Electrostatic Control Model Stds.	Conduct operating evaluations at sea of previously developed and tested scale model systems.	Southwest Research San Antonio, Tex.	8-3080	148,905
Rationalization of Spare Parts	Develop a methodology for meeting the requirements for ship's spare parts on-board the vessel and at strategic shore locations.	Mystech Associates Mystic, Conn.	8-3046	264,491
Tank Level Indicating Systems	Identify and assess the accuracy of tank level indicating systems for cargo tanks aboard U.S. merchant vessels.	Southwest Research Institute San Antonio, Tex.	8-3067	224,987
Shipboard Maintenance Management System	Develop a shipboard maintenance management system for navigation and deck equipment.	Prudential Lines, Inc. New York, N.Y.	6-38082	15,000
Contra-Rotating Propulsion Model Testing	Perform model tests to verify the performance of the contra-rotating systems in merchant vessels.	David Taylor Naval Ship Research and Development Center Carderock, Md.	400-89017	42,700
Nuclear Ships:				
Licensing and International Standards for Nuclear-Powered Merchant Ships	Provide technical support for development of international operating standards for nuclear powered merchant ships as stipulated in the IMCO Code of Practice for Nuclear Ships.	Ship Analytics Old Mystic, Conn.	8-3014	81,344
International Nuclear Standards for the Design and Construction of Nuclear Powered Merchant Ships	Participate in the development of proposed nuclear marine standards for implementation by IMCO.	Interdevelopment, Inc. Arlington, Va.	8-3018	49,869
Agency Support:				
Weight Estimation of Ship's Components—Computer Program	Develop a computer program to automate ship design weight estimates for calculations of stability, trim, and paint area.	Chi Associates Arlington, Va.	8-3-21	96,410

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
	Advanced Ship Operations			
Cargo Control:				
International Cargo Data Interchange System*	Test the commercial Cargo Data Interchange System for processing international trade data for comparison with conventional cargo data information systems.	National Committee on International Trade Documentation New York, N.Y.	8-3107	84,155
Competitive Assessment Requirements Analysis	Perform an economic assessment of the competitive position of U.S.-flag shipping on a total origin/destination basis.	Simat, Helliesen & Eichner Newton Center, Mass.	8-3032	199,699
Export Booking and Billing*	Design, develop, test, and evaluate a computer-based, shipment booking and cargo documentation system for the U.S.-flag, ocean carrier community through a lead ship operator company.	American Export Lines New York, N.Y.	4-37126	172,280
Liner Shipping Operations Financial Performance Requirements Analysis	Define the financial performance parameters, ratios, and analytic techniques required to insure the long term stability and growth of the U.S.-flag shipping industry.	RDW Systems, Inc. Arlington, Va.	8-3078	93,718
U.S. Shipping Operations Resource Requirements Analysis	Perform a historical analysis of the cargo productivity and competitive position of the U.S.-flag merchant fleet to obtain a data base to assist formulating research projects to achieve greater productivity.	ECON, Inc. Princeton, N.J.	8-3029	179,621
Economic Impact of Government Regulations on U.S. Steamship Operators	Perform a review and document the incremental costs of U.S. government regulations on U.S.-flag ocean carrier companies relative to their flag-counterparts in economic, safety, and environmental areas.	Ernst & Ernst Washington, D.C.	8-3089	132,477
Maritime Satellite Ship Equipment (MARISAT)	Provide ship equipment compatible with the MARISAT commercial satellite system to enable vessel management experiments to be performed and evaluated.	COMSAT Washington, D.C.	5-38047	45,900
International Data Communications	Develop and implement a prototype global data communications system for U.S.-flag ocean carrier companies for cargo documentation equipment control and financial planning purposes.	Committee of American Steamship Operators Washington, D.C.	8-3085	424,000
Maritime Satellite	Provide satellite terminals for training U.S. merchant vessel radio operators in the use of satellite assisted communications.	ARA Technology Inst. for Marine Electronics New York, N.Y.	8-3048	25,950

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
Cargo Handling:				
Marine Refrigerated Container Monitoring*	Develop a technique whereby the condition of the air inside a refrigerated container and the performance of the equipment can be continuously monitored from a location distant from the container location aboard ship.	Sea-Land Service, Inc. Elizabeth, N.J.	8-3077	143,000
Moisture Control*	Utilize new construction techniques (wall coatings, double wall, escape channels) to provide methods to control sweating in marine freight containers and shipborne barges.	Farrell Lines New York, N.Y.	8-3088	$ 32,150
Marine Container Cargo Stowage Manual*	Develop a technical manual on the proper stowage and securement of cargo in containers to reduce damage and improve the average load factor.	National Cargo Bureau New York, N.Y.	8-3043	80,000
Marine Terminal Layout and Selection Criteria	Prepare a guide for optimizing container cargo flow through marine terminals based on the design layout and the types of handling equipment employed.	Matson Terminals San Francisco, Calif.	8-3102	237,525
Containership Conversion for Military Sea-Lift Command	Conduct a feasibility study for rapid conversion of containerships for military sealift.	M. Rosenblatt & Son New York, N.Y.	8-3057	174,911
Communications and Navigation:				
Spread Spectrum Techniques Employing Low Power Supply Concepts	Develop communications techniques for low power inexpensive ship terminals to utilize satellite data low rate services.	Mitre Corp. McLean, Va.	8-3108	161,000
Radio Technical Commission	Coordinate cooperative development among Federal agencies and industry for advanced marine communications, navigation, and other advisory services.	Federal Communications Commission Washington, D.C.	400-89001	14,482
MRIT Simulation of Advanced Marine Communication Traffic	Conduct operational evaluation of the Marine Radar Interrogator Transponder (MRIT) for navigation aids and marine terminal and coast wide traffic.	Mitre Corp. McLean, Va.	5-0058	139,727
Automated VHF Communication Support	Support ship performance and safety program on SCULPT, MRIT and IWACS.	Mitre Corp. McLean, Va.	7-38024	97,033

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
	Maritime Technology			
Mobilization Ship Model Design	Perform studies on preliminary design 204 break bulk cargo ships.	M. Rosenblatt & Son New York, N.Y.	7-38053	19,915
Marine Transportation Research Board*	Perform an analysis of maritime technological problems such as: Arctic research requirements, requirements for potential trade for developing nations.	National Academy of Sciences Washington, D.C.	400-89003	175,000
Future Maritime Environment	Evaluate the impact of future events on the maritime industry and identify relevant areas for research and development opportunity.	Forecasting International Arlington, Va.	8-3023	34,878
Chemical and Product Carrier Market and Technology	Investigate current and future needs of chemical and product carriers and determine technological areas of improvements in safety operations and effectiveness.	International Maritime Associates Washington, D.C.	8-3084	226,130
Pacific Coal Slurry Transportation*	Determine the potential of alternate coal slurry systems for the export of U.S. coal to the Far East.	Boeing Co. Seattle, Wash.	8-3038	320,542
Standardized Design for U.S.-Flag Dry Bulk Merchant Vessel	Develop vessel requirements for profitable operation of U.S.-flag dry-bulk operators.	M. Rosenblatt & Son New York, N.Y.	7-38053	33,632
Arctic Transportation Study*	Evaluate the economic feasibility of employing waterborne transport systems in support of Arctic commerce.	Department of Interior Washington, D.C.	400-89015	20,000
Ocean-Going Tug Barge Conference	Disseminate results of MarAd's integrated tug-barge research to industry and generate dialog for future tug-barge projects.	Fisher Maritime Transportation Counselors, Inc. South Orange, N.J.	8-3030	43,987
Ship Structures Research*	Conduct advance technology research in ship design, fabrication methods, and materials structural loads, for developing stress instrumentation and analysis.	National Academy of Science Washington, D.C.	400-89014	150,000
Propeller Induced Vibration Forces on Hull Surfaces	Produce a computer program to predict and validate hull forces documented in model test data for U.S. merchant vessels.	David Taylor Naval Ship Research Development Ctr. Carderock, Md.	400-69008	11,490
Improved Tandem Propeller Performance	Investigate and develop means for reducing or conserving fuel consumption for merchant vessels by hydrodynamic methods, producing design guide for improved propulsive devices and improved ship hull forms. The present work involves model tests with a tandem propeller.	David Taylor Naval Ship Research Development Ctr. Carderock, Md.	400-89012	130,000

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
Marine Transportation for National Petroleum Reserve-Alaska	Study alternatives for moving oil from National Petroleum Reserve-Alaska to the lower states.	J. J. McMullen New York, N.Y.	8-3082	245,633
Foreign Maritime Research Analysis	Analyze and compare U.S. and foreign maritime research in order to develop plans and project outlines for new opportunity for U.S. research activities.	Booz-Allen & Hamilton Bethesda, Md.	8-3003	145,000
Great Lakes Seatruck Study	Investigate the technical and economic feasibility of Seatruck (small, short distance trailer-ship with reduced crew size).	Booz-Allen & Hamilton Bethesda, Md.	8-3058	37,592
Harbor Support Craft	Determine the ability of surface effect craft to perform harbor missions such as search and rescue, security, fire fighting, passenger transport and civil defense.	City of Tacoma, Wash. Tacoma, Wash.	8-3062	114,216
Northwestern Alaska Transportation Implementation	Prepare a project implementation plan to incorporate industry briefings and reports.	Global Marine Newport Beach, Calif.	T-38164	14,818
Air Stabilized Platform	Test a new concept for floating offshore platforms—the use of captured pressurized air pockets in place of conventional buoyancy volume.	University of Hawaii Manoa, Hawaii	8-3104	62,226
Axial Flow Hydraulic Transmission in Ship Propulsion System	Conduct water tests of combined transmission and propulsion system to increase efficiency by permitting the propeller to be designed to operate at a more efficient RPM.	Office of Naval Research Arlington, Va.	400-89005	22,500
LNG Full Scale Maneuvering	Develop a systems identification technique which can identify ship resistance coefficients and also develop an LNG full scale maneuvering trial program.	Massachusetts Inst. of Technology Cambridge, Mass.	5-38073	64,300
Great Lakes Air Cushion Vehicle	Conduct demonstrations for improved design procedures using Air-cushion Vehicle in commercial icebreaking applications in the Great Lakes.	J. L. Decker Potomac, Md.	7-38036	13,681
Maneuvering Characteristics of Great Lakes Ships in Critical Channels	Perform operational analysis of maneuvering characteristics of Great Lakes ships in critical channels in all-season waters.	Stevens Institute of Technology Hoboken, N.J.	8-3083	341,914

* Cost-shared.

Appendix III: (Continued)

Project	Task	Vendor	Contract Number	Amount
Standard Kort Nozzle and Kitchen Rudder Tests	Perform model tests to determine the maneuvering efficiency of the Kort Nozzle and Kitchen Rudder design.	Hydronautics Laurel, Md.	8-3094	135,000
Tanker Maneuvering/Risk Analysis	Develop a model to analyze potential risks of collision and other accidents which may result in oil spills and study improved maneuvering methods to reduce probability of such an accident.	Systems Control, Inc. Palo Alto, Calif.	8-3079	120,000
Optimization of Propeller Skew Distribution to Minimize Vibration	Develop a methodology and computer program for use by propeller designers to specify optimum skew distribution.	University of Michigan Ann Arbor, Mich.	7-38077	38,938
Ship Radii Gyration	Determine if the values of radii of gyration are valid for modern ships and if not, what are the appropriate values.	R. W. Peach Engineering Arnold, Md.	8-3008	37,645
Redundant Twin Screw Merchant Ship Propellor	Determine the relative propulsive efficiencies of single screw and redundant twin screw bluff form designs.	Hydronautics Laurel, Md.	8-3004	11,100
Prediction of Ship Motion in Confined Waters	Validate a three-dimensional seakeeping program to predict the motions of floating bodies in confined waters to aid in solving offshore operational problems.	Austin Research Austin, Texas	8-3005	32,750
Hull Fouling Control*	Determine the basic mechanism of the release of toxins in antifouling paints in order to control fouling of ship hulls.	University of New Orleans New Orleans, La.	8-3049	31,953
University Research Program Planning	Conduct detailed planning, evaluation, and presentation aids and preparation tasks for the MadAd University Research Program.	Simat, Helliesen & Eichner Washington, D.C.	8-3073	60,725
Universities Basic Research Program:	Determine the effectiveness of tip sails on merchant vessel propeller performance.	Stevens Institute of Technology Hoboken, N.J.	8-3126	30,000
	Develop a decision support system for the pre-outfitting phase to aid in determining any pre-outfitting problems.	Georgia Tech. Res. Inst. Atlanta, Ga.	8-3074	43,641
	Develop an experimental system to assess and optimize methods for reducing wave production power generated by merchant ships.	Webb Institute of Naval Architecture New York, N.Y.	8-3125	32,960

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
	Prepare decision-making alternatives for port managers confronted with providing reception facilities for chemical tankers.	Massachusetts Inst. of Technology Cambridge, Mass.	8-3124	30,847
Maritime Research Information Service (MRIS)	Acquire, select, store, retrieve, and disseminate references to proposed, ongoing, and completed research and development projects and technical reports and journal articles in the maritime field.	National Academy of Science Washington, D.C.	5-38005	170,000
Update MarAd R&D Technical Report Abstracts	Provide a systematic means of collecting and selectively distributing MarAd R&D technical information to industry.	CADCOM, Inc. Annapolis, Md.	8-3100	92,190
Market Assessment:				
Market for Large Volume Shipments	Define the market for transportation of large (neo-bulk) cargoes and develop strategies for profitable U.S.-flag carriage.	Booz-Allen & Hamilton Bethesda, Md.	8-3086	133,140
Grain Commodity Flow Study	Determine the quantity of grain flows on origin to destination basis, and by mode of transportation.	U.S. Army Corps of Engineers Washington, D.C.	400-89016	49,000
Great Lakes Western Coal Market Assessment	Provide government and industry planning information on potential market for an environmental effects study of increased western coal transportation on the Great Lakes.	Department of Energy Argonne Laboratory Chicago, Ill.	400-89007	107,000
Ship Operator Conservation Demonstration*	Demonstrate and document energy savings potential of selected power plant, hull or operational improvements for U.S. merchant vessels.	Seaworthy Engines, Inc. Essex, Conn.	8-3068	95,836
Hull Performance	Develop an economic model and demonstration plan to illustrate cost and available energy savings of improved hull coatings and cleaning techniques.	Santa Fe Corp. Alexandria, Va.	8-3055	140,486
Copper Nickel Hull Sheathing	Investigate applicability of Cu-Ni sheathing for retrofit to existing steel ship hulls.	Sun Shipbuilding Chester, Pa.	8-3091	280,255
Energy Transportation:				
LNG Technology	Continue development of cryogenic properties data; test and evaluation of instrumentation and calibrations of equipment to ensure the safe transfer of LNG.	National Bureau of Standards Boulder, Colo.	400-89004	50,000

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
LNG Offshore Terminal Mooring Load Analysis	Design instrumentation package and coordinate with industry a program plan for determining relative motions and forces in mooring LNG ships to offshore terminals.	Fairchild Corp. Manhattan Beach, Calif.	8-3071	144,000
LNG Containment Integrity Application	Develop a system to predict fatigue failures for ship's LNG tanks.	Daedalean Woodbine, Md.	8-3097	217,255
LNG Vapor Suppression/ Fire Control	Evaluate available unique techniques for determining leaks from LNG ship's containment.	Department of Energy Washington, D.C.	400-89008	125,000
Materials for LNG Applications: Structural Composites and Aggregates	Develop data on mechanical and thermal properties of composites and aggregates in the structural containment of cryogenic gases.	National Bureau of Standards Boulder, Colo.	400-89019	100,000
Waterborne Facilities for Refuse Recycling	Perform a conceptual design and economic evaluation for waterborne systems to process municipal refuse.	Global Marine Develop. Newport Beach, Calif.	8-3081	94,993
Assessment of Asbestos Concentrations in Engine Rooms	Assess the health risks posed by airborne asbestos fibers in engine rooms.	IIT Research Institute Chicago, Ill.	5-38072	8,312
	National Maritime Research Center			
Human Resources In Ship Operations & Automation	Identify problems encountered by seagoing personnel and define potential solutions to these problems.	H. Lundeberg School Piney Point, Md.	80274 MA5-0070	191,611
Heavy Weather Damage Avoidance System	Develop installation modification specs and plans; receive data, check system performance and evaluate data for completeness for each voyage; transmit data for analysis and instruct ship personnel in system requirements on HWDAS North Pacific Trade Routes.	Maritime Engineering Service Dix Hills, N.Y.	80263 MA5-0037	20,000
Heavy Weather Damage Avoidance System Utilization Phase I—Software Definition	Analyze HWDAS data and evaluate ship performance at sea using HWDAS. Determine the reliability, utility, and effectiveness of the system in improving ship performance under adverse weather conditions on North Pacific Trade Routes.	Webb Institute of Naval Architecture New York, N.Y.	80264 MA5-0036	49,300
Ship Response Monitoring and Guidance System	Produce, install, and test a shipboard instrumentation system for heavy weather damage avoidance.	Edo Corp. College Point, N.Y.	80260 MA5-0072	31,300

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
Ship Response Monitoring and Guidance System—Ship Installation*	Install equipment for heavy weather damage avoidance aboard a MSC ship.	Military Sealift Command Washington, D.C.	400-89018	25,200
Ship's Speed Analysis System	Develop at-sea system to continuously identify the various factors (deterioration, environment, etc.) which cause ship speed and fuel losses.	Ecletech North Stonington, Conn.	80276 MA5-0074	155,914
Machinery Condition Monitoring Techniques	Develop techniques to detect the conditions of ship's machinery, thus permitting flexibility of intervals between machinery surveys and less machinery down-time.	Mara-Time Service Corp. Northport, N.Y.	80267 MA5-0061	37,386
CAORF, Management and Operation	Manage and operate CAORF (Computer-Aided Operations Research Facility at the National Maritime Research Center, Kings Point, N.Y.).	Grumman Systems Bethpage, N.Y.	5-38003	2,506,844
CAORF, Maintenance and Repair, Engineering and Logistics	Provide engineering, logistics, and technical support to maintain CAORF.	Sperry Marine Systems Inc. Great Neck, N.Y.	8-3027	1,814,731
CAORF Data Base Generation System	Provide a capability to rapidly generate detailed data bases such as visual scenes radar and situation displays, water depths, and currents channel banks, simultaneously.	Sperry Marine Systems Inc. Great Neck, N.Y.	8-3027	472,205
Situation Display Graphics for Low Speed Hydrodynamics, Tug Forces and Docking	Provide a graphic outline of own ship's plan view at the Control Station Situation Display and show tug force direction and magnitude. This will provide information for research involving tubgoats and low-speed maneuvering in the presence of passing ships, banks, and docks.	Sperry Management Systems, Inc. Great Neck, N.Y.	80273 MA5-0068	137,703
CAORF On-Line Plotting of Own Ship's Position and Heading	Provide on-line, own ship's position and heading to CAORF for use in analysis of own ship's maneuvering. Data to be displayed on an X-Y plotter.	Sperry Management Systems, Inc. Great Neck, N.Y.	80261 MA5-0012	35,763
CAORF Low and Zero Speed Hydrodynamics Software	Develop, test, and install the necessary force and moments on own ship to simulate ship dynamics at very low and zero speeds on own ship for CAORF experiments.	Sperry Management Systems, Inc. Great Neck, N.Y.	80269 MA5-0065	118,204
CAORF Ship's Dynamics Interactive Graphics	Provide interactive graphics for use in experimental design to include a wide range of vessels and ports.	Grumman Data System Bethpage, N.Y.	80265 MA5-0034	54,623

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
	Office of Port and Intermodal Development			
Port Facilities Inventory	Expand the capability of the computer maintained Port Facilities Inventory System by improving the data reporting requirements and update the system.	Galler Associates Towson, Md.	8-3061	42,337
Texas State Port Study*	Conduct site selection analysis method for dredged materials. Port facility inventory update commodity flow analysis for port planning; port economic impact analysis at State level using Texas tables input/output.	Texas General Land Office Austin, Texas	8-3095	74,807
Oregon State Port Study*	Perform an analysis of commodity flows and port capacities and update of facilities inventory for forecast requirements as part of State transportation plan.	State of Oregon	8-3054	75,000
Hawaii State Port Study*	Analyze port facility needs as part of a plan for a middle Pacific cargo interchange and transshipment center for international trade and forecast port needs in the face of future demands for goods.	Hawaii Dept. of Transportation	8-3096	125,000
Alaska State Port Study*	Analyze the potential cargo flow and port location and capacity requirements on the Bering Sea Coast of Alaska as the State develops mineral resources in its hinterland.	Alaska Dept. of Transportation	8-3115	75,000
Maryland State Port Study*	Examine the flow of international cargo through the Port of Baltimore and also the State's inter- and intra-state waterborne cargo movements for incorporation into a state transportation plan.	State of Maryland	8-3060	19,797
Mid-America Ports Study*	Continue a major port planning effort which involves ports in the Mississippi River Basin and Gulf Coast region and the eight Great Lakes States to develop an interface between Gulf Coast and Mississippi River ports. The interface develops from an analysis and pin-point tracking of commodity flows between facilities in a newly created inventory.	Tippet, Abbets, McCarthy, Stratton New York, N.Y.	7-3006	55,463

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
Buffalo Coal Port Study	Analyze and estimate the demand for western coal consumption in the Northeast region of the U.S. which would be transshipped through Buffalo's waterport facilities.	Niagara Frontier Region Buffalo, N.Y.	8-3053	85,000
Great Lakes Port Study	Analyze potential cargo and projected facility requirements for developing future marketing strategy in the Great Lakes Region.	Frederick R. Harris Inc. Lake Success, N.Y.	7-38057	199,202
Emergency Berth Utilization Reporting System (Module I)	Develop a computer based system to provide MarAd and the National Shipping Authority the capability to plan, control, and schedule the utilization of berth capacity in U.S. ports in times of national and limited emergencies.	Systems Development Corp. McLean, Va.	8-3042	90,000
National Trade/Vessel Analysis System	Develop an informational system capability to monitor the movement of commodities in U.S. foreign trade by geographical region and vessel type.	Temple, Barker & Sloane Wellesley Hills, Mass.	8-3050	39,966
Energy Conservation Guide for Port Operators	Identify promising areas of energy conservation in the port and marine thermal industries through an assessment of current use patterns and develop management programs and a manual for waste in energy use, through training programs and energy consumption criteria in U.S. ports.	Automated Management Systems, Inc. Lanham, Md.	8-3076	44,745
Vessel In-Port Locator System	Conduct a demonstration of the prototype Vessel In-Port Locator System and convene a technology transfer conference.	ARINC Research Corp. Annapolis, Maryland	8-3098	59,152
Electronic Data Interchange System for Public Marine Terminals	Conduct a feasibility study of electronic interchange between intermodal carriers, shippers and public marine terminal operators.	ARINC Research Corp. Annapolis, Maryland	8-3101	119,808
Local Port Economic Impact Methodology	Produce a standard approach, format, and indices to be used by local ports in the development of economic impact reports.	Pacific Coast Assoc. of Port Authorities Palo Alto, Calif.	8-3047	76,800
Tanker Berthing System Development Amendment*	Conduct docking simulations at CAORF to develop techniques and procedures in vessel handling to assist in reducing the probability of spill producing damage at liquid bulk terminals.	David Taylor Naval Ship Research Development Center Carderock, Md.	400-79017	20,000

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
Tug Firefighting Module Demonstration*	Demonstrate economic and operational feasibility of temporarily mounting air-transportable pump and monitor modules on commercial tugs during fire emergency so that local fire services can base a decision as to purchase of such modules to augment their ability to fight waterfront or shipboard fires.	National Aeronautics and Space Administration Washington, D.C.	400-89010	100,000
Arctic Terminals for Icebreaking Tankers	Determine the cost to load crude oil from Northwest Coast of Alaska via terminal facilities into U.S. tankers with icebreaking capabilities.	Bechtel Corp. San Francisco, Calif.	8-3028	97,834
Improved Productivity for Bulk Commodity Transfer Facilities in the Great Lakes Trade Area	Assess the cost/benefits of potential bulk commodity (grain excluded) transfer facility upgrading or new construction in order to provide better transport service for vessels, inland transport, and shippers in the Great Lakes trade area.	Ernst & Ernst Washington, D.C.	8-3034	108,175
Design of a Port & Terminal Capacity Handbook	Develop a handbook to assist in calculating throughput capacities of U.S. ports and terminals for national emergencies.	Moffatt & Nichol Long Beach, Calif.	8-3093	97,200

* Cost-shared.

Appendix IV: STUDIES AND REPORTS RELEASED IN FY 1978

The following studies or reports were released by the Maritime Administration during fiscal year 1978.

A limited number of copies of publications marked [MarAd] are available from the Office of Public Affairs, Maritime Administration. Publications marked [GPO] are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Those labelled [NTIS] may be purchased from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161.

MARAD '77 (The Annual Report of the Maritime Administration for Fiscal Year 1977), 105pp, $2.75 [GPO]

Introducing the Maritime Administration, August 1978, 20pp [MarAd]

Vessel Inventory Report, as of June 30, 1978, October 1978, 56pp [MarAd]

Foreign Flag Merchant Ships Owned by U.S. Parent Companies as of December 31, 1976, May 1978, 63pp, $1.30 [GPO]

Maritime Metric Practice Guide, December 1978, 28pp, [MarAd]

Relative Cost of Shipbuilding—A Report to the Congress on the Relative Cost of Shipbuilding in the Various Coastal Districts of the United States, October 1978, 34pp, [MarAd]

What U.S. Ports Mean to the Economy, September 1978, 58pp, [MarAd]

Current Trends in Port Pricing, August 1978, 101pp, [MarAd]

Index of Current Regulations of the Maritime Administration, Maritime Subsidy Board, National Shipping Authority (revised as of January 1, 1978) 46pp, [MarAd]

Economic Impact of the U.S. Port Industry—An Input/Output Analysis of Waterborne Transportation, August 1978, [MarAd]

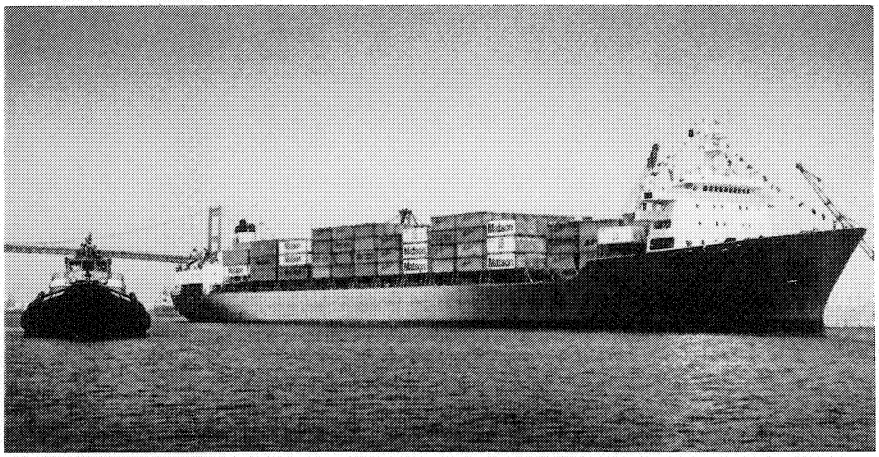
Volume I	Report
Volume II	Statistical Background

The U.S. Merchant Marine and the International Conference System, prepared by Harbridge House, Inc., 1978, 234pp, PB-284494/AS $8 [NTIS]

U.S.-Flag Transportation of Perishable Imports and Exports, prepared by Manalytics, Inc., September 1978

Volume 1:	Summary 27pp PB-285038/AS $4.00
Volume 2:	Research Report 184pp PB-285039/AS $7.50
Volume 3:	Appendixes 196 pp PB-285040/AS $5.50
Set:	PB-285037/Set $17.50

Merchant Fleet Forecast of Vessels in U.S.-Foreign Trade, prepared by Temple, Barker, and Sloane, Inc. May 1978, 277pp PB-285071/AS $9.25, [NTIS]



SS MAUI, newest member of Matson fleet, sails down main channel, Port of Los Angeles, outbound on her maiden voyage to the Hawaiian Islands. 26,000-dwt. containership was delivered by Bath (Maine) Iron Works in May 1978.

Acknowledgments

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