MARAD 1979

U.S. DEPARTMENT
OF COMMERCE

Maritime
Administration

NOTE:

During the period covered by this report Philip M. Klutznick succeeded Juanita M. Kreps as Secretary of Commerce and Samuel B. Nemirow succeeded Robert J. Blackwell as Assistant Secretary of Commerce for Maritime Affairs.

ABOUT THE COVER AND PICTURES ON PAGES IV AND VI: Cover photo shows U.S.T. ATLANTIC, largest ship ever built in U.S.; first of two 390,770-dwt. tankers delivered by Newport News Shipbuilding and Dry Dock Co. to U.S. Trust Co., N.Y., and operated by IOT Corp., Philadelphia. On page iv, huge propeller and rudder of vessel undergoing repair in Port of Baltimore. On page vi, Port of Portland, Ore., workers spray-paint anchor chain. Repair activity in these and other ports and yards attest to generally healthy status of U.S. ship repair industry in FY 1979.

MARAD 1979

The Annual Report of the Maritime Administration for Fiscal Year 1979

JULY 1980

U.S. DEPARTMENT OF COMMERCE
Philip M. Klutznick

MARITIME ADMINISTRATION
Samuel B. Nemirow
Assistant Secretary
for Maritime Affairs

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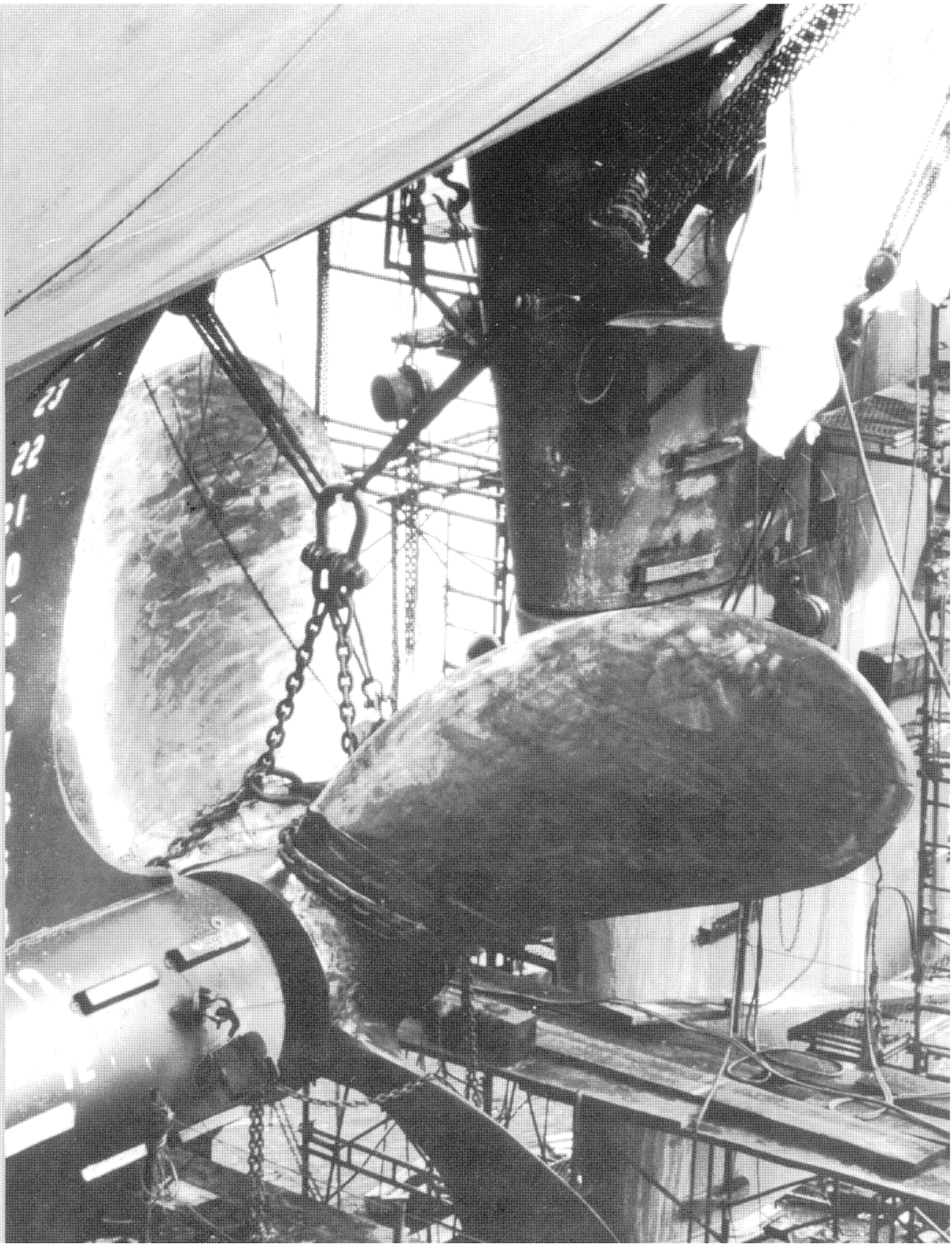


THE SECRETARY OF COMMERCE
Washington, D.C. 20230

Sirs:

It is my honor to submit the annual report of the Maritime Administration for fiscal year 1979.

While the Agency's programs are amply described in the report, I call your specific attention to the following:

* The privately owned, oceangoing U.S. merchant fleet reached a record carrying capacity of 20 million deadweight tons, although the number of ships in the fleet declined during the year.

* Fifty-six new merchant vessels totaling 2.9 million deadweight tons and valued at $3.4 billion were under construction or on order in U.S. shipyards on September 30, 1979.

* Twenty new merchant vessels were delivered by American yards. Included was the 390,770-deadweight-ton U.S.T. ATLANTIC, the largest ship ever built in this country.

* Construction-differential subsidy was granted for 14 new merchant vessels and the reconstruction of three others--the most awards under this Federal program since 1973.

* In conjunction with trade talks held in Beijing in May 1979, the Department of Commerce initiated discussions on a bilateral maritime agreement between the United States and the People's Republic of China.

The report indicates that, while the maritime industry showed modest gains in this reporting period, the competition for cargoes continues to increase in U.S. oceanborne foreign commerce, and the near-term outlook for commercial shipbuilding is clouded. We cannot afford to overlook either the magnitude or significance of the problems facing this industry. However, as a result of initiatives by this Administration and the Congress, and the American merchant marine's long tradition in delivering the goods, the 1980s could become a decade of progress for this vital segment of our economy.

Sincerely,

Secretary of Commerce

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

FOREWORD

The period covered in MARAD 1979 has been marked by unprecedented administrative and legislative initiatives to bolster the U.S. maritime industry. As a result of this intensive activity, both in the public and private sectors, this may well be regarded in the future as a pivotal year in U.S. shipping and shipbuilding—not so much perhaps for what was done as what was said and plans that were laid for the industry.

By dint of the calendar, of course, it was the period that bridged the old and new decades. Coincidentally (but not too surprisingly) the 1970s ended as they began–with an intensive, far-reaching re-evaluation of the U.S. maritime industry.

Not since the enabling legislation of the Merchant Marine Act of 1970 (some would say, the *1936* Act) was in final debate on Capitol Hill had the U.S. maritime community taken such a thorough, diagnostic look at the health of our merchant fleet, our shipyards, and waterborne trade. Nor had there been an assessment which generated such a multiplicity of suggestions as to the industry's statutory, regulatory, and promotional requirements as that which prevailed as we approached the threshold of the 1980s. If there was no consensus, it was not for lack of either human effort or opinion.

This Annual Report of the Maritime Administration describes Government programs and industry developments which characterize the status of, as well as the general concern for, the U.S. merchant marine as a vital part of our peacetime transportation system, foreign and domestic trade, total economy, and national security. The narrative and the statistics contained herein also indicate that, while no era is without its problems, considerable progress was made both in fiscal year 1979 and the past decade in the American maritime industry. And the maritime policy initiatives taken by both the Executive and Legislative Branches of the U.S. Government in these past few months promise to provide us with constructive plans and tools to strengthen our shipping and shipbuilding industries in the 1980s.

President Carter's maritime policy recommendations, including initiatives to revitalize an inadequate U.S.-flag dry-bulk fleet, were sent to the Congress on July 20, 1979.

Within a span of a few weeks—before and after that date—a dozen pieces of major maritime legislation were introduced in the Congress. Key provisions of those bills as they stood on September 30, 1979, are outlined on the following two pages of this report.

Thus, in an industry noted for cyclical extremes in economic activities, we have ended one cycle and begun another. Whatever progress we make in the uncharted waters which lie ahead may well depend, as it did in the 1970s and the more distant past, on how well we plan for contingencies and adjust to change. We can be certain that the future will challenge the best in all of us.

SAMUEL B. NEMIROW
Assistant Secretary of Commerce
for Maritime Affairs

Major Maritime Legislative Proposals—Fiscal Year 1979

U.S. House of Representatives

Bill No. H.R. 4769 Sponsor: Rep. John M. Murphy

A bill "To revitalize maritime policy, reorganize certain Government agencies, and reform regulation of maritime affairs in the United States."

Major Provisions

Most ocean shipping activities would be exempt from the antitrust laws.

Conferences could enter into intermodal agreements.

Conferences could be closed to cross-traders.

The formation of shippers' councils would be authorized.

All conference agreements would be effective 30 days after filing unless the Federal Maritime Commission (FMC) rejects an agreement for good cause shown.

Freight forwarders would post a bond in lieu of FMC licensing.

FMC investigation and enforcement powers would be strengthened.

Subsidized ships would be given more latitude to participate in the Jones Act trades.

Operating-differential subsidy (ODS) would be made available for some foreign-built, U.S.-flag ships.

The requirement of service on an "essential trade route" as a condition of subsidy would be eliminated.

The requirement for the use of materials and components made in the United States would be relaxed.

ODS operators would be authorized to suspend contracts to participate in cargo-preference trades.

Restrictions on the ownership of foreign-flag or domestic-trade ships by ODS operators would be greatly reduced.

U.S. firms' earnings from foreign shipping to be eligible for deposit in Capital Construction Fund (CCF) accounts.

Tax Code to be amended to allow shipowners to claim 100 percent of the investment tax credits on vessels built with CCF funds.

Statutory authority for the payment of construction-differential subsidy (CDS) and ODS on ships engaged in foreign-to-foreign trades would be clarified and extended.

No CDS would be paid to shipyards with inefficient work rules.

Direct Federal payments to shipyards for capital improvements would be authorized.

CDS authority would be used to maintain shipyard mobilization base.

Capital investments for ships and shipyards could be deducted as immediate business expenses.

Reciprocal tax exemption for foreign-flag shipping would be amended to exclude flag of convenience operations.

The definition of "U.S. income" for foreign-flag operations in the U.S. would be expanded.

Exclusion from U.S. taxation of investments in, or earnings from, foreign-flag shipping by U.S. companies would be ended.

United States Trade Representative would be given authority over the administration of maritime policy and FMC decision-making.

Bill No. H.R. 5113 Sponsor: Rep. Corrine C. (Lindy) Boggs

A bill "To promote orderly and efficient ocean transportation of bulk commodities in the foreign commerce of the United States, and for other purposes."

Major Provisions

Secretary of State would be directed to negotiate "governing international maritime agreements" with all countries involved in more than 5 percent of the U.S. bulk trades.

Signatories would each reserve 40 percent of trade for national flag ships and must have equal shares in the trade.

Congress would have 60 days to reject any agreement after signature.

Signatories could waive cargo portion for up to 10 years so long as other signatory has right of first refusal.

U.S. would assist signatories in development of bulk fleet, using Titles V and XI of the Merchant Marine Act, 1936, as amended.

Five years after enactment, it would be illegal to ship any U.S.-bulk cargo in non-signatory ships.

Bill No. H.R. 5145 Sponsor: Rep. Paul S. Trible, Jr.

A bill "To promote competitive United States-flag bulk cargo carrying vessels in world trade, to stimulate construction of modern bulk cargo-carrying vessels for domestic and foreign trade built in shipyards of the United States, and for other purposes."

Major Provisions

Bulk ships would be free to operate either in the domestic trades or the subsidized foreign trades.

A per diem subsidy covering both ODS and CDS would be paid to bulk ships for time actually spent in foreign trades.

Interest would be included in each per diem CDS payment for the time between date of construction and the date of payment.

Eligibility for per diem would be certified prior to construction to facilitate financing.

"World rates" would be presumptively fair and reasonable for cargo-reservation program.

"Foreign trade" would be expanded to cover foreign-to-foreign commerce.

United States Senate

Bill No. S. 1460
Sponsor: Sen. Daniel K. Inouye

A bill "To amend the Shipping Act, 1916, to clarify and improve the provisions relating to cooperative activity among common carriers by water, to permit the establishment of shippers' councils, and for other purposes."

Major Provisions

The FMC could approve any rate spread for a Section 14(b) contract which it found to be reasonable.

The formation of shippers' councils would be authorized.

Conferences would be authorized to enter into intermodal agreements.

The FMC would have to approve all Section 15 agreements which it found to be reasonable means of achieving the economic objectives of the parties and consistent with the Shipping Act. The FMC would not have to consider the status of the agreements under the antitrust laws.

Section 15 agreements which established a right of independent action, were endorsed by shippers' councils, or which implemented an inter-governmental agreement would be presumptively valid.

Conferences could be closed to cross trades.

Bill No. S. 1462
Sponsor: Sen. Daniel K. Inouye

A bill "To amend the Shipping Act, 1916, and the Merchant Marine Act, 1936, to promote comity with United States trading partners, and to encourage certain maritime agreements in the foreign commerce of the United States, and for other purposes."

Major Provisions

Carriers could enter into "reciprocal ocean transport agreements" to establish pooling and cargo-allocation arrangements.

The Government would be directed to enter into bilateral "liner shipping agreements" with U.S. trading partners.

Both types of agreements would have to offer at least 40 percent of the trade or a share equal to that of the trading partners, whichever is greater.

Participants in the agreements could not discriminate against U.S. carriers, shippers, exporters, importers, or ports.

All agreements among carriers would be presumptively valid and could not be challenged by the FMC except on complaint by a commercial party affected by the agreement.

The Secretary of Commerce would be directed to establish a "Maritime Industry Advisory Committee" made up of industry representatives.

Bill No. S. 1463
Sponsor: Sen. Daniel K. Inouye

A bill "To amend the Shipping Act, 1916, to improve the efficiency, service, and organization of common carriers by water in foreign commerce, to extend existing antitrust law exceptions to intermodal transportation agreements, and for other purposes."

Major Provisions

The maximum rate spread under a Section 14(b) contract would be 13 percent if only the shipper and carrier were parties and 18 percent if the consignee was also a party.

The FMC would be given the power to review merger acquisition and conference-wide intermodal agreements.

The formation of shippers' councils would be authorized.

All agreements would be valid 60 days after filing unless the FMC found on complaint that it was reasonably likely that they were in violation of the Shipping Act, and that the complainant would be irreparably injured by implementation. The burden of proof would be on the opponents of approval.

The penalties for violating the Shipping Act would be increased and the application of the antitrust laws to the regulated activities would be ended.

The President, on recommendation from the FMC, could close U.S. ports to the ships of the countries which discriminated against U.S. shipping.

Bill No. S. 1849
Sponsor: Sen. Howard W. Cannon

A bill "To amend Sections 503, 504, 606(6), 804, and 905(a) of the Merchant Marine Act, 1936."

Major Provisions

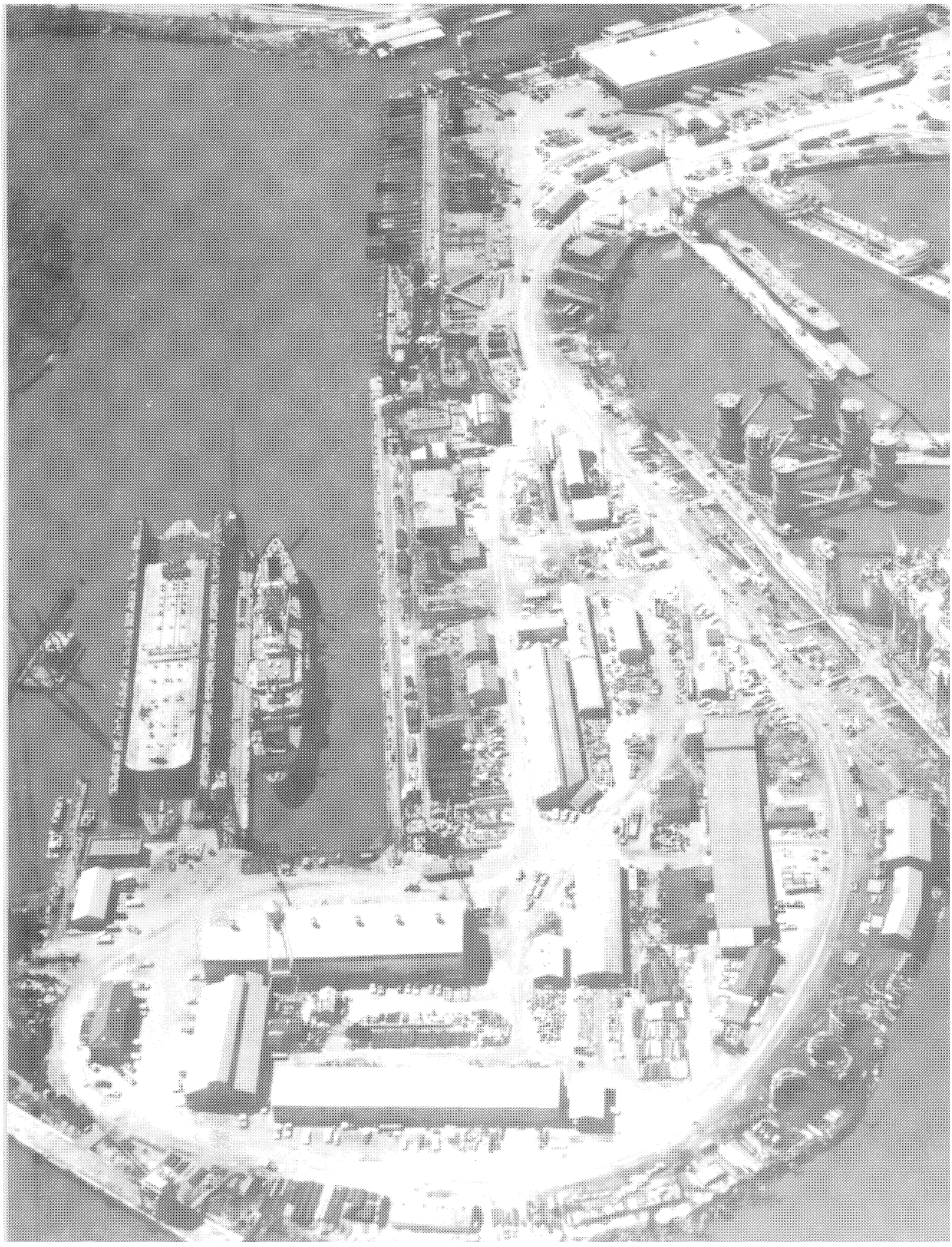
The period of mandatory U.S. documentation for dry-bulk ships built under CDS would be reduced to 10 years.

U.S. operators of dry-bulk ships built with CDS would be authorized to make repairs abroad without subsidy.

The sale of dry-bulk vessels built with CDS to foreign interests after 10 years' U.S. documentation would be authorized, subject to conditions assuming use by the U.S. of the ship in a national emergency.

Limitations on the ownership of foreign-flag ships by U.S. dry-bulk operators receiving subsidy would be relaxed.

Subsidized dry-bulk ships could trade worldwide.



Chapter 1

Shipbuilding

Contract Awards

During fiscal year 1979 the Maritime Administration (MarAd) granted construction-differential subsidy (CDS) for 14 new, highly productive merchant ships, and the reconstruction of three existing vessels, the largest number of awards since 1973. The new ships have a total contract value of $845 million, including the cost of national defense features incorporated in the vessels. They comprise five 32,000-deadweight-ton (dwt.) dry-bulk carriers for Levingston Falcon I Shipping Co.; three 39,500-dwt. integrated tug/barge chemical/oil vessels for subsidiaries of Occidental Petroleum Corp.; three 23,500-dwt. Roll-On/Roll-Off (RO/RO) containerships for Waterman Steamship Corp.; and three 32,800-dwt. containerships for American President Lines. (See Table 1 for FY 1979 contract awards and vessels under CDS contract on September 30, 1979.)

Private contracts were awarded in FY 1979 for the nonsubsidized construction of 11 vessels totaling 377,000 dwt. and including five product tankers, two tug/barge tankers, two self-unloading Great Lakes bulk carriers, and two large self-propelled hopper dredges (see Table 2).

Aerial view of Bethlehem Steel's Beaumont, Tex., Shipyard depicts wide range of building and repair facilities.

As of September 30, 1979, there were 56 new merchant vessels aggregating 2.6 million dwt. with a total contract value of $3.4 billion on U.S. shipyard orderbooks. (A year earlier, 59 vessels were on order.) Of the 56 vessels, 30 were being built with CDS, and all but one of the CDS vessels also were participating in the Federal Ship Financing (Title XI) Guarantees Program. In addition, six of the remaining 26 privately financed vessels carry Title XI guarantees (for a total of 35 covered by that program).

As of September 30, 1979, there were 31 offshore oil-drilling rigs on order or in production in five U.S. shipyards, compared to 23 units a year earlier.

One merchant ship contract involving Federal aid was cancelled during the year. On June 14, 1979, Cumberland Shipping Co., Seatrain Shipbuilding Corp., and the Maritime Administration agreed to cancel a contract for a self-propelled, oceangoing RO/RO barge of 4,700 dwt.

Construction Subsidy

MarAd is authorized to pay construction-differential subsidy to reduce or eliminate the cost disparity which exists between U.S. and foreign shipbuilding prices. This subsidy, the difference between the shipbuilding costs in an American shipyard and a reasonable estimate of costs in a foreign shipyard, may not exceed 50 percent of the domestic shipbuilding costs.

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 essential foreign commerce.

The combined costs on the vessels which were under CDS contracts for construction or reconstruction on September 30, 1979, totaled $2 billion, of which $795.6 million will be paid by the Government. The new vessels being built with CDS consisted of five liquefied natural gas (LNG) carriers, one tanker, six containerships, three cargo vessels, five integrated tug/barge vessels, three RO/RO containerships, two lighter-aboard ship (LASH) vessels, and five dry-bulk carriers. In addition, two LASH vessels were undergoing reconstruction, and the reconstruction of a third LASH was completed during the fiscal year. (CDS expenditures since 1936 are summarized in Appendix I.)

There were 43 CDS applications for 117 new vessels on file at MarAd at the close of the fiscal year. However, a number of these applications have been pending for some time and, under current criteria, are considered dormant (although subject to reactivation upon request.)

Additionally, seven companies of the Berger Group have filed CDS applications for the retrofitting of their seven tankers and two ore/bulk/oil (OBO) vessels to comply with provisions of the Port and Tanker Safety Act of 1978. The applicants are Aeron Marine Shipping Co., Aquarius Marine Co., Aries Marine Shipping Co., Atlas Marine Co., Northwest Shipping Corp., Worth Oil Transport Co., and Yeon Shipping Corp.

Table 1: SHIPS UNDER CDS—SEPTEMBER 30, 1979

Owner	Shipbuilder	Ship Type
Contracts Awarded in FY 1979:		
American President Lines	Avondale Shipyards	CN
Levingston Falcon I	Levingston Shipbuilding	DBC
Prudential Lines[2]	Newport News Shipbuilding	LASH
Suwannee River Finance	Avondale Shipyards	TB
Suwannee River SPA Finance	Avondale Shipyards	TB
Suwannee River Phosphate Finance	Avondale Shipyards	TB
Waterman Steamship	Sun Shipbuilding	RO/RO
Waterman Steamship	Sun Shipbuilding	RO/RO
Total (FY 1979)		
Undelivered Vessels Under Contracts Awarded prior to FY 1979:		
American Atlantic Shipping	Equitable Shipyards	BBC
Coordinated Caribbean Transport	Manhattan Barge/Marinette	TB
El Paso Columbia	Avondale	LNG
El Paso Cove Point	Avondale	LNG
El Paso Savannah	Avondale	LNG
Farrell Lines	Bath Iron Works	CN
Farrell Lines	Bethlehem (Sparrows Pt.)	CN
Lachmar	General Dynamics	LNG
VLCC II	Newport News SB & DD	COT
Waterman Steamship	Avondale	LASH
Total (Prior to FY 1979)		
Total All Ships under CDS September 30, 1979		

No. of Ships	Total Deadweight	Estimated Completion Date	Total Estimated Cost [1] (Millions)	Estimated CDS (Millions)	Estimated Cost NDF (Thousands)
3	98,400	4-82	$273.0	$135.3	$1,066
5	175,000	11-82	200.3	98.1	185
3	89,460	11-79	4.9	2.2	-0-
1	40,134	7-80	54.7	26.9	181
1	40,134	9-80	54.7	26.9	181
1	40,134	11-80	54.7	26.9	181
2	77,000	5-81	137.4	66.4	1,573
1	38,500	11-81	70.5	34.4	742
17	**598,762**		**$850.2**	**$417.1**	**$4,109**
3	6,660	12-79	$ 28.7	$ 13.9	$ 195
2	13,542	6-80	42.4	16.2	-0-
1	63,170 [3]	indefinite	106.0	17.5	20
1	63,170 [3]	indefinite	100.0	16.5	20
1	63,170 [3]	indefinite	103.0	17.0	20
1	16,343	2-80	43.2	21.4	91
2	54,680	2-80	156.8	77.8	72
2	127,200 [3]	3-80	310.0	79.0	-0-
1	390,770	12-79	138.2	53.5	58
2	81,842	8-80	140.1	65.7	518
16	**880,547**		**$1,168.4**	**$378.5**	**$ 994**
33	**1,479,309**		**$2,018.6**	**$795.6**	**$5,103**

[1] Total contract cost including CDS and National Defense Features (NDF), but excluding engineering and change orders.
[2] Reconstruction.
[3] 125,000 cubic meters.

Key to Ship Types: CN = containership, COT = crude oil tanker, LNG = liquefied natural gas carrier, TB = integrated tug/barge vessel, BBC = breakbulk carrier, RO/RO = roil-on/roll-off vanship, LASH = lighter aboard ship, RRB = self-propelled RO/RO barge, DBC = dry bulk carrier.

M/V CHICAGO, Great Lakes bulk carrier built for American Steamship Co.; launched at Bay Shipbuilding Corp., Sturgeon Bay, Wis., Aug. 2, 1979.

Fisheye lens view of MOBIL ARCTIC under repair in Portland's Dry Dock 4, at 982 feet largest floating dry dock on West Coast. Photo was made at "People's Day" open house May 19, 1979.

Table 2: PRIVATE SHIP CONSTRUCTION CONTRACTS AWARDED IN FY 1979

Owner	Shipbuilder	Type	No. Vessels	Total Deadweight	Est. Completion Date	Total Est. Cost (Millions)
Union Oil Co. of Calif.	National Steel	Product Tankers	3	112,500	1981	$150.0
Ogden Marine, Inc.	Avondale	Product Tankers	2	84,000	1981	100.0
Artemis Marine Co.	Beth. Sp. Pt./ Halter Marine	Tug/Barge	1	47,075	1980	52.6
First Tug/Barge Corp.	Beth. Sp. Pt./ Halter Marine	Tug/Barge	1	47,075	1981	52.6
Oglebay Norton Co.	Bay SB	Great Lakes Bulk Carier	1	62,000	1981	50.0
Goodyear SS Co.	Bay SB	Great Lakes Bulk Carier	1	24,300	1980	25.0
Great Lakes Dredge & Dock Co.	Southern SB	Dredge	1	N.A.	1980	16.0
Corps of Engineers	Sun Ship	Dredge	1	N.A.	1981	65.0
Total Private Contracts—FY 1979			**11**	**376,950**		**$511.2**

Ship Deliveries

Twenty new vessels totaling 1.8 million dwt. were delivered by American shipyards during the fiscal year (see Table 3).

Seven of the FY 1979 deliveries were subsidized:

- The 125,000-cubic-meter LNG carriers EL PASO ARZEW and EL PASO HOWARD BOYD to El Paso Arzew Tanker Co. and El Paso Howard Boyd Tanker Co., respectively, for Algeria/U.S. East Coast services;
- The 390,770-dwt. crude oil carrier U.S.T. ATLANTIC to U.S. Trust Co. of New York, for charter to VLCC I Corp., for worldwide service;
- The 225,000-dwt. crude oil carrier BAY RIDGE to U.S. Trust Co. of New York, for charter to Richmond Tankers, Inc., for worldwide service;
- The 14,600-dwt. containership ARGONAUT to Farrell Lines, for service between the U.S. East Coast, Europe, and the Mediterranean; and
- The 3,000-dwt. heavy-lift cargo ships JOHN HENRY and PAUL BUNYAN to American Heavy Lift Shipping Co., for operation in foreign trade, serving all U.S. coasts including the Great Lakes.

Delivery of these seven vessels brought to 56 the number of subsidized ships contracted for and completed since enactment of the Merchant Marine Act of 1970.

During the fiscal year, U.S. shipyards also delivered the following 13 vessels built without subsidy:

- Three 125,000-cubic-meter LNG carriers, one each to Patriot II, Patriot III, and Patriot V Shipping Corporations, for service between Indonesia and Japan;
- Two 164,000-dwt. crude oil tankers to Exxon Company, USA, 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 118,300-dwt. double-hull crude oil tanker to Shipco (for long-term charter to a subsidiary of Standard Oil Co. of Ohio), for Alaska/U.S. West Coast service;
- Two 62,000-dwt. self-unloading bulk carriers, one each to U.S. Steel Corp. and American Steamship Co., for the Great Lakes trade;
- One 59,000-dwt. self-unloading bulk carrier to National Steel Corp., for the Great Lakes trade;
- One 23,300-dwt. self-unloading bulk carrier to Oglebay Norton Co., for the Great Lakes trade;
- One self-propelled pipelaying vessel, for Santa Fe International; and
- One self-propelled oceangoing hopper dredge, for North American Trailing Co.

Deliveries of merchant vessels by major shipbuilding nations during calendar year 1978 are shown in Table 4.

Title XI Guarantees

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

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

In the event of default by the owner of a vessel financed under Title XI, 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 1979 MarAd conditionally approved Title XI guarantees of $944.8 million covering 401 vessels (see Table 5).

Based on previous Title XI commitments, guarantees were placed on 121 vessels during FY 1979.

As of September 30, 1979, Title XI guarantees in force amounted to nearly $6.4 billion. Pending applications on that date represented potentially about $3 billion in additional guarantees (see Table 6).

The Title XI ceiling throughout the period was $10 billion as previously established by Congress. Of this amount, MarAd was authorized to guarantee $9,750,000,000 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 Merchant Marine Act of 1936. 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 investigation and guarantee fees go into the Federal Ship Financing Fund, which is a Revolving Fund for payment of mortgage defaults.

Only 12 companies have defaulted in the history of the Title XI program.

During FY 1979 the Federal Ship Financing Revolving Fund had net income of $25,581,567.

Table 3: NEW SHIPS DELIVERED FROM U.S. SHIPYARDS DURING FY 1979

Owner*	Builder	Type	Vessels
Subsidized			
El Paso Arzew Tanker Co.	Newport News SB	LNG Carrier	1
El Paso Howard Boyd Tanker Co.	Newport News SB	LNG Carrier	1
U.S. Trust Co. of N.Y. (VLCC I Corp.)	Newport News SB	Crude Oil Tanker	1
U.S. Trust Co. of N.Y. (Richmond Tankers, Inc.)	Seatrain SB	Crude Oil Tanker	1
Farrell Lines	Bath Iron Works	Containership	1
American Heavy Lift SS Co.	Peterson Builders	Heavy Lift Cargo	2
	Total Subsidized Deliveries		**7**
Nonsubsidized			
Patriot II Shipping Corp.	Gen. Dynamics (Quincy)	LNG Carrier	1
Patriot III Shipping Corp.	Gen. Dynamics (Quincy)	LNG Carrier	1
Patriot V Shipping Corp.	Gen. Dynamics (Quincy)	LNG Carrier	1
Exxon Company, USA	Avondale Shipyards	Crude Oil Tankers	2
Gen. Electric Credit Corp. (Shell Oil Co.)	National Steel & SB	Crude Oil Tanker	1
SOHIO Subsidiary	Sun Ship	Crude Oil Tanker	1
U.S. Steel Corp.	Bay Shipbuilding	Bulk Carrier	1
American Steamship Co.	Bay Shipbuilding	Bulk Carrier	1
National Steel Corp.	Amer. Ship Building	Bulk Carrier	1
Oglebay Norton Co.	Bay Shipbuilding	Bulk Carrier	1
Santa Fe International	Todd-Galveston	Pipelaying Vessel	1
North Amer. Trailing Co.	Southern SB	Dredge	1
	Total Nonsubsidized Deliveries		**13**
Total New Ships Delivered FY 1979			**20**

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

Table 4: WORLDWIDE SHIP DELIVERIES—CALENDAR YEAR 1978 (TONNAGE IN THOUSANDS)

Country of Construction	Total All Types No.	Total All Types Deadweight	Combination Pass. & Cargo No.	Combination Pass. & Cargo Deadweight	Freighters No.	Freighters Deadweight	Bulk Carriers No.	Bulk Carriers Deadweight	Tankers No.	Tankers Deadweight
Total	**965**	**23,366.1**	**5**	**11.1**	**603**	**6,957.4**	**227**	**7,838.1**	**130**	**8,559.5**
United States	15	1,459.1	—	—	3	35.2	—	—	12	1,423.9
Brazil	19	746.7	—	—	11	135.9	7	332.3	1	278.5
Denmark	27	535.3	1	2.8	19	167.6	4	158.9	3	205.9
France	22	416.7	2	3.3	16	287.2	—	—	4	126.2
Germany, East	14	220.8	—	—	8	93.3	6	127.5	—	—
Germany, West	67	959.4	—	—	56	784.4	4	66.7	7	108.3
Italy	13	512.7	—	—	4	65.8	4	337.7	5	109.2
Japan	386	8,281.8	1	3.4	218	2,708.0	135	4,479.8	32	1,090.6
Korea, South	37	985.7	—	—	18	303.8	15	317.5	4	364.4
Netherlands	33	412.3	—	—	29	156.2	—	—	4	256.1
Norway	27	349.9	1	1.6	15	159.3	2	7.8	9	181.2
Poland	29	553.8	—	—	21	260.3	6	218.7	2	74.8
Spain	63	1,551.6	—	—	51	438.9	5	225.4	7	887.3
Sweden	18	1,448.5	—	—	9	78.6	5	363.0	4	1,006.9
United Kingdom	48	1,683.1	—	—	29	416.7	12	393.5	7	872.9
U.S.S.R.	24	467.1	—	—	14	82.4	6	168.3	4	216.4
Yugoslavia	12	391.1	—	—	5	68.7	2	125.4	5	197.0
All Others	111	2,390.6	—	—	77	715.1	14	515.6	20	1,159.9

Table 5: SHIP FINANCING GUARANTEES—COMMITMENTS APPROVED IN FY 1979 [1]

Number	Type	Company	Amount Guaranteed
Deepdraft Vessels:			
5	Bulk Carriers	Levingston Falcon Shipping Co.	$ 82,072,500
2	RO/ROs	Waterman Steamship Corp.	57,248,000
2	Bulk Carriers	Interlake Steamship Co.	64,115,625
1	Tanker	First Tug/Barge Corp.	51,852,000
1	Tanker	Artemis Marine Co.	51,104,000
1	Containership	Matson Navigation Co.	64,688,750
3	Cargo	American President Lines, Ltd.	135,000,000
1	RO/RO	Waterman Steamship Corp.	29,670,000
1	Tanker	Fredericksburg Shipping Co.	24,178,000
1	Bulk Carrier	Morse Steamship Co.	34,681,000
1	Tanker	Chas. Kurz & Co., Inc.	24,244,000
19		**Total Deepdraft Vessels**	**$618,853,875**
Other Types:			
Ocean:			
1	Tug	James Griffiths & Sons, Inc.	$ 940,000
1	Barge	James Griffiths & Sons, Inc.	766,000
2	Tugs	Manatee Towing Co.	9,390,000
2	Barges	Manatee Towing Co.	23,110,000
2 [2]	Barges	Allied Barge, Inc.	2,495,000
2	Barges	Hannah Inland Waterways	5,193,000
1	Barge	Morania Barge No. 410 Inc.	2,500,000
1	Tug	Louisiana Marine Tugs Corp.	2,141,000
1	Barge	Bilcon Associates	5,214,000

Table 5: (Continued)

Number	Type	Company	Amount Guaranteed
3	Tugs	Trailer Marine Transport Corp.	6,899,194
4	Barges	Trailer Marine Transport Corp.	29,100,806
18		**Total Ocean**	**$ 87,749,000**
River:			
1	Tug	Canal Barge Co., Inc.	$ 1,541,689
3	Barges	Canal Barge Co., Inc.	806,311
22	Barges	National Marine Service, Inc.	7,500,000
2	Tugs	Tenn-Tom Towing, Inc.	534,000
2	Barges	Tenn-Tom Towing, Inc.	929,000
4	Tugs	American Commercial Lines, Inc.	7,288,500
109	Barges	American Commercial Lines, Inc.	21,361,500
2	Tugs	Coastal Towing, Inc., Houston	1,362,581
8	Barges	Coastal Towing, Inc., Houston	6,013,833
3	Tugs	Parker Towing Co.	1,409,818
33	Barges	Parker Towing Co.	5,306,971
189		**Total River**	**$ 54,054,203**
Drill Service:			
4	Tug/Supply Vessels	Acadian Supply Ships Assoc.	$ 13,633,305
1	Tug/Supply Vessel	Angela Briley, Inc.	2,408,000
1	Tug/Supply Vessel	Briley Offshore, Inc.	2,391,000
1	Tug/Supply Vessel	Mark Briley, Inc.	2,399,000
2	Tug/Supply Vessels	Point Marine, Inc.	4,506,250
2	Tug/Supply Vessels	Offshore Island Boats, Inc.	4,628,750
2	Tug/Supply Vessels	Arthur Levy Enterprises, Inc.	4,628,750
1	Tug/Supply Vessel	Billy Pugh Offshore, Ltd.—1978	1,828,417
1	Crewboat/Ferry	Billy Pugh Offshore, Ltd.—1978	660,394
1	Standby Boat	Billy Pugh Offshore, Ltd.—1978	311,351
1	Tug/Supply Vessel	Billy Pugh Offshore, Ltd.—1979	2,322,029
17		**Total Drill Service**	**$ 39,717,246**
Drill Ships:			
1	Jackup Drill Rig	Western Company of North America	$ 19,500,000
1	Jackup Drill Rig	Southern Marine—A Joint Venture	14,000,000
1	Jackup Drill Rig	Tidelands Ltd. I	11,000,000
1	Jackup Drill Rig	Keyes Offshore Ltd.	12,263,000
1	Jackup Drill Rig	Keyes Offshore Ltd. II	15,826,000
1	Jackup Drill Rig	Broughton Offshore Ltd.	14,200,000
1	Jackup Drill Rig	Houston Offshore Ltd. II	15,407,000
7		**Total Drill Ships**	**$102,196,000**
Miscellaneous:			
1	Self-Propelled Reel Pipelay Ship	Marine Equipment Suppliers, Inc.	$ 29,427,000
1		**Total Miscellaneous**	**$ 29,427,000**

(Continued on page 14)

Table 5: (Continued)

Number	Type	Company	Amount Guaranteed
Lighters:			
150	LASH Lighters	Waterman Steamship Corp.	$ 12,790,000
150		**Total Lighters**	**$ 12,790,000**
401		**Total Guaranteed**	**$944,787,324**

[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 $9.750 Billion) Principal Liability on September 30, 1979

	Contracts in Force		**Applications Pending**	
Vessel Types	Vessels Covered	Principal Amount*	Vessels Covered	Principal Amount*
Deepdraft Vessels:				
Tankers	66	$1,191,557,754	10	$ 470,207,250
Cargoes	165	1,235,755,917	17	316,018,500
LNGs	16	1,387,782,400	17	1,640,849,750
Bulk/OBOs	18	325,329,012	2	35,975,000
Total	**265**	**$4,140,425,083**	**46**	**$2,463,050,500**
Other Types:				
Drill Rigs/Ships	53	$ 749,890,950	16	$ 276,288,000
Tugs/Barges/Drill Service	2,190	1,308,496,227	261	218,257,238
Miscellaneous	8	105,660,947	7	74,426,753
Total	**2,251**	**$2,164,048,124**	**284**	**$ 568,971,991**
TOTAL VESSELS	**2,516**	**$6,304,473,207**	**330**	**$3,032,022,491**
SHIPBOARD LIGHTERS	**1,882**	**$ 72,473,679**	**201**	**$ 10,005,273**
TOTAL	**4,398**	**$6,376,946,886**	**531**	**$3,042,027,764**

* Rounded to the nearest dollar.

Capital Construction Fund

Since the Capital Construction Fund (CCF) Program was established under the Merchant Marine Act of 1970, it 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 cost of ship construction, the CCF is a significant source of capital.

During the fiscal year, $262 million was deposited in these accounts. Since the inception of this program in the fall of 1971, $1.7 billion has been deposited in CCF accounts and $1.3 billion has been withdrawn 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 and include large containerships, tankers, sophisticated LNG vessels, self-loading Great Lakes bulk carriers, integrated tug/barge units, offshore vessels, and barges.

In a significant new development in FY 1979, the Maritime Administration began permitting the use of CCF deposits as collateral for notes used to provide interim financing for ships under construction. This made it possible for operators to issue their own securities (commercial paper) and gave them greater flexibility in corporate finance matters.

The total value of construction projects completed or started by CCF fundholders to date is approximately $5.2 billion. In the future, it is anticipated that the 94 fundholders (listed in Table 7) will contract for over $3.4 billion in construction projects. By operating area, $2.9 billion of construction is projected for vessels employed in the U.S. foreign trade, $371 million for the Great Lakes trade, and $158 million for the noncontiguous domestic trade.

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 1979, CRFs were maintained by 10 companies and balances on deposit totaled approximately $3.6 million. Eight companies deposited a total of $8.4 million during the fiscal year. Of the depositors, three opened new CRFs and two completed their CRF objectives and exhausted their funds. Withdrawals totaled $1.9 million. At the close of the reporting period, 11 companies maintained CRF balances totaling $10.1 million (see Table 8).

Ship Trade-Ins

During fiscal year 1979 three subsidized operators traded in nine vessels against new construction, as provided in Section 510 of the Merchant Marine Act of 1936. Under actions by the Maritime Subsidy Board:

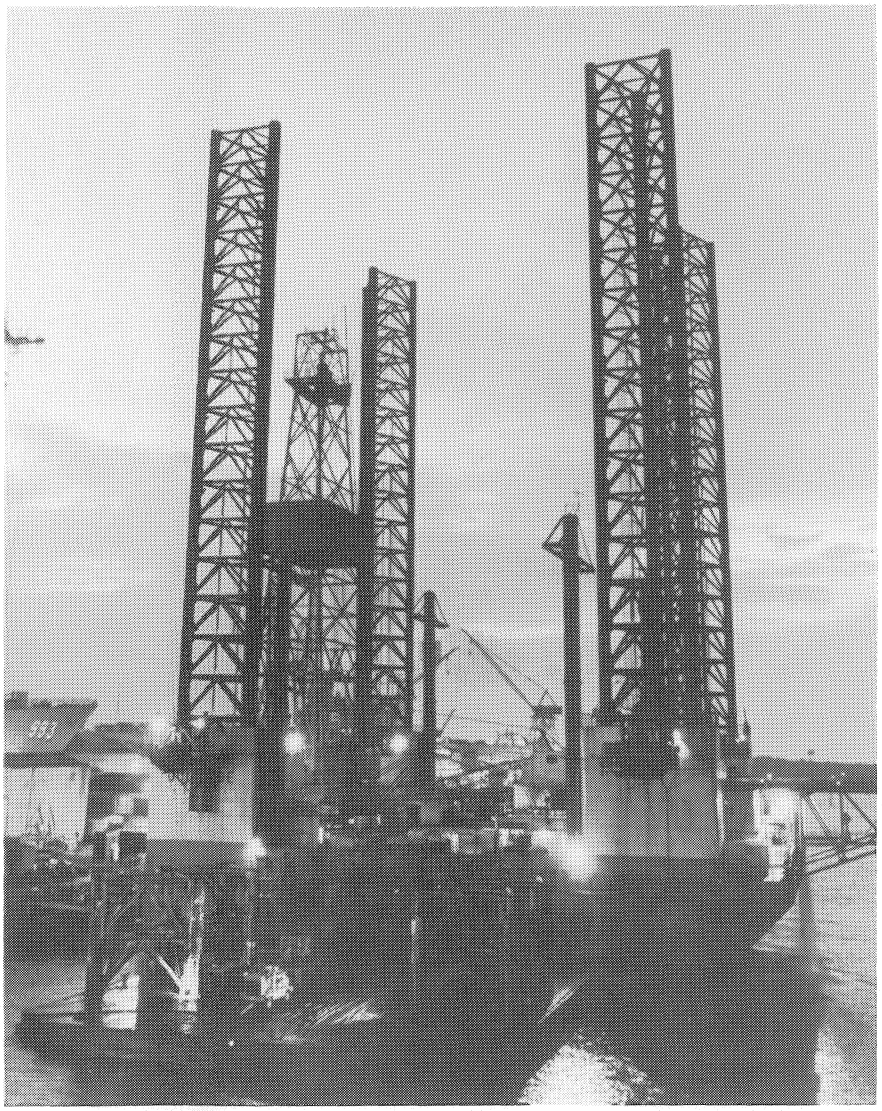
- American President Lines, Ltd., was granted approval for the trade-in of four C6 vessels, the PRESIDENTS LINCOLN, TYLER, MONROE and HARRISON, against the construction of one diesel-propelled containership. (The PRESIDENTS MONROE and HARRISON continued operations under a use-hire agreement.)
- Farrell Lines, Inc., traded in the EXPORT AIDE against the delivery of two new containerships.
- Waterman Steamship Corp., in connection with the award of a 20-year ODS contract on Trade Route 21, traded in the ALEX STEPHENS, ROBERT TOOMBS, THOMAS JEFFERSON, and ARTHUR MIDDLETON against the construction of two RO/RO containerships. (The traded-in vessels remained in operation under a use-hire agreement, pending delivery of the new vessels.)

Table 7: CAPITAL CONSTRUCTION FUND HOLDERS—SEPTEMBER 30, 1979

A & G Transportation Co.
Aeron Marine Shipping Co.
Alaska Aggregate Corp.
Amak Towing Co., Inc.
American President Lines, Ltd.
American Shipping, 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 & Dredge Co.
Bultema Marine Transportation Inc.
Campbell Towing Co.
Cement Transit Co.
Central Gulf Lines, Inc.
Citimarlease (Burmah I), Inc.
Citimarlease (Burmah LNG Carrier), Inc.
Citimarlease (Burmah Liquegas), Inc.
Citimarlease (Fulton), Inc.
Citimarlease (Whitney), Inc.
Cleveland Cliffs Iron Co.
Cook Inlet Tug & Barge Co.
Cove Maritime Companies, 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.
Exxon Company USA
Farrell Lines, Inc.
Ford Motor Co.
Foss Alaska Line, Inc.
Foss Launch & Tug Co.
Fred Devine Diving & Salvage, Inc.
GATX Corp.
General Electric Credit & Leasing Corp.
General Marine, Inc.
Globe Seaways, Inc.
Great Lakes Towing Co.
Hannah Brothers
Hannah Inland Waterways Corp.
Houston Natural Gas Corp.
Hvide Shipping, Inc.
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.
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 Shipping, Inc.
Prince William Navigation Co., Inc.
Prudential Lines, Inc.
R.J. Reynolds Industries, Inc.
Ritchie Transportation Co.
River & Gulf Transportation Co.
S & E Shipping Corp.
Seabulk Tankers Ltd.
Sun Company, Inc.
Tidewater Inc.
Transway International Corp.
TTT, Inc.
Union Oil Company of California
United States Cruises, Inc.
United States Line, Inc.
U.S. Steel Corp.
United Tanker Corp.
Warrior & Gulf Navigation Co.
Washington Island Ferry Line, Inc.
Waterman Steamship Corp.
Western Pioneer Inc.
Worth Oil Transport Co.
Young Brothers, Ltd.
Zidell, Inc.

Table 8: CONSTRUCTION RESERVE FUNDS—SEPTEMBER 30, 1979

Company	Balance
Asphalt Barge Corp.	$ 396,664
Cargo Carriers, Inc.	946,500
Central Gulf Steamship Corp.	1,000
Gulf Mississippi Marine Corp.	100
Intercity Barge Co., Inc.	62,697
Juniper Tankers, Inc.	3,854,445
Keystone Tankship Corp.	423,376
Mobil Oil Corp.	3,283,438
National Marine Service, Inc.	1,143,591
Joan Turecamo, Inc.	3,876
Kathleen Turecamo, Inc.	681
Total September 30, 1979	**$10,116,368**
Net Increase Fiscal Year 1979	**$ 6,560,974**



GULFTIDE oil-drilling rig at Pascagoula, Miss., for modification and repair represents re-entry by Litton Industries' Ingalls Shipbuilding Division into offshore activities.

Ship Design and Engineering

In FY 1979 MarAd sponsored a Government/Industry Mobilization Ship Conference to present to the maritime industry and Department of Defense officials the preliminary design of a modern, standby ship suitable for rapid series construction in the event of a national emergency.

The conference also emphasized the utility of the design for a number of U.S. trades and encouraged its commercial construction.

Following the conference a solicitation was prepared and a contract awarded to prepare the detailed plans and specifications of a "Contract Design Package." Based on comments elicited at the conference, the size of the vessel was increased for this next design phase.

One of the 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 80-ton heavy lifts to be handled. To speed up the load/discharge time and enhance the handling of mechanized military vehicles, sideports and a stern slewing ramp have been incorporated in the design. The design would permit containers to be handled in cells (as on a containership) or the same spaces to be used for RO/RO cargoes.

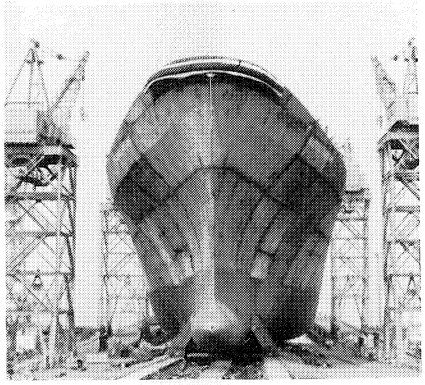
In addition to the base design, there will be eight alternatives utilizing different types of main propulsion machinery and cargo gear. The hull and engine room have been designed to accommodate a range of propulsion plants including steam turbine, gas turbine, medium-speed diesel, and slow-speed diesel.

Optional configurations and features for the multipurpose vessel include a jumbo version derived by inserting a 110-foot midbody into the base ship, use of kingposts and booms or gantry cranes in lieu of standard cranes, and an alternative stern ramp configuraton. All options of the multipurpose ship can carry liquid cargo, including fuel oil, permitting the underway replenishment of naval escort ships.

Also as part of MarAd's continuing effort to provide the United States merchant fleet with national defense capability, the Agency conducted a concept study of an integrated tug/barge as a mobile cargo-handling platform in an amphibious off-loading military operation. The tug would be detached after arrival at the operating site. The barge would be self-elevating to form a pier by jacking caissons down through the hull against the sea bottom.

M/V AMAZONIA, second in series of 2,000-dwt. multipurpose cargo ships built for operation by American Atlantic Shipping, Inc., in Caribbean and South Atlantic trades, is launched at Equitable Shipyards, Madisonville, La., Jan. 20, 1979.

At Todd Shipyards in Galveston, Tex., tugs tow forward half of MORMACALTAIR out of dry dock so that new midbody of jumboized Moore McCormack general cargo ship can be floated in—and all sections connected.



Farrell Lines' AUSTRAL PIONEER (top) passes beneath Chesapeake Bay Bridge, successfully completing official sea trials on Sept. 21, 1979. Largely refrigerated containership was built at Bethlehem Steel Corp., Sparrows Point, Md., shipyard. Sister ship AUSTRAL PURITAN (left), launched at Sparrows Point July 28, 1979, will join AUSTRAL PIONEER in service between U.S. Atlantic and Gulf Coast ports and Australia and New Zealand.

During FY 1979 MarAd provided the following ship-design assistance to other Government agencies:

- In response to a request from the Naval Sea Systems Command (NAVSEA), MarAd began design and cost studies for a fleet oiler for the Navy. The design, designated the T-AO, incorporates underway replenishment capabilities comparable to the Navy's AO177 fleet oiler but has structure, propulsion, and electric power generation designed in accordance with commercial standards and practices. In addition, the T-AO was designed to be manned by a Military Sealift Command crew. MarAd's 6-month design and costing effort includes three baseline and 14 trade-off feasibility level designs from which NAVSEA chose two for a more detailed concept design and cost estimate.
- As technical manager for the National Oceanic and Atmospheric Administration (NOAA) in the procurement of a 127-foot combination crabber-trawler fisheries research vessel, MarAd continued to monitor construction of the vessel at Bender Welding and Machine Co. in Mobile, Ala. MarAd's participation will continue through construction and trials, terminating with delivery which was scheduled early 1980.
- Design work begun in FY 1978 was completed this year on a 90-foot fisheries research shrimp-boat, also for NOAA. When built, the boat will be used by NOAA on the Gulf Coast for stock assessments and hydrographic work. The construction contract will be let under a request for proposal procurement system. Under this system, various boat yards will submit modified stock hulls to MarAd for evaluation. The yard with the most cost-effective design will be selected.
- Work also has begun on the design of a 150-foot NOAA research vessel to be procured under the same system. The vessel will be used for fisheries stock assessments and oceanographic research and will be capable of stern trawling, lining, and crabbing.

In another project, MarAd prepared a comprehensive design for a new training ship which could replace the aging ships now used by the State maritime academies. The design incorporates all features required for practical at-sea training, including two separate and complete main propulsion systems. Also undertaken in FY 1979 was a study of alternative methods of providing merchant marine cadets' shipboard training, including the conversion of existing ships presently in MarAd's custody.

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 also participated in joint computer-aided ship design and ship production projects with the Navy and private industry. The projects entailed: (1) conducting Navy/MarAd ship construction/mobilization studies; (2) adapting Navy ship hull generation/fairing programs to commercial standards; (3) demonstrating specialized computer graphics hardware/software to interested Government and commercial agencies; (4) installing and demonstrating a minicomputer-based, finite-elements, structural analysis program; and (5) using MarAd computer library programs in administering Titles V and XI of the Merchant Marine Act of 1936 and in design studies and projects in support of MarAd programs and similar projects of other Government agencies.

During the year, MarAd also took the following actions pertaining to U.S.-built ships:

- Provided guidance to U.S. equipment manufacturers in the development of a slow-speed diesel engine manufacturing capability and approved plans for slow-speed diesel engines submitted by the U.S. licensees of three major European diesel manufacturers. Following this action, American President Lines directed a U.S. shipyard to proceed with a change in propulsion from steam turbines to slow-speed diesels on three new subsidized containerships ordered earlier in the year.
- Assisted the U.S. Coast Guard in formulating the U.S. position on Automatic Radar Plotting Aids for submission to the Intergovernmental Maritime Consultative Organization (IMCO). MarAd also advised the Coast Guard on the differences between the IMCO Proposed Operation Standards for Automatic Radar Plotting Aids and the MarAd Collision-Avoidance System specifications required by the U.S. Port and Tanker Safety Act of 1978.
- Established a MarAd internal working group through which merchant ship communications policy and planning operations are more effectively coordinated.
- Completed an investigation of the effects of three differing sets of segregated ballast regulations on ship configuration, cost, and anticipated pollution abatement. The regulations studied are the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73); U.S. Coast Guard Regulations published in 1976; and Protocol of 1978 Relating to MARPOL 73, as adopted by the Tanker Safety and Pollution Prevention Conference of 1978. In order to determine the effect of the various regulations, MarAd generated a series of tanker designs which satisfied the requirements and then reviewed these designs from the standpoint of ship configuration, cost, and pollution abatement. In total, 29 new ship designs were developed and compared to each other as well as to existing designs.
- Issued a revised edition of MarAd Standard Specifications for Merchant Ship Construction. One of the purposes of the document is to assist the marine industry in standardizing many aspects of shipbuilding. The specifications expressly prohibit the use of asbestos in merchant ship construction.
- Prepared concept design studies for converting the cargo ships of the bankrupt States Steamship Co. to a more usable configuration. In their present form, the ships are not as marketable as they might be if they were capable of carrying higher revenue cargoes. The concept design series was developed as a marketing tool to show prospective buyers how the ships might be used more profitably.
- Contracted for a study to calculate in detail the radii of gyration for three typical ship types, to improve predictions of ship motions in a seaway. Improved ship motion estimates now are possible for checking the seakeeping characteristics of a vessel.

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 $1,275,000 were achieved in FY 1979. Since the program's inception in 1957, cumulative savings have amounted to $34 million —an average of more than $1.5 million per year.

Shipyard Improvements

Despite a continuing worldwide shipping recession and a climate of uncertainty and overcapacity in global shipbuilding, in this reporting period the U.S. shipbuilding and ship repair industry invested some $208 million in facilities modernization and expansion. As of July 1, 1979, a MarAd survey indicated, the industry collectively planned to spend an additional $221 million to improve facilities during the year ending June 30, 1980.

The Merchant Marine Act of 1970 shifted the emphasis in U.S. shipyard investments from replacement to modernization and expansion. More recently in American yards the emphasis has been on expanded ship repair and conversion facilities.

Under the act, the shipbuilding industry has invested approximately $1.7 billion in facilities modernization and improvements. These have included new building basins and floating drydocks, cranes of unprecedented lifting capacity, automated equipment, and highly mechanized production systems, including the prefabrication of large subassemblies and preoutfitting of components using modular techniques. Through these investments, the industry has significantly increased the capacity, capability, and productivity of the U.S. shipbuilding base.

Tanker ARCO CALIFORNIA under construction (for Atlantic Richfield Company) at National Steel and Shipbuilding Co., San Diego, Calif.

Minority and Women's Business Enterprise Program

In 1974, the Maritime Administration began a Minority Business Enterprise Program to encourage shipbuilding and shipping companies to use minority suppliers and vendors and to advise the minority business community of opportunities for sales to the maritime industry.

During FY 1979 the Agency expanded the program to assist businesses owned by women, as well as those with minority ownership, to become contractors and subcontractors to the recipients of MarAd subsidies.

It is estimated that prior to 1974 less than $1 million per year was transacted by maritime companies with minority entrepreneurs. During the past two reporting periods such transactions averaged approximately $15 million a year.

The Minority and Women's Business Enterprise Program is coordinated with the Minority Business Development Agency, another agency of the Department of Commerce.

In this ongoing effort, MarAd also plays a leading role in Federal Executive Board Minority Programs which are conducted regionally throughout the United States.

Chapter 2

Ship Operations

The U.S. Fleet And Its Cargoes

On September 30, 1979, the U.S.-flag privately owned, deepdraft merchant fleet (including the Great Lakes fleet listed in Table 18) totaled 737 vessels with a record cargo carrying capacity of 23 million deadweight tons (dwt.). In fact, the carrying capacity of the fleet set or equaled new records each month during fiscal year 1979.

This segment of the U.S. fleet included 577 oceangoing vessels of 20 million dwt. (see Table 9), with 526 ships on active status and 51 vessels on inactive status; an average deadweight of 34,662 tons; an average age of 17 years; and an average speed of about 17 knots.

The active oceangoing fleet, totaling approximately 18.7 million dwt., included 112 freighters, 247 tankers, 15 bulk carriers, 132 intermodal vessels (containerships, barge-carrying vessels, and Roll-On/Roll-Off, or RO/RO, vanships), 4 combination passenger/cargo ships, 7 integrated tug/barge vessels, and 9 liquefied natural gas (LNG) tankers.

Matson Navigation Co.'s LURLINE Roll-On/Roll-Off vanship, executes sweeping turn off San Francisco after passing under bridge to Oakland.

Of the 51 vessels in an inactive status, 25 were laid up and 26 were temporarily inactive, either awaiting cargoes or undergoing repairs.

Employment of the U.S.-flag oceangoing merchant fleet as of September 30, 1979, is shown in Table 10.

Compared to other merchant fleets of the world as of December 31, 1978, the privately owned U.S. fleet improved its position from 10th to 9th place on a dwt. basis, and maintained its 11th place rank on the basis of number of ships (see Table 11). In terms of average deadweight tonnage per ship, the U.S.-flag fleet fell from sixth place to seventh.

In calendar year 1978, 18 subsidized American-flag shipping operators reported combined revenues of $1.6 billion and net income from shipping operations of $67 million. Their combined condensed financial statements are presented in Appendix II.

Also in calendar year 1978 based on preliminary data, commercial cargoes carried by ships of all flags in U.S. oceanborne foreign trade reached a record 777 million tons with a record value of $195.8 billion. The dollar value of cargo carried by the U.S.-flag fleet increased, compared to 1977, but the tonnage decreased. In addition, the U.S.-flag fleet's share of both categories declined. Commercial cargoes carried in U.S. oceanborne trade from 1969 through 1978 are shown in Table 12.

Lakes Liner Service

U.S.-flag service between the Great Lakes and overseas areas was maintained by Lykes Bros. Steamship Co. Lykes provided monthly container and breakbulk cargo sailings to the Mediterranean and Black Seas.

Farrell Lines made one sailing from the Great Lakes in May 1979 to ports in West, South, and East Africa; it then discontinued Lakes service for the remainder of the year.

The possibility of increased U.S.-flag liner service was buoyed by the application of Great Lakes Atlantic Steamship Co. (GLAS) for operating-differential subsidy. The company's plans call for an all-water cargo service between U.S. Great Lakes ports and ports in the United Kingdom and Continental Europe during the St. Lawrence Seaway's 8½-month navigation season. During winter months, GLAS would offer an intermodal service via Albany, N.Y., under through bills of lading issued to and from Great Lakes ports. The application was pending at the end of FY 1979.

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 compared to the cost 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, policies instituted in recent years have encouraged the exclusion of subsidy for hull and machinery insurance premiums, maintenance and repairs not compensated by insurance, and protection and indemnity insurance.

All modern cargo vessels, including bulk carriers, that operate in an essential foreign trade are eligible for ODS. Total payments during FY 1979 amounted to $301 million.

Regular, long-term ODS agreements are written for 20 years. Soviet grain ODS agreements and interim ODS agreements (to cover periods during which the renewals of long-term agreements are being processed) are written for up to 1 year.

Subsidy payments during FY 1979 pursuant to these regular ODS agreements totaled $290.5 million, while outlays under the Soviet grain program amounted to just over $10 million.

Table 9: U.S. OCEANGOING MERCHANT MARINE—SEPTEMBER 30, 1979 [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	112	1,552	18	204	130	1,756
Bulk Carriers	15	484	0	0	15	484
Tankers	247	13,084	2	21	249	13,104
Intermodal	132	2,667	1	18	133	2,685
Tug/Barge	7	217	0	0	7	217
LNG	9	627	0	0	9	627
Total Active Fleet	**526**	**18,669**	**26**	**280**	**552**	**18,948**
Inactive Fleet:						
Combo Passenger/Cargo	2	13	62	400	64	413
Freighters	14	181	184	1,961	198	2,142
Bulk Carriers	3	63	0	0	3	63
Tankers	21	881	20	301	41	1,182
Intermodal	9	131	2	22	11	153
Tug/Barge	1	25	0	0	1	25
LNG	1	72	0	0	1	72
Total Inactive Fleet	**51**	**1,366**	**268** [2]	**2,683**	**319**	**4,049**
Total Active and Inactive:						
Combo Passenger/Cargo	6	50	67	437	73	488
Freighters	126	1,734	202	2,164	328	3,898
Bulk Carriers	18	548	0	0	18	548
Tankers	268	13,964	22	322	290	14,286
Intermodal	141	2,798	3	40	144	2,837
Tug/Barge	8	242	0	0	8	242
LNG	10	699	0	0	10	699
Total American Flag	**577**	**20,035**	**294** [3]	**2,963**	**871**	**22,997**

[1] Vessels of 1,000 gross tons and over, excluding privately owned tugs, barges, etc.
[2] Includes 13 vessels in bareboat charter and 16 vessels in custody of other agencies. There are also 7 ships laid-up.
[3] National Defense Reserve Fleet consists of 261 ships, of which 24 are scrap candidates other than NDRF. Excluded are 24 vessels owned by U.S. Navy which are in custody of MarAd's Reserve Fleet.
NOTE: Tonnage figures may not add due to rounding.

On September 30, 1979, 18 operators (7 liner and 11 bulk) held 22 ODS agreements with the Agency (see Table 15), with 177 subsidized vessels under contracts in force as of that date.

ODS accruals (excluding Soviet grain programs) from January 1, 1937, to September 30, 1979, totaled $5,753.4 million; recapture amounted to $238.2 million, leaving a net accrual of $5,515.2 million. Of the net accrual, $5,345.3 million had been paid out, leaving an estimated balance of $169.9 million at the end of the fiscal year.

ODS accruals and expenditures from January 1, 1937, through September 30, 1979, are summarized in Table 13; accruals and outlays by shipping lines for the same period are shown in Table 14; and ODS contracts in force at the end of this fiscal year, in Table 15.

Corporate/Service Changes

Two major rearrangements of corporate structure and/or service involving ODS contractors occurred during the year.

As a result of financial and other difficulties, operations of States Steamship Co. were discontinued when its ODS contract terminated on December 31, 1978. One of States' RO/RO vessels was purchased, and

two others leased by Lykes Bros. Steamship Co., Inc., which also acquired States' service from the U.S. Pacific Coast to the Far East (Trade Route 29).

By action of June 20, 1979, the approval of the Maritime Subsidy Board/Assistant Secretary was granted for a reorganization and merger under which American President Lines, Ltd., became a wholly-owned subsidiary of Natomas Company, in lieu of the former structure whereby 51.20 percent of American President Lines was owned by Natomas Company, 48.47 percent by the Signal Companies, and 0.33 percent by other minority interests. As a result of the reorganization and merger, the Signal Companies became 16.10 percent owners of Natomas Company stock, and other minority interests became 0.4 percent owners.

Curtis Bay tugs work LNG EL PASO HOWARD BOYD at Cove Point, Md.

Contract Awards

Two long-term ODS agreements for liner operations were executed during FY 1979. The new contracts were awarded to Waterman Steamship Corp. and Lykes Bros. Steamship Co., Inc., covering the operation of 4 vessels and 44 vessels, respectively. In addition, four long-term ODS agreements for bulk operations were awarded, one to Equity Carriers, Inc., for the operation of five bulk carriers, and three to the Suwannee River Finance Companies (Suwanee River Finance, Inc., Suwannee River SPA Finance, Inc., and Suwannee River Phosphate Finance, Inc.), for the operation of one integrated tug/barge bulk vessel each. All eight of these bulk carriers are to be built with the aid of construction-differential subsidy (see Chapter 1). Under the new ODS contracts, the operators will provide the following subsidized services:

- Lykes Bros. Steamship Co., Inc.—Service from the U.S. Gulf to Europe, the Far East, South and East Africa, and from the U.S. Pacific Coast to ports in the North and South Pacific areas. The Pacific routes were acquired by Lykes from States Steamship Co. after the latter's bankruptcy at the end of the year.
- Waterman Steamship Corp.—Service from U.S. Gulf ports to Western Europe.
- Equity Carriers, Inc.—Service in worldwide trade. The vessels will be leased from the Levingston Falcon Shipping Companies when delivered in 1980 and 1981.
- Suwannee River Finance Companies—Service in the worldwide trade with primary trade being the carriage of superphosphoric acid from U.S. East Coast ports to the U.S.S.R.

Pending Applications

Two ODS applications from nonsubsidized operators were actively pending on September 30, 1979. By company and services, these included:

- Central Gulf Lines, Inc.—to provide LASH service between U.S. ports and ports in Southwest Asia, Indonesia, Singapore, Brunei, Africa on the Red Sea, the Gulf of Aden, and the Gulf of Aqaba.
- Great Lakes Atlantic Steamship Co.—to provide 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.

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

- American President Lines, Ltd.—for amendment of its ODS agreement so as to increase by 26 the maximum number of sailings permitted on its subsidized Line A, California transpacific service, and to delete certain restrictions on that service.

LYKES Bros. Steamship's TILLIE LYKES, barge-carrying/container vessel, heads down Mississippi in home port of New Orleans.

ARCO ALASKA, 188,500-dwt. tanker built for Atlantic Richfield's Alaskan oil trade at National Steel and Shipbuilding Co., San Diego.

- Farrell Lines, Inc. (American Export Lines Service)—contract renewal for services from U.S. Atlantic and Gulf ports to ports in Western Europe, the Mediterranean Sea, India, the Persian Gulf, Red Sea, and Far East.
- Lykes Bros. Steamship Co., Inc.—for a new long-term contract for services between U.S. Atlantic and Gulf ports and ports in India, the Persian Gulf, Red Sea, and the Mediterranean (Trade Routes 10 and 18). Lykes also has applied for additional service on its newly acquired Trade Route 29.
- Prudential Lines, Inc.—for a new long-term contract for services between U.S. Atlantic and Gulf ports and ports in India, the Persian Gulf, and Red Sea (Trade Route 18).
- Waterman Steamship Corp.—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. Waterman has requested the following privilege service on its Trade Route 18 service: from the Great Lakes to Africa, Red Sea, Persian Gulf, and India; South and East Africa; and Mediterranean Egypt. Waterman has applied for the addition of two or three vessels to provide its existing Trade Route 18 service as well as the additional privilege service requested. Waterman also has applied for a new long-term contract for service between U.S. Atlantic and Gulf ports and Indonesia, Malaysia, and Singapore (Trade Route 17), such service to be provided with two or three additional vessels.

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 were increasing at an annual rate of approximately 17 percent while nonfarm industry wages were increasing by about 6 percent a year. In the 5 years after 1970, U.S. seamen's wages and nonfarm 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 shall be effective. The tentative FY 1979 rates for all subsidized vessels were completed in September 1978. Tentative rates for FY 1980 were completed in September 1979.

In addition, MarAd completed almost all final FY 1976 subsidy rates applicable to liner and passenger vessels in liner service.

In the Soviet Grain program, final rates have been completed for 280 of the 334 subsidized voyages by U.S.-flag vessels since the inception of the program in FY 1973.

Soviet Grain ODS

The United States and the U.S.S.R. signed a 6-year maritime agreement, effective January 1, 1976, which facilitated U.S.-flag participation in bilateral trade between the two nations, including the carriage of grain exports to the Soviet Union. (The U.S.-U.S.S.R. Maritime Agreement is described fully in Chapter 10.)

The current agreement succeeds a 3-year pact signed in October 1972. Since the first agreement was signed, over 59.9 million metric tons of American grain have been purchased by the Soviet Union. During the same period, U.S.-flag ships have carried a total of 12.4 million tons of grain to the Soviet Union.

As of September 30, 1979, 35 operators held short-term ODS agreements covering 56 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 1979 under the special Soviet Grain Agreements totaled $10 million (see Table 13).

These ODS agreements provide that within 1 year after termination of a grain voyage, the operators shall submit their actual subsidized costs to determine the total subsidy due on each voyage completed. As of September 30, 1979, audits of cost submissions had been completed for 294 voyages terminated since the inception of the program, permitting the determination of final subsidy rates and payments to the operators.

Since the program began in FY 1973, operators have accrued $139.9 million in ODS. Of this accrual, $137.3 million has been paid, leaving an estimated unpaid balance of $2.6 million at the end of the fiscal year.

In addition to exporting grain cargoes, these vessels have the capacity 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 agreement calls for the Soviet Union to purchase at least 6 million metric tons of grain a year from U.S. suppliers with the option, within certain guidelines, of increasing these purchases to 8 million metric tons a year. Purchases beyond that level require U.S. Government approval.

Grain Freight Rates

A new U.S.-U.S.S.R. freight rate agreement for U.S.-flag vessels, effective for grain voyages commencing after December 31, 1979, and continuing through December 31, 1980, provides for a charter rate to be determined monthly by multiplying an index ratio by the monthly average charter rate for the U.S. Gulf/Holland/Belgium grain trade, as published in the *Daily Freight Register.*

If the published average charter rate is $20 per long ton or less, the applicable index ratio is 1.9, and if the published average charter rate is above $20, the index ratio is 1.7. The formula also is subject to certain adjustments. In addition, a minimum rate of $25 per long ton was set for voyages by U.S.-flag vessels during calendar year 1980.

Soviet ODS Awards

During FY 1979 one new operator with one ship was awarded a short-term ODS contract under the Soviet Grain Program. Three existing operators with a total of four ships terminated their ODS contracts, and an existing operator withdrew two vessels from the program. A net loss of two operators and five vessels was recorded during FY 1979.

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 purchaser made a 10 percent down payment and was continuing to raise venture capital at the close of FY 1979.

During the fiscal year the firm received an extension of its contractual obligation to pay the balance of the sales price. The purchasers asked for the extension in order to seek favorable legislation relating to the eligibility of subsidy-built passenger ships to operate permanently in the domestic trades. By the end of the period, such legislation had been introduced, but Congress had not completed hearings on the issue.

Two other U.S.-flag passenger ships, the MONTEREY and the MARIPOSA, became available for further employment during the period. The ships—formerly owned by Pacific Far East Line, Inc.—were sold at auction for $2.7 million to World Airways, Inc.; however, the ships had not resumed active service by the end of the year.

On September 30, 1979, 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, operated by Delta Steamship Lines, Inc. The ships offer 22 voyages a year with approximately 100 passenger berths per voyage. The ships depart from the U.S. West Coast and circumnavigate South America.

Limited ocean passenger service for up to 12 passengers per vessel was continued by five U.S.-flag operators: Farrell Lines, Inc.; Moore McCormack Lines, Inc.; Lykes Bros. Steamship Co., Inc.; American President Lines, Ltd.; and Delta Steamship Lines, Inc.

On the inland waterways, two traditionally styled steamboats provided a variety of cruises on the Mississippi and Ohio Rivers.

An extensive ferry system is operated in Alaska. This system provides passenger, vehicle and some freight service, linking the State's ports with one another and with the lower 48 States at Seattle, Wash.

Section 804 Activities

Section 804 of the Merchant Marine Act of 1936, as amended, makes it unlawful 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, without the prior approval of the Secretary of Commerce. The prohibition also applies to any officers, directors, agents, or executives of such an organization.

During FY 1979 the following waivers were granted under Section 804:

- Delta Steamship Lines, Inc.—permitting Delta to act as husbanding agent for United States Refrigerated Lines Co. in U.S. Gulf ports. In addition, Delta was granted permission to act as one-time husbanding agent for the M/T BENGHAZI, an Algerian-flag vessel owned by Caltram of Algeria.
- Prudential Lines, Inc.—permitting PLI to act as chartering agent for Navlomar, a Romanian government agency, in the North American charter market.

One new Section 804 waiver was granted in connection with the transport of grain to the Soviet Union: affiliates of Chas. Kurz & Co., Inc., were permitted to continue to own, charter, and operate foreign-flag vessels.

In addition, previously granted waivers for 34 companies were updated and renewed to allow them continued operation in the special Soviet grain ODS program.

Dry-Bulk Shipping Initiatives

The Maritime Administration's continuing efforts to revitalize the U.S.-flag dry-bulk fleet were bolstered in FY 1979 by President Carter's announcement of proposed legislation to help achieve this important goal. The Agency also released during this period a major study on dry-bulk shipping requirements.

Containership ARGONAUT, built for Farrell Lines at Bath (Maine) Iron Works, is swung about with assist from tug.

As of September 30, 1979, the U.S.-flag dry-bulk fleet included only 18 vessels, 12 of which were over 30 years old.

They carried less than 2 percent of the Nation's dry-bulk cargoes. These cargoes, many of which are strategically and economically vital, comprise about 40 percent of the United States' total oceanborne foreign trade.

On July 20, 1979, the President sent Congressional leaders a report on the findings of his Interagency Task Force on Maritime Policy, including recommendations to modernize and expand the dry-bulk fleet. He also announced at that time that a legislative package developed by MarAd was being transmitted to Congress with his full support.

The proposed legislation is intended to put operators of U.S.-flag dry-bulk vessels on a competitive level with their foreign-flag counterparts in the global bulk charter market. The bill would permit the foreign sale of subsidized U.S.-flag dry-bulk ships after 10 years instead of the present 20 to 25 years; permit subsidized operators of such vessels to have repairs made in foreign shipyards; allow them to receive ODS while also operating foreign-registered ships; and permit them to compete more effectively with foreign-flag vessels in foreign-to-foreign trading.

The Administration's dry-bulk bill—as well as other, related legislation—was still pending at the end of the fiscal year.

In May 1979, MarAd released a seven-volume report on *The Development of a Standardized U.S.-Flag Dry-Bulk Carrier.* The report, prepared under MarAd contract by a team of naval architects, economists and shipbuilders, provided a forecast of dry-bulk shipping activity through the year 2000 and developed vessel requirements designed to make U.S.-flag bulkers competitive in this trade.

International Bulk Trades

Generally depressed freight rates continued to plague the world liquid-bulk trades during this reporting period. While rates did increase, much of the rise was attributable to sharply higher bunker fuel prices. Single voyage rates fluctuated during the year but were approximately at the same level at the end of FY 1979 as they were at the beginning.

The market was hurt severely by the political upheaval in Iran and the subsequent decline in Iranian crude exports. This had a very strong impact on freight rates for very large crude carriers (VLCCs). Industry experts did not expect world tanker supply and demand, especially for VLCCs and ultra-large crude carriers (ULCCs), to reach equilibrium again until the early 1980s. At the end of the fiscal year, handy-sized tankers in the 80,000-dwt. range were the most sought-after type of tanker.

The world dry-bulk trades continued to fare better overall than the liquid-bulk trades. Freight rates continued their upward trend throughout the year. The major bulk trades in coal, metallic ores, and phosphate rock formed a firm foundation for the freight rates. The large volume of grain moving in international trade was due to poor crops in certain areas of the world. This placed upward pressure on dry-bulk freight rates during the reporting period. Increasing fuel costs raised nominal freight rates and eroded profitability.

The number of unemployed tankers and combination carriers declined steadily throughout the period. Worldwide, there were 81 vessels of approximately 10 million dwt. in layup at the end of the reporting period, compared to 327 vessels of 41.1 million dwt. a year earlier.

U.S. trade in major dry-bulk commodities remained substantial. During calendar year 1978, the value of U.S. exports of coal, coke, grains, and crude materials exceeded $29.3 billion, while the volume of imports of metallic ores, another major dry-bulk commodity, exceeded $2.85 billion. Thus the total value of trade in these major commodities exceeded $32 billion.

Economic Analysis

During the year MarAd conducted an analysis of the U.S. offshore support vessel industry, including trade and revenue aspects of applications for Title XI guarantees for mobile oil/gas drilling rigs, offshore support vessels, dredges, and pipelaying or construction vessels. Under this program, beginning in 1972, loan guarantees totaling some $875 million have been granted for 58 drilling rigs.

Foreign Transfers

During the fiscal year the Maritime Administration approved the transfer of 25 ships of 1,000 or more gross tons to foreign firms. Fifteen of these were sold for scrapping abroad (see Table 17).

Permission also was granted for the foreign transfer of 423 vessels of less than 1,000 gross tons during the fiscal year. These included 258 commercial and 165 pleasure craft.

In addition, MarAd approved for charter to aliens 59 U.S.-owned ships of 1,000 or more gross tons and 129 under 1,000 gross tons.

Pursuant to Public Law 89-346 and 46 C.F.R. 221.21-221.30, approval was granted during the year for 52 banks to be retained on the Roster of Approved Trustees. One new bank was approved as trustee, and one request for removal was granted.

During the fiscal year there were 63 sale violations involving privately owned ships, of which 47 were mitigated or settled.

40—21765 Commerce

The Maritime Administration's approval of transfer of vessels of 3,000 or more gross tons to foreign ownership or registry, or both, (whether for operation or scrapping) is subject to the terms and conditions of its current Foreign Transfer Policy (46 C.F.R. 221 Appendix). There are presently 115 vessels subject to these terms and conditions, which run with title to the ship and remain in effect for the period of the remaining economic life of the ship.

As reported during fiscal year 1978, 166 ships were scheduled to be released from the contractual control of MarAd because of the termination, effective September 14, 1978, of the National Emergencies Act. Termination of this act made it no longer necessary for U.S. citizens and domestic corporations to obtain MarAd approval 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. By the end of FY 1979, 99 ships had been released and 67 ships were being processed.

User charges for filing applications for foreign transfers and similar actions totaled $35,291 in this reporting period. This total included $4,200 in fees filed pursuant to MarAd contracts.

Table 10: EMPLOYMENT OF U.S.-FLAG OCEANGOING FLEET—SEPTEMBER 30, 1979 [1]

Status and Area of Employment	Total		Vessel Type					
			Combination Pass./Cargo		Freighters		Tankers	
	No.	Deadweight Tons (000)	No.	Deadweight Tons (000)	No.	Deadweight Tons (000)	No.	Deadweight Tons (000)
Grand Total	**871**	**22,997**	**73**	**488**	**493**	**7,356**	**305**	**15,153**
Active Vessels:	**552**	**18,948**	**9**	**75**	**280**	**4,973**	**263**	**13,900**
Foreign Trade	248	8,066	4	37	189	3,676	55	4,353
Nearby Foreign [2]	46	2,742	—	—	6	100	40	2,642
Great Lakes-Seaway Foreign	3	43	—	—	3	43	—	—
Overseas Foreign	199	5,281	4	37	180	3,533	15	1,711
Foreign to Foreign	28	2,043	—	—	11	173	17	1,870
Domestic Trade	208	7,629	—	—	40	597	168	7,032
Coastwise	122	3,473	—	—	8	120	114	3,353
Intercoastal	15	449	—	—	1	9	14	440
Noncontiguous	71	3,707	—	—	31	468	40	3,239
Other U.S. Agency Operations	68	1,210	5	38	40	527	23	645
MSC Charter	42	930	—	—	21	306	21	624
Bareboat Charter & Other Custody	26	280	5	38	19	221	2	21
Inactive Vessels:	**319**	**4,049**	**64**	**413**	**213**	**2,383**	**42**	**1,253**
Temporarily Inactive	26	800	—	—	8	146	18	654
Laid-Up (Privately Owned)	18	465	2	13	12	154	4	298
Laid-Up (MarAd-Owned/ Pending Disposition)[3]	7	85	1	10	6	75	—	—
National Defense Reserve Fleet [4]	268	2,699	61	390	187	2,008	20	301

[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 1 vessel of Pacific Far East Line, Inc., berthed by NDRF, and 6 vessels of States Steamship Co.

Table 11: MAJOR MERCHANT FLEETS OF THE WORLD—DECEMBER 31, 1978

Country	No. of[1] Ships	Rank by[2] No. Ships	Deadweight Tons	Rank by Deadweight Tonnage
Liberia	2,430	3	153,792,000	1
Japan	1,724	5	59,513,000	2
Greece	2,679	1	56,942,000	3
Norway	875	7	49,676,000	4
United Kingdom	1,229	6	46,752,000	5
Panama	2,169	4	32,529,000	6
U.S.S.R.	2,469	2	21,224,000	7
France	384	—	19,746,000	8
United States (Privately Owned)	584	11	18,982,000	9
Italy	601	9	18,565,000	10
Germany (West)	585	10	14,258,000	11
Spain	501	13	12,657,000	12
Singapore	634	8	12,031,000	13
Sweden	266	—	10,352,000	14
India	366	—	9,116,000	15
All Others [3]	6,931	—	108,300,000	—
Total	**24,427**		**644,300,000**	

[1] Oceangoing merchant ships of 1,000 gross tons and over.
[2] By number of ships, People's Republic of China ranked 12th with 541 vessels aggregating 7,877,000 deadweight tons (dwt.), Cyprus ranked 14th with 486 vessels aggregating 8,106,000 dwt., and the Netherlands ranked 15th with 429 vessels aggregating 7,611,000 dwt.
[3] Includes 295 U.S. Government-owned vessels of 2,944,000 dwt.

Table 12: U.S. OCEANBORNE FOREIGN TRADE/COMMERCIAL CARGO CARRIED
Tonnage (Millions)

Calendar Year	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978*
Total Tons	427.5	473.2	547.4	513.6	631.6	628.9	615.6	698.8	775.3	777.0
U.S.-Flag Tons	19.8	25.2	24.4	23.8	39.9	40.9	31.4	33.8	34.8	31.9
U.S. Percent of Total	4.6	5.3	5.3	4.6	6.3	6.5	5.1	4.8	4.5	4.1
Liner Total Tons	41.9	50.4	44.2	44.6	51.3	51.4	44.3	49.8	47.8	54.6
Liner U.S.-Flag Tons	9.7	11.8	10.1	9.8	13.2	15.3	13.6	15.4	14.4	15.6
Liner U.S. Percent	23.1	23.5	22.9	21.9	25.8	29.8	30.7	30.9	30.2	28.6
Non-Liner Total Tons	212.1	240.7	220.7	242.6	281.9	282.7	275.3	289.6	289.0	313.9
Non-Liner U.S.-Flag Tons	4.6	5.4	4.8	3.8	4.5	5.0	3.8	4.9	5.7	4.9
Non-Liner U.S. Percent	2.2	2.2	2.1	1.6	1.6	1.8	1.4	1.7	2.0	1.6
Tanker Total Tons	173.5	182.1	192.5	226.4	298.4	294.8	296.0	359.4	438.6	408.5
Tanker U.S.-Flag Tons	5.5	8.0	9.5	10.2	22.2	20.5	14.0	13.6	14.6	11.4
Tanker U.S. Percent	3.2	4.4	4.9	4.5	7.4	7.0	4.7	3.8	3.3	2.8
Dollar Value ($ Billions)										
Total Value	41.9	49.7	50.4	60.5	84.0	124.2	127.5	148.4	171.2	195.8
U.S.-Flag Value	8.1	10.3	9.9	11.1	15.9	22.0	22.4	26.4	28.0	30.7
U.S. Percent of Total	19.3	20.7	19.6	18.4	18.9	17.7	17.5	17.8	16.4	15.7
Liner Total Value	27.2	33.5	32.4	37.4	49.6	63.4	64.0	75.8	82.3	99.7
Liner U.S.-Flag Value	7.5	9.7	9.2	10.3	14.4	19.4	20.0	23.9	25.2	28.5
Liner U.S. Percent	27.6	28.8	28.4	27.7	29.1	30.6	31.2	31.6	30.7	28.6
Non-Liner Total Value	11.1	12.2	13.2	17.4	25.2	34.7	36.6	38.2	42.7	52.8
Non-Liner U.S.-Flag Value	.4	.4	.4	.4	.7	.8	1.0	1.1	1.2	1.0
Non-Liner U.S. Percent	3.6	3.3	3.1	2.4	2.5	2.3	2.8	2.8	2.8	1.9
Tanker Total Value	3.6	4.0	4.9	5.7	9.2	26.0	26.9	34.4	46.2	43.3
Tanker U.S.-Flag Value	.2	.2	.3	.4	.8	1.8	1.4	1.4	1.6	1.2
Tanker U.S. Percent	5.6	5.6	5.5	6.2	9.1	6.9	5.1	4.2	3.5	2.8

Note: Includes Government-sponsored cargo; excludes Department of Defense and U.S./Canada translakes cargo.
* Preliminary Data.

Table 13: ODS ACCRUALS AND OUTLAYS—JANUARY 1, 1937, to SEPTEMBER 30, 1979

Calendar Year of Operation	Accruals			Outlays		
	Subsidies	Recapture	Net Subsidy Accrual	In FY 1979	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	-0-	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	203,401,051	(2,821,259)	206,222,310	1,975,000	205,261,360	960,950
1972	192,512,930	-0-	192,512,930	-0-	190,732,158	1,780,772
1973	220,831,202	-0-	220,831,202	(157,150)	219,463,476	1,362,726
1974	228,590,811	-0-	228,590,811	1,856,373	218,554,166	10,036,645
1975	265,498,681	-0-	265,498,681	6,454,310	259,986,728	5,511,953
1976	290,138,703	-0-	290,138,703	11,056,165	271,860,909	18,277,794
1977	311,211,856	-0-	311,211,856	3,106,474	286,256,290	24,955,566
1978	336,216,107	-0-	336,216,107	91,832,157	273,329,963	62,886,144
1979	215,061,310	-0-	215,061,310	174,374,071	174,374,071	40,687,239
Total Regular ODS	$5,753,395,029	$238,186,435	$5,515,208,594	$290,497,400	$5,345,327,468	$169,881,126
Soviet Grain Programs	$ 139,898,598	$ -0-	$ 139,898,598	$ 10,024,283	$ 137,326,138	$ 2,572,460
Total ODS	**$5,893,293,627**	**$238,186,435**	**$5,655,107,192**	**$300,521,683**	**$5,482,653,606**	**$172,453,586**

Table 14: OPERATING-DIFFERENTIAL SUBSIDY ACCRUALS AND OUTLAYS BY LINES—JANUARY 1, 1937, TO SEPTEMBER 30, 1979

Lines	Accruals				
	ODS	Recapture	Net Accrual	ODS Paid	Net Accrued Liability
Aeron Marine Shipping	$ 12,177,477	$ -0-	$ 12,177,477	$ 9,500,745	$ 2,676,732
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]	737,287,139	10,700,587	726,586,552	680,293,073	46,293,479
American Mail Line [3]	160,070,409	7,424,901	152,645,508	150,815,838	1,829,670
American President Lines [3]	718,074,738	17,676,493	700,398,245	683,378,716	17,019,529
American Shipping	4,216,289	-0-	4,216,289	3,227,714	988,575
American Steamship	111,751	-0-	111,751	76,462	35,289
Aquarius Marine Co.	5,254,472	-0-	5,254,472	3,646,076	1,608,396
Aries Marine Shipping	12,859,286	-0-	12,859,286	10,407,474	2,451,812
Atlantic & Caribbean S/N [1]	63,209	45,496	17,713	17,713	-0-
Atlas Marine Co.	4,306,162	-0-	4,306,162	2,901,349	1,404,813
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.	7,803,231	-0-	7,803,231	6,400,036	1,403,195
Delta Steamship Lines	274,958,386	8,185,313	266,773,073	253,067,390	13,705,683
Ecological Shipping Co.	4,194,586	-0-	4,194,586	2,843,232	1,351,354
Farrell Lines	365,058,725	1,855,375	363,203,350	356,051,346	7,152,004
Prudential Lines [4]	563,446,520	24,223,564	539,222,956	533,747,839	5,475,117
Gulf & South American Steamship [5]	34,471,780	5,226,214	29,245,566	29,245,566	-0-
Lykes Bros. Steamship	802,237,385	52,050,599	750,186,786	723,207,981	26,978,805
Margate Shipping	24,938,541	-0-	24,938,541	21,559,326	3,379,215
Moore McCormack Bulk Transport	12,254,451	-0-	12,254,451	10,185,924	2,068,527
Moore McCormack Lines	549,271,683	17,762,445	531,509,238	522,023,491	9,485,747
N.Y. & Cuba Mail Steamship [1]	8,090,108	1,207,331	6,882,777	6,882,777	-0-
Oceanic Steamship [6]	114,749,126	1,171,756	113,577,370	112,775,925	801,445
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	260,823,724	4,694,552
Pacific Shipping Inc.	3,969,846	-0-	3,969,846	3,379,543	590,303
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	230,192,471	5,110,997	225,081,474	219,703,580	5,377,894
U.S. Lines [8]	584,187,406	54,958,689	529,228,717	529,228,717	-0-
Waterman Steamship	134,931,666	-0-	134,931,666	125,813,219	9,118,447
Worth Oil Transport	4,789,172	-0-	4,789,172	3,892,004	897,168
Zapata Products	11,636,113	-0-	11,636,113	8,542,738	3,093,375
Total Regular ODS	$5,753,395,029	$238,186,435	$5,515,208,594	$5,345,327,468	$169,881,126
Soviet Grain Programs [9]	$ 139,898,598	$ -0-	$ 139,898,598	$ 137,326,138	$ 2,572,460
Total ODS	**$5,893,293,627**	**$238,186,435**	**$5,655,107,192**	**$5,482,653,606**	**$172,453,586**

[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] Included 35 subsidized operators as of September 30, 1979.

Table 15: ODS CONTRACTS IN FORCE—SEPTEMBER 30, 1979

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	23	Transpacific Services [1]			
			California/Far East, Line A (TR 29)	50	82	
			California/Far East, Line A Extension (TRs 17, 18, 29)[2] [3]	18	28	
			Washington-Oregon/Far East, Line B (TR 29)	54	80	
			Washington-Oregon/Far East, Line B Extension (TRs 28, 29)[4]	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)	26	Overall maximum not to exceed 77	
			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/Caribbean, East and West Coasts South America, Mexico, Central America (TRs 23, 24, 25)	25	42	
Farrell Lines, Inc. MA/MSB-352	1-01-76 to 12-31-95	15	U.S. Atlantic/South and East Africa (TR 15-A)	20	Overall maximum not to exceed 89 [5]	
			U.S. Atlantic/West Africa (TR 14-1)	20		
			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 (TR 10)	65	95	
			U.S. Atlantic/Far East (TR 12)	20	30	
			U.S. Atlantic/India (TR 18)	18	25	
			U.S. Atlantic/Western Europe (TR 5-7-8-9)	40	55	
Lykes Bros. Steamship Co., Inc. MA/MSB-451	1-01-78 to 12-31-98	44	U.S. Gulf/U.K.-Continent (TR 21)	36	60 [6]	Overall maximum not to exceed 318
			U.S. Gulf/Mediterranean (TR 13)	42	48	
			U.S. Gulf/Far East (TR 22)	36	60 [7] [8]	
			U.S. Gulf/South & East Africa (TR 15-B)	18	24	
			U.S. Gulf/West Coast South America (TR 31)	24	36	
			U.S. West Coast/North Pacific (TR 29)	20		
			U.S. West Coast/South Pacific (TR 17/29)	20	80 [9]	
Moore McCormack Lines, Inc. MA/MSB-338	1-01-75 to 12-31-94	10	U.S. Atlantic/East Coast South America (TR 1)	40	70	
			U.S. Atlantic/South & East Africa (TR 15-A)	13	20	

Table 15: (Continued)

Operator and Contract No.	Contract Duration	Number of Subsidized Ships	Service (Trade Route/Area)	Annual Sailings Minimum	Annual Sailings Maximum
Prudential Lines, Inc. MA/MSB-421	1-01-78 to 12-31-97	3	U.S. North Atlantic/Mediterranean (TR 10)	24	36
Waterman Steamship Corp. MA/MSB-115	6-04-71 to 6-03-91	7	U.S. Atlantic-Gulf/India, Persian Gulf & Red Sea (TR 18)	30	40
Waterman Steamship Corp. MA/MSB-378	10-26-76 to 10-25-96	5	U.S. Atlantic-Gulf/Far East (TRs 12, 22)	10 [10]	18
Waterman Steamship Corp. MA/MSB-450	11-21-78 to 11-20-98	4	U.S. Gulf/Western Europe (TR 21)	24 [11]	35
Total Liner Trades		**156**			

[1] Dual service privileges provide that sailings made by vessels calling at ports on 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 and from U.S. Atlantic ports is on a privilege basis with a maximum of 28 sailings.

[3] Includes required service to Indonesia, Malaysia (except Sarawak and Sabah) and Singapore. Numbers of required sailings are a portion of the required sailings on Line A.

[4] Includes required service to Indonesia, Malaysia and Singapore. Numbers of required sailings are a portion of the required sailings on Line B.

[5] Of the overall maximum of 89 annual sailings on TRs 15-A, 14-1 and 16, no more than 30 may be made on TR 15-A.

[6] To the extent that Seabee vessels are not used on TR 21, sailings may be made with conventional vessels to the extent that two sailings are the equivalent of one Seabee vessel sailing and the maximum shall be 120 sailings annually.

[7] Lykes has the option to enable additional sailings on TRs 22 and 15-B over maximum sailings: on TR 22, 9 additional sailings; on TR 15-B, 5 additional sailings. The overall maximum must not exceed 318 annual sailings.

[8] Subject to the stipulation that a minimum of 12 and a maximum of 30 sailings per annum shall include ports in the following area: Indonesia and Malaysia (including Singapore).

[9] Except on TR 17/29, one sailing by a C7-S-95a in any service of the operator shall count as 1¼ sailings against the contractually required minimums and maximums in such services.

[10] The minimum/maximum requirement of 10/18 sailings per annum is based upon the operation of five C4 Mariners on TRs 12 and 22. The five Mariners are to be replaced by two LASH vessels. The first LASH is scheduled for delivery in May 1980 and the second for delivery in August 1980. Minimum/maximum sailing requirements shall be reduced to 8/12 when the second LASH enters service.

[11] The minimum/maximum requirement of 24/35 sailings per annum is based upon the operation of four C4 vessels on TR 21. The four C4 vessels are to be replaced by two RO/RO container vessels. The first RO/RO container vessel is scheduled for delivery in April 1981 and the second in July 1981. Minimum/maximum sailing requirements shall be reduced to 16/24 when the second RO/RO container vessel enters service.

(Continued on page 38)

Table 15: (Continued)

B. Bulk Trades:

Operator and Contract No.	ODS Agreement: Contract Effective Date	ODS Agreement: Contract Termination Date	Number of Subsidized Ships 9/30/79	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-219	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	07-23-96	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, 1979

Company	Date Approved	Vessels
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
Chas. Kurz & Co., Inc.	12-05-78	CHILBAR
Connecticut Transport	11-24-72	CONNECTICUT
Cove Tankers	10-06-75	COVE EXPLORER
	"	COVE 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
Fredricksburg Shipping	12-16-76	FREDRICKSBURG
Globe Seaways	11-24-72	OVERSEAS ANCHORAGE
Ingram Ocean Systems	04-27-76	MARTHA R. INGRAM/BARGE IOS 3301
Intercontinental Bulktank	12-05-72	OVERSEAS ALASKA
	11-30-77	OVERSEAS ALICE
International Ocean Transport	01-18-73	ALLEGIANCE
	"	BRADFORD ISLAND
	05-03-73	BANNER
James River Transport	03-09-73	JAMES
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	GLACIER BAY
	09-24-75	"
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
Overseas Oil Carriers	11-24-72	OVERSEAS JOYCE
Penn Tanker	01-03-73	OGDEN CHALLENGER
	"	OGDEN CHAMPION

(Continued on page 40)

Table 16: (Continued)

Company	Date Approved	Vessels
Sun Transport	03-21-78	AMERICA SUN
	"	PENNSYLVANIA SUN
	"	TEXAS SUN
Wabash Transport	11-24-72	OGDEN WABASH
Willamette Transport	11-24-72	OGDEN WILLAMETTE

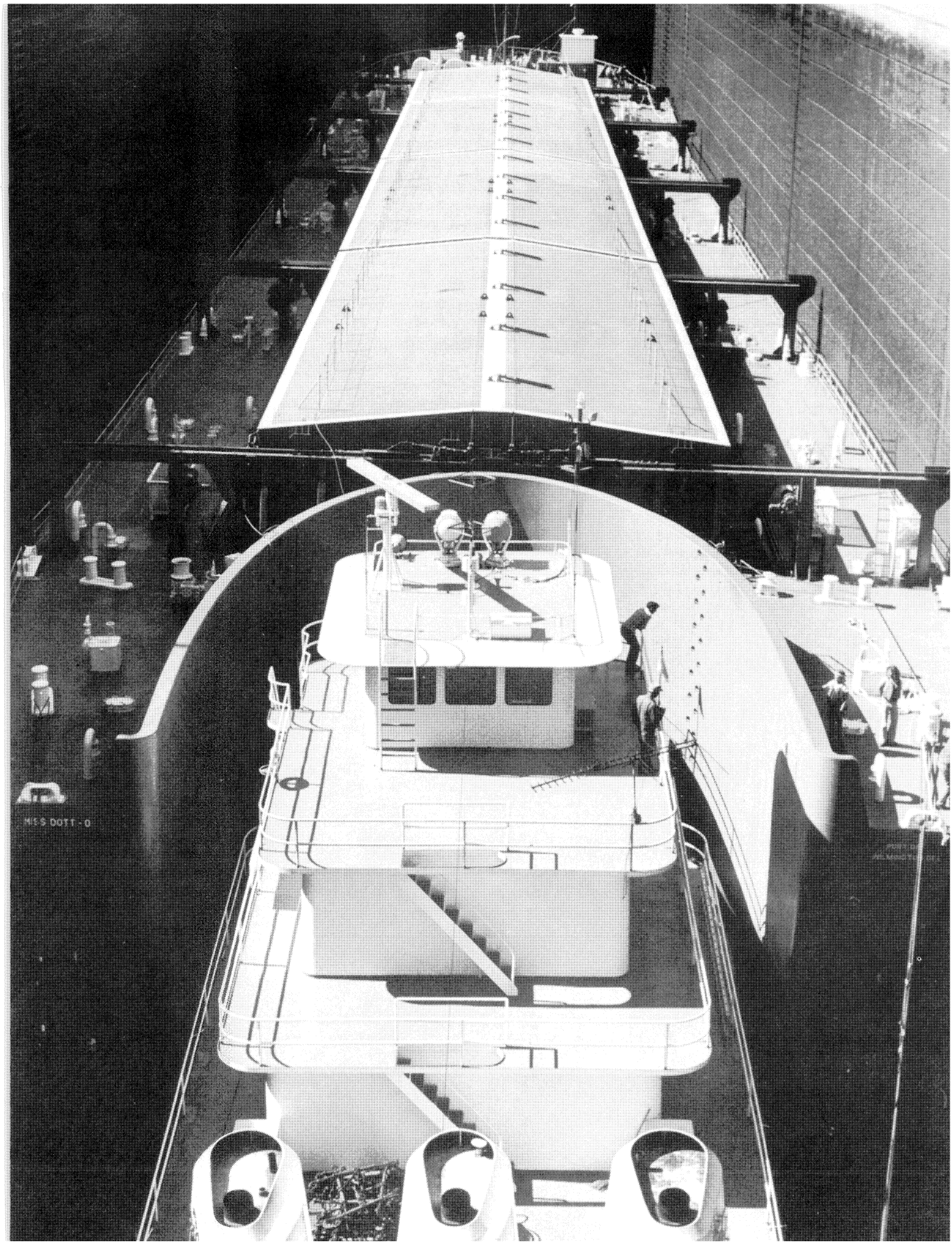
Table 17: FOREIGN TRANSFER APPROVALS—FY 1979

U.S. Privately Owned:

	Pursuant to Section 9 (U.S. owned and U.S. documented)		
	No. of Vessels	Gross Tons	Average Age
Tankers	3	37,722	32.3
Cargo	12	123,222	40.4
Cargo/Passenger	1	14,799	26.0
Miscellaneous	9	20,295	19.0
Total	**25**	**196,038**	**31.0**

Recapitulation By Nationality:	Pursuant to Section 9 Number	Gross Tons
Argentinian	1	1,087
Canadian	1	2,931
Panamanian	6	26,163
Venezuelan	1	1,050
Total	**9**	**31,231**
Sales Alien Only	1	3,863
Sales Alien for Scrap	15	160,944
Total	**16**	**164,807**
Grand Total	**25**	**196,038**

Special decks for cars add carrying capacity to Crowley Maritime/ Trailer Marine Transport's EL CONQUISTADOR, one of four RO/RO barges operated between TMT home ports—Jacksonville and Miami, Fla.—and Puerto Rico. Vessels are world's largest Roll-On/Roll-Off barges.



Chapter 3

Domestic Operations

Domestic operations in America's waterborne commerce include the Great Lakes, the inland waterways, and the noncontinguous ocean, intercoastal, and coastwise trades. Collectively, the domestic segments of the U.S. merchant marine annually transport about one billion tons of cargo.

Great Lakes

At the end of fiscal year 1979, the U.S. Great Lakes fleet numbered 159 vessels, as it had a year earlier. However, its deadweight tonnage increased slightly during the period, to 2.9 million tons (see Table 18). The replacement of obsolete tonnage by two new self-unloading bulk carriers accounted for much of the change. The average age of the fleet is 40 years, but nearly a fourth of its capacity is provided by bulk ships less than 11 years old.

An analysis by the Agency's Great Lakes Region office in FY 1979 confirmed that the trend toward larger ships had created a transportation gap for shippers of relatively small lots of bulk cargoes on the Lakes.

Pushed by tug, MISS DOTT-O locks through Wilson Dam near Florence, Ala., enroute to New Orleans. Seagoing barge, 462 feet long, is operated in Gulf Coast coal trade by Brent Towing Co., Greenville, Miss.; believed to be one of largest vessels ever constructed on U.S. inland waterways. Builder was Ingalls Iron Works, Decatur, Ala.

Through seminars and other discussions with shippers, operators and labor groups, MarAd developed and communicated recommendations for accommodating this segment of the bulk transportation market.

High demand for low-sulfur Western coal continued as a spur to Great Lakes shipping during the fiscal year, with two ships exclusively devoted to its carriage. Barring major disruptions in transportation economics, the number of ships employed in this trade is expected to triple by the middle of the 1980s. However, the longer term impact of Western coal on Great Lakes shipping and building has come into doubt, due to substantial rail rate increases from the mines to Lake Superior, and uncertainty about future Federal environmental policy.

Annual freeze-up of certain portions of the Great Lakes and St. Lawrence River is a recurring problem which inhibits the growth of both domestic and international trades. During the past 9 years, the Maritime Administration served on the Winter Navigation Board, which coordinated a demonstration program involving Federal and State agencies to extend the shipping season.

Through the demonstration program, commercial navigation was successfully extended beyond the historic closing date of December 16 on the upper four Great Lakes and connecting channels during each year of the program. Year-round shipping was achieved during the latter 5 years. As a result more than 41 million tons (approximately 4,000 vessel transits) of various cargoes were shipped through the St. Marys River system. Over half this total was iron ore.

The shipping season on the St. Lawrence River historically extended from mid-April to early December. However, in 1975 the longest commercial season in history was recorded; it opened March 25 and closed December 20.

With the lapse of Congressional authority on September 30, 1979, the demonstration program conducted by the Winter Navigation Board was formally terminated. Individual agencies will continue activities related to the extension of the shipping season, however, with efforts informally coordinated by an Interim Winter Navigation Board composed of a small number of organizations.

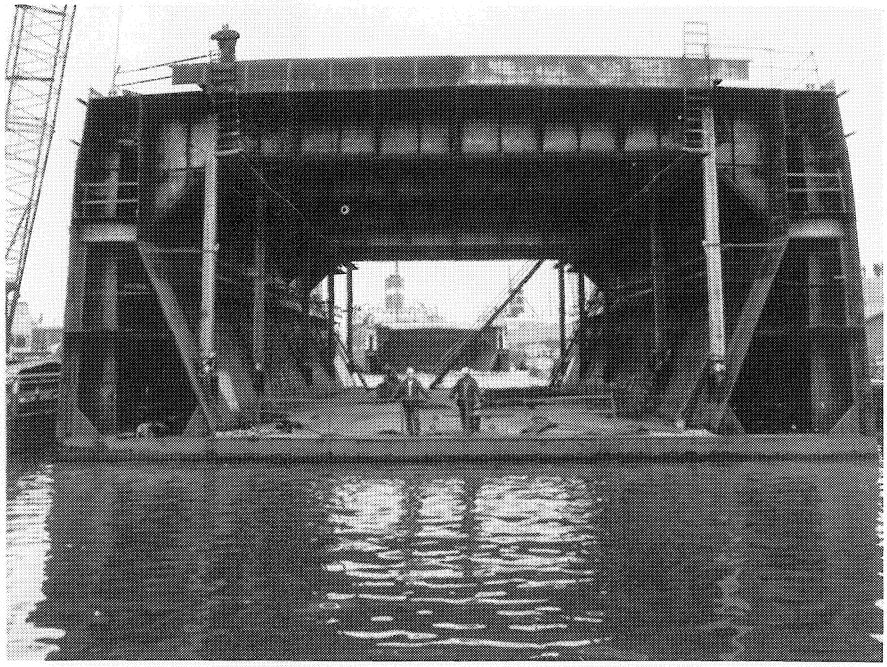
During FY 1979 MarAd continued to assist Great Lakes operators by providing information on the Agency's financial incentive programs, cargo flows, new shipboard equipment, shipboard labor requirements, and new marine technology.

Inland Waterways

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

Topics of major concern in this sector of waterborne transportation during the year included waterway user charge legislation; the construction of a new Lock and Dam 26 at Alton, Ill.; pollution abatement regulation; and vessel traffic-control systems.

Public Law 95-502 (approved October 21, 1978) imposes, for the first time in the Nation's history, a fuel tax on vessels in commercial waterway transportation. The tax, initially 4 cents a gallon, will be imposed beginning October 1, 1980. The tax escalates thereafter, reaching a maximum of 10 cents a gallon after September 30, 1985.



New 120-foot midbody (top) for Great Lakes ore carrier, WILLIAM CLAY FORD (bottom), is floated into dock at Fraser Shipyards, Superior, Wis., where it was fortified with steel beams and welded to bow and stern. Before she was cut in two, vessel was 647 feet long—already largest of five Ford Motor Co. carriers. Jumboizing permits WILLIAM CLAY FORD to carry additional 3,500 tons of taconite pellets each voyage she makes from Duluth, Minn., to Ford's Rouge steel operations in Dearborn, Mich.

Table 18: U.S. GREAT LAKES FLEET [1]—SEPTEMBER 30, 1979

	Vessels	Gross Registered Tons	Estimated Deadweight Tons
Total	**159**	**1,684,121**	**2,983,293**
Bulk Carriers	143	1,611,878	2,942,650
Tankers	6	29,326	40,643
Others	10 [2]	42,917	[3]

[1] Self-propelled vessels of 1,000 gross registered tons and over. (Includes the integrated tug/barge vessel PRESQUE ISLE of 57,500 deadweight tons which, for operations purposes, is considered a self-propelled vessel.)
[2] Includes railroad car ferries, auto ferries.
[3] Not available.

The law also directs the Secretary of Transportation and the Secretary of Commerce to "make a full and complete study with respect to inland waterway user taxes and charges" and orders that a final report, with findings and recommendations, be submitted to the Congress not later than September 30, 1981. In December 1978 the Secretary of Commerce designated the Assistant Secretary for Maritime Affairs to serve as the Commerce co-chairman of the study. For this purpose, a Commerce intra-agency task force was formed to address certain study elements.

Lock and Dam 26 has been a controversial matter for some time. Replacement of the lock and dam on the Mississippi River was approved by the Secretary of the Army in 1969. Congress appropriated funds in 1970 and 1974. Lawsuits filed in August 1974 sought to halt construction for several reasons, including claims that the Corps of Engineers' Environmental Impact Statement was inadequate and that specfiic Congressional authorization was needed. The case came to trial in September 1979; approval of the new construction was granted and contracting for the replacement facility was begun.

Another issue with significant impact on the barge and towing industry is proposed U.S. Coast Guard rulemaking for new and existing tank barges to prevent oil pollution.

In FY 1979 the Maritime Administration supported inland waterway transportation by participating in River Basin Commission studies that included the Upper Mississippi, Allegheny, and Cumberland Rivers and through 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. Assistance also was provided to the Smithsonian Institution in its promotion of the Hall of American Maritime Enterprise.

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 1979, covers statistical data for the years 1973-1977.

In cooperation with the Coast Guard, MarAd participated in a study of the vessel traffic system on the lower Mississippi River. A cost-shared study with industry to determine the cost/benefit ratio of using bow boats as a steering-control system at the head of long tows on the inland waterways was completed during the fiscal year. This analysis indicates that the use of bow boats will lead to a safer and more fuel-efficient operation while increasing marine and environmental safety.

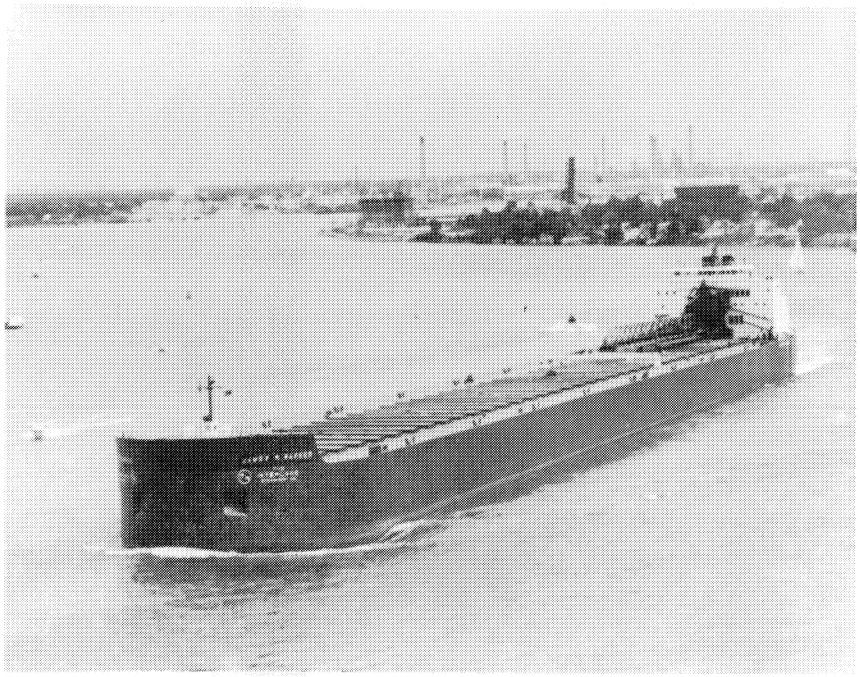
Another study sought to assess the potential impacts of legislation on hazardous substances moving in domestic waterborne commerce. Areas of consideration included limits of liability, penalties and fees, spill-prevention plans, and current practices in the insurance and banking industry.

Domestic Ocean Trades

During the reporting period 229 self-propelled vessels of 7.8-million dwt. operated in the domestic offshore and coastwise trades of the United States. Four new tankers totaling 635,000 dwt. were added to the fleet and joined in the Alaskan oil trade. In the dry cargo intermodal trade, two new triple-deck barges, each capable of carrying 374 40-foot trailers, were added to the U.S.-Puerto Rico service.

Two major areas of operations were the Alaskan and Virgin Islands petroleum trades. During this fiscal year 51 tankers carried 66.2 million long tons of crude oil in 594 voyages from Valdez to various destinations in the lower 48 States compared to 48.6 million tons carried by 32 ships in 466 voyages during FY 1978. In the Virgin Islands trade, U.S.-flag tankers increased their share of the commercial transportation of refined products to the mainland from 13 percent of total tonnage in FY 1978 to 34 percent in FY 1979.

Familiar scene on inland rivers in Eastern half of Nation: conveyor-loading of coal and other bulk cargoes into barges.



Self-unloading bulk carrier, M/V JAMES R. BARKER, is operated on Great Lakes by Interlake Steamship Co.

B. T. SAN DIEGO, named for city in which she was built (at NASSCO), was delivered in FY 1979 to Shell Oil Co. for operation in Alaskan oil trade.

Charter Market Activity

The coastwise and noncontiguous trades continued to dominate the domestic tanker market in FY 1979, with 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 total domestic market.

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. Under Federal regulations operators of these subsidized vessels are required to pay back pro rata construction subsidy for periods of employment in the Alaskan trade.

The "upcoast," U.S. Gulf to U.S. Atlantic Coast, petroleum market showed significant activity in FY 1979, particularly with the fourth quarter's normal increase of 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 existed for independent tanker operators.

Trade Studies

During the reporting period MarAd prepared a projection, through 1985, of U.S.-flag tanker requirements in the Alaskan oil trade and other domestic tanker trades. Despite an expected increase in the throughput of the Trans-Alaska Pipeline System—to 1.5 million barrels per day in late 1979—and the cancellation of a Long Beach, Calif.–Midland, Tex., pipeline project, an adequate supply of U.S.-flag tankers is anticipated. Unsubsidized tankers are projected to be able to satisfy all other domestic tanker trades and just over 90 percent of the Alaskan trade, with vessels built with subsidy available to meet the balance.

Two studies involving the dry cargo containerized trade along the Atlantic Coast of the United States also were conducted in FY 1979. One, developed at the request of the U.S. Department of Agriculture, explored the possibility of transporting agricultural products between Maine and Florida. It concluded that a tug/barge system would be competitive with existing overland transportation. The second report examines overall market trends for the Eastern seaboard, along with ways for water carriers to capture dry cargo containerized shipments. The study found that waterborne transportation has inherent economic advantages when smaller vessels are used in point-to-point service over short sea routes. This area will be the subject of further investigations.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Chapter 4

Market Development

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

- The development and dissemination of market information and cargo data to assist U.S.-flag operators in their own sales efforts.
- Maintaining contact with members of the Nation's international trade community to familiarize them with the benefits resulting from their utilization of U.S.-flag ships.
- Planning and executing—often in conjunction with U.S.-flag operators, trade associations, and other industry groups—marketing programs to improve communications and response between carriers and shippers.
- Conducting statistical and analytical research of waterborne commerce to support the marketing capabilities of the shipping industry and develop Agency policies and initiatives that can help improve the U.S.-flag services to the Nation's importers and exporters.

Heavy-lift mobile crane loads Caterpillar bulldozer aboard ship in Port of Milwaukee, Wis., for delivery overseas.

Marketing Program

In addition to its headquarters Office of Market Development in Washington, D.C., MarAd has marketing representatives in nine strategic locations. In a move designed to increase regional efficiency, one office was closed during the year.

Trade specialists assigned to the four regional and five area marketing offices made contacts during the year with 3,050 transportation policymaking executives of firms engaged in foreign commerce. This and similar activity in recent years has resulted in the issuance of policy directives by 885 companies in support of the Agency's "Ship American" program. Included in this group are 188 of the 928 firms engaged in international trade that are listed in the *Fortune 1000* and the *Forbes 500*.

Voluntary reports from shippers and carriers indicate that during the last 6 years the marketing program has produced $126.5 million in ocean freight revenues for U.S.-flag vessels that otherwise would have gone to foreign carriers.

Also during FY 1979, a new U.S.-flag carrier, American Atlantic Lines, was provided with full services and assistance in identifying markets and establishing business.

MarAd's computerized Shipper Information and Market Lead Systems —designed to enhance the competitive marketing ability of U.S.-flag operators—were widely utilized during the fiscal year.

The Shipper Information System provides trade intelligence on U.S. shippers and their commodities, utilizing a data base built on the marketing contacts and interviews conducted by regional market development trade specialists.

The Market Lead System, with a data base built on market intelligence from sources in the private sector and the Government, identifies and tracks business opportunities for U.S.-flag carriers. The system provided more than 2,400 individual leads to U.S. operators during FY 1979.

During the year MarAd sponsored seminars which brought together U.S.-flag carriers, shippers, and other maritime interests to encourage dialogue which could lead to greater utilization of U.S.-flag vessels. MarAd also participated with other agencies of the Department of Commerce as well as other Federal, State, and local agencies in trade shows, forums, and other programs promoting U.S.-flag shipping.

In addition, articles were prepared for trade journals, foreign trade business reports, and service publications in an effort to carry the "Ship American" message to specialized markets. MarAd also continued liaison with numerous industry trade associations.

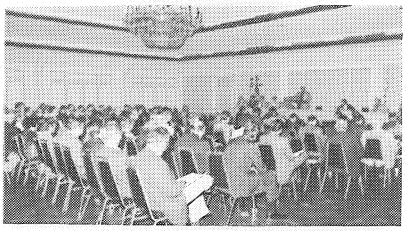
In the highly competitive Pacific Coast-Far East trade, the Agency's Western Region Office worked with the Japanese trading community to gain substantial support for U.S.-flag ships in the carriage of Japanese cargoes.

New Venture Programs

A number of new venture contacts in MarAd's Great Lakes Region resulted in an intensive review of trade opportunities offering potential for new vessel construction. The most promising markets appear to be the dry and liquid bulk trades of the region.

Operator interest continued to grow in the U.S. grain and Canadian ore trades on the St. Lawrence River. Other areas of interest included RO/RO-rail/truck ferries for service across the Great Lakes, liquid fuel barges for the Lake Michigan trade, container feeders to Canadian St. Lawrence ports, and specialized equipment for commodities such as coal and road salt.

Workshops were held in Lansing, Mich.; Chicago, Ill.; and Cleveland, Ohio, to help identify the needs for bulk shippers and to coordinate future Great Lakes trade opportunities for potential marine operators, including tug operations in all types of domestic and Canadian trade.



Shipper conference convenes in Cleveland, Ohio. Meeting was one in series of MarAd-sponsored seminars bringing together U.S.-flag carriers, shippers and other maritime interests in effort to encourage greater use of ships under American flag.

Concrete-mixer is backed aboard Lykes Bros. Steamship's RO/RO CHARLES LYKES.

In support of this program, the Great Lakes Region office prepared two in-house marketing reports.

The first of these, *The U.S. Bulk Vessel Marketing Guide, Great Lakes/St. Lawrence Seaway—Iron Ore—Grain Trade*, analyzed the ore and grain trade between U.S. Great Lakes ports and Canadian St. Lawrence ports. The *Guide* serves as a basic document for new or expanding vessel operators and investors in developing marketing strategies in the U.S.-Canadian St. Lawrence Seaway trade.

The second report, *Tug-Barge Opportunities*, details results of a series of regional workshops held to stimulate the interest of marine operators in small-lot bulk shipments in both U.S. domestic and Canadian trades which serve shallow-draft ports. Workshop recommendations included possible research and development of an optimum design for a self-unloading tug-barge system, improved linkage systems, and improved shipper data for potential bulk, RO/RO, and container trades.

Market Analysis and Planning

The Maritime Administration strengthened its market development program in fiscal year 1979 by consolidating its market analysis and marketing functions in the Office of Market Development. (Market analysis and planning previously had been performed in the Office of Maritime Technology.)

The Agency's principal market analysis activities in this reporting period included assessments of market requirements and opportunities, market economics, market information, and the potential market for ship repairs in U.S. shipyards. MarAd also conducted studies to determine marine transportation requirements and opportunities for trade with developing nations, to define the market for ocean transport of U.S. perishable imports and exports, and to determine the share of marine transportation available to U.S.-flag carriers.

A contract also was awarded to study the market potential for U.S.-flag passenger cruise service.

In the area of market economics, a study was completed on the impact of cargo pooling and bilateral shipping agreements on America's maritime commerce; a study was begun to determine the effects of the terms of sale of imports and exports on U.S.-flag cargo carriage.

During the year also, MarAd and other agencies completed analyses of the inland origin and destination of U.S. foreign trade. This large-scale joint study focused on the method of inland transportation used and the type of packaging employed.

U.S.-U.S.S.R. Bilateral Cargo

Under terms of the U.S.-U.S.S.R. Maritime Agreement, three U.S.-flag liner operators provided direct shipping services to the Soviet Union and two other operators participated in this trade with transshipment services during FY 1979.

In calendar year 1978 U.S.-flag ships carried 171,554 tons while Soviet ships carrred 168,389 tons of the total 400,553 long tons of liner cargo which moved in this trade. The liner cargo volume was the highest for any year since the bilateral agreement became effective in 1972.

The U.S. accountable liner share carryings for 1978 resulted in freight revenues totaling $17,428,797 compared to a Soviet share of $17,783,151.

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.)

To assure that applicable cargo preference statutes are followed, the Maritime Administration monitors the shipping activities of more than 65 Federal agencies, including the Export-Import Bank of the United States (Eximbank) and the Military Assistance Program (MAP) and the Foreign Military Sales Credit (FMS) programs of the Department of Defense (DOD).

Except for the Eximbank, statistics for these programs are maintained on a calendar year basis. Eximbank data are maintained for the life of the loan or guarantee, which extends over several years.

A computer-aided system and a concentrated interagency liaison program permitted MarAd to process 32,506 ocean bills-of-lading for 1978 cargoes covering Eximbank, other civilian agencies, and FMS credit shipments. The equivalent of 10,000 bills-of-lading for MAP and FMS cargoes also were processed by this system through the receipt from DOD of computer tape reels. Total documentation, including bill-of-lading equivalents processed by the computer system, increased by 37 percent over 1977 levels.

U.S.-flag participation in the shipment of P.L. 664 Government-sponsored cargoes during calendar year 1978 is summarized in Table 19. The table reflects an increase in the U.S.-flag revenue of 50 percent and U.S.-flag tonnage of 112 percent over 1977 levels. The increases were partially attributable to program increases, particularly the Strategic Petroleum Reserve program, and to MarAd's increased surveillance and monitoring activities.

The first major movements of cargoes generated by domestic Federal grant programs encompassed by cargo preference laws occurred in 1978. The movements involved foreign-manufactured municipal buses financed in part by the Department of Transportation's (DOT's) Urban Mass Transportation Administration. Substantial U.S.-flag revenues are anticipated for succeeding years through cargoes generated by the grant programs of DOT and other Federal agencies.

Because sufficient U.S.-flag ships were not available, American-flag participation was less than 50 percent in three programs—AID, Loans and Grants; U.S.D.A., P.L. 480, Title I; and the Bonneville Power Administration. If U.S.-flag ships had been available, all these programs would have exceeded the minimum percentage required by the law.

Strategic Petroleum Reserve

Under the Department of Energy's (DOE's) Strategic Petroleum Reserve (SPR) program, the Government planned to store 750 million barrels of crude oil in salt domes along the U.S. Gulf Coast. At the end of calendar year 1978, 68.5 million barrels of crude oil had been stored at three SPR underground sites.

The Cargo Preference Act requires DOE to transport at least 50 percent of the oil in U.S.-flag tankers. In 1977 MarAd and DOE agreed that long ton/miles (not tonnage alone) more accurately determines equitability and compliance with the act. Long ton/miles reflect both the tonnage loaded and the revenue derived by the vessel since revenue is proportionate to the distance traveled and tons carried by the tanker.

During calendar year 1978—the first full year of SPR operations—total program tonnage increased fivefold over 1977 levels. Also during 1978, U.S.-flag tankers carried 4.8 million long tons (63 percent of the total) which resulted in 50.5 billion ton miles (54 percent), and their operators received $53.4 million in revenue (74 percent).

Department of Defense

Under the Department of Defense's Foreign Military Sales Credit program in 1978, both total tonnage and freight revenue levels increased from 1977 levels. This gain was primarily due to increased delivery of equipment and a general growth in the program size. U.S.-flag tonnage participation increased from 65 to 72 percent and accounted for $23.7 million in revenue, a 45 percent increase over 1977 revenues.

In 1978, the Military Assistance Program, which is handled by the Military Sealift Command, also experienced increases in both tonnage and revenue compared to 1977. U.S.-flag participation rose to 91 percent and generated over $2.1 million in freight revenue.

Export-Import Bank

Public Resolution 17, 73rd Congress, (P.R. 17) requires all cargoes generated by Eximbank to be shipped on U.S.-flag vessels unless a 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 Eximbank loans, provided that U.S.-flag carriers are not subject to discrimination in trade with that nation.

Eximbank's 1978 disbursements declined to $1.2 billion from $1.7 billion in calendar year 1977 and resulted in reduced tonnage. Based on a revised reporting procedure which became operational during 1979 and utilizes MarAd's new computer-aided system, Eximbank's ocean revenue in 1978 amounted to $79.3 million. U.S.-flag revenue amounted to $59.1 million or 74.5 percent of the total, compared to $138.5 million (83 percent) in 1977.

Table 19: GOVERNMENT-SPONSORED CARGOES—CALENDAR YEAR 1978 [1]

Public Law 664 Cargoes:

Shipper	U.S.-Flag Revenue ($1,000)	Total Metric Tons	U.S.-Flag Metric Tons	Percentage U.S.-Flag Tonnage
Action	35	51	40	80
Agency for International Development:				
Loans and Grants	76,308	3,352,989	969,000	29 [2]
P.L. 480—Title I	90,405	1,400,936	865,400	62
Department of Agriculture:				
P.L. 480—Title I	140,694	4,678,426	2,210,649	47 [2]
Other Agriculture Programs	75	95	113	84
Department of Commerce:				
Industry and Trade Administration	65	129	108	84
U.S. Travel Service	64	263	193	73
Other	4	16	8	50
Department of Defense:				
Military Assistance Program	2,166	4,834	4,383	91
Foreign Military Sales Credit	23,706	109,089	78,303	72
Department of Energy:				
Bonneville Power Administration	269	6,249	3,077	49 [2]
Strategic Petroleum Reserve	53,414	7,860,485	4,922,822	63
Other Energy Agencies	[5]	*	*	
Department of Health, Education and Welfare	18	43	36	83
Inter-American Development Bank	[4]	25,901	13,900	53
International Communications Agency (formerly U.S. Information Agency)	1,354	4,055	3,675	90
Department of the Interior				
Bureau of Reclamation	392	1,870	1,300	69
Other Agencies	16	34	26	76
Department of Justice	63	87	79	90
National Aeronautics and Space Administration	125	271	233	86
Smithsonian Institution	12	52	39	75
Department of State:				
Sinai Support Mission	79	76	76	100
Foreign Buildings Office	175	241	191	78
Other Agencies (does not include AID)	5,495	9,044	6,604	73
Department of Transportation:				
Federal Aviation Administration	33	31	27	87
Urban Mass Transportation Administration	808	7,584	2,031	26 [3]
Other Agencies	[5]	*	[6]	

Table 19: (Continued)

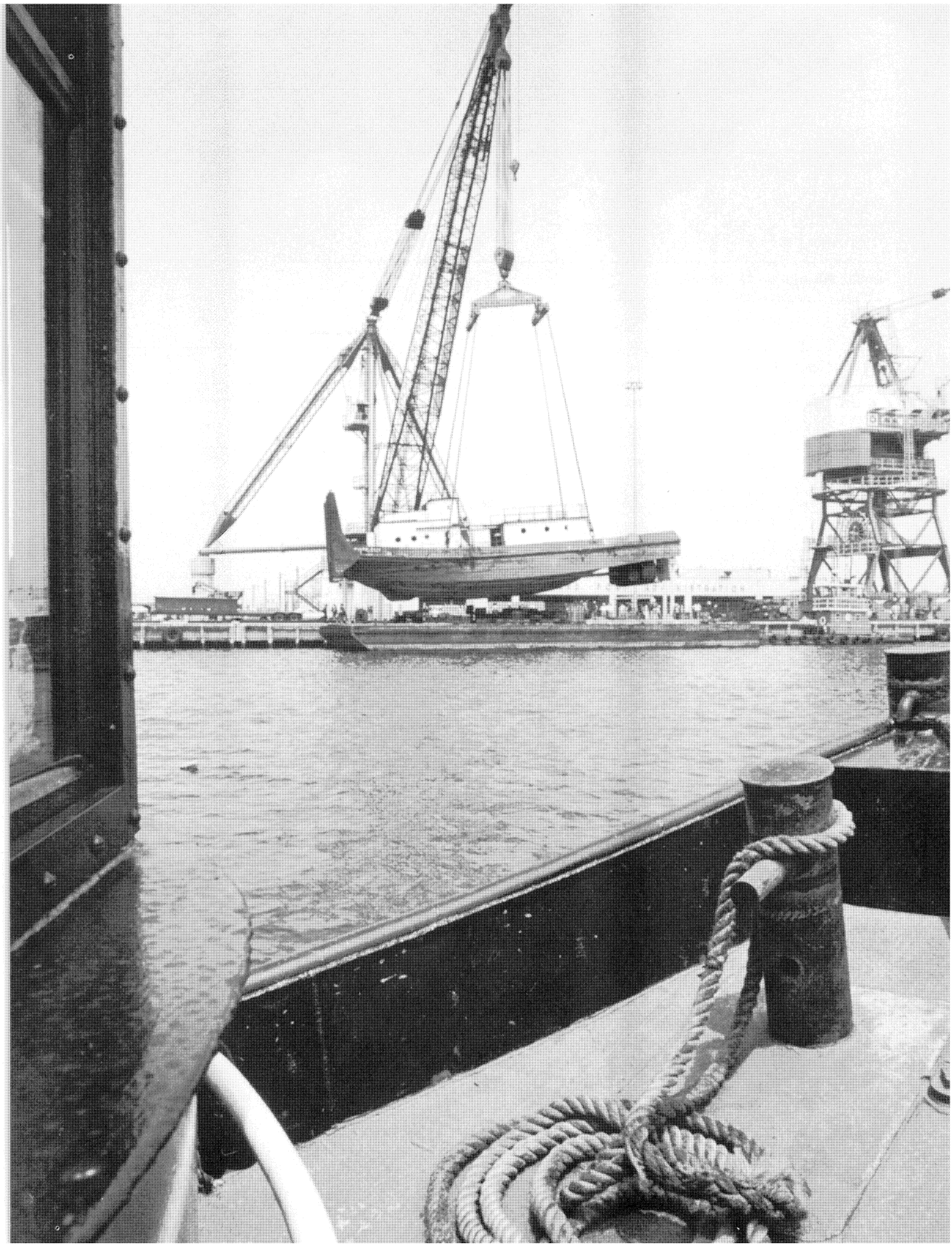
Shipper	U.S.-Flag Revenue ($1,000)	Total Metric Tons	U.S.-Flag Metric Tons	Percentage U.S.-Flag Tonnage
Tennessee Valley Authority	1,997	11,442	9,162	80
Department of the Treasury	9	9	9	50
Other Agencies [6]	17	32	22	69

Public Resolution 17 Cargoes:

	Total Freight Revenue	U.S.-Flag Freight Revenue	Percentage U.S.-Flag
Export-Import Bank	$79,338,193	$59,117,901	74.5

[1] Civilian agencies plus Department of Defense Foreign Military Sales Credit Program and Military Assistance Program (other Department of Defense cargoes not included).
[2] These agencies were below the required 50 percent participation due to the nonavailability of U.S.-flag services as provided in P.L. 664.
[3] Urban Mass Transportation Administration did not obtain the required 50 percent participation because of the use of Soviet-flag vessels by the freight forwarders of their grantees' contractors.
[4] U.S.-flag revenue not available.
[5] U.S.-flag revenue reported was less than $100.
[6] Cargoes of agencies which generated less than 100 metric tons of cargo per year.
* Indicates less than one ton carried.

Tanker discharges cargo at Louisiana receiving terminal, providing temporary storage of crude oil for Government's Strategic Petroleum Reserve (SPR). Oil is piped inland to salt caverns for strategic storage. Federal Cargo Preference Act requires that at least 50 percent of SPR oil be carried in U.S.-flag vessels.



Chapter 5

Port and Intermodal Development

During fiscal year 1979 the Maritime Administration continued its coordination of national, regional, State, and local efforts to support the American port industry and foster the development of intermodal transportation.

Port studies completed or underway during the reporting period dealt with port 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, and assessments, and facility and cargo protection.

Increased emphasis was placed on cost-sharing in port studies and technical assistance programs.

In addition, MarAd increased participation in port-related intergovernmental activities.

Through its regional offices, MarAd serves as a technical consultant on port projects administered by the Economic Development Administration (EDA), also an Agency in the Department of Commerce. EDA grants and loans for port-related projects have exceeded $288 million since 1965.

MarAd also provides technical assistance to the Office of Coastal Zone Management (OCZM) in the National Oceanic and Atmospheric Administration, another Agency of the Department of Commerce. During FY 1979 MarAd and OCZM jointly sponsored a National Conference on Ports and Coastal Management to familiarize coastal zone managers with port development issues and port managers with coastal zone management programs and issues.

FY 1979 marked the establishment of the interagency "Urban Waterfront Action Group," of which MarAd is a member. The group includes most Federal agencies and public interest organizations whose activities are related to urban waterfront development, among them EDA, OCZM, the National Endowment for the Arts, the Department of Housing and Urban Development, Environmental Protection Agency, U.S. Army Corps of Engineers, and the National Trust for Historic Preservation. The basic aim of the group is to coordinate Federal activities related to such projects.

MarAd continued to play a key role in the Commerce/Cities Program which was initiated in FY 1978 as part of President Carter's urban policy to enhance local economic development. The program provides a comprehensive approach to the Department of Commerce's support of local investment strategies.

In each of the selected cities, local officials, leaders in the private sector, and representatives of Agencies in the Department 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 has been provided in several cities. International Shipper Forums were sponsored by MarAd, the Industry and Trade Administration, and local hosts under this program in Long Beach, Calif.; Denver, Colo.; Fort Worth, Tex.; St. Louis, Mo.; Detroit, Mich.; Hartford, Conn.; Greenville, S.C.; and Miami, Fla., during FY 1979. A port planning study is scheduled to be conducted in Detroit in FY 1980.

On the international level in this reporting period, MarAd organized and conducted a seminar on Port Safety and Security in Guayaquil, Ecuador, at the request of the Organization of American States.

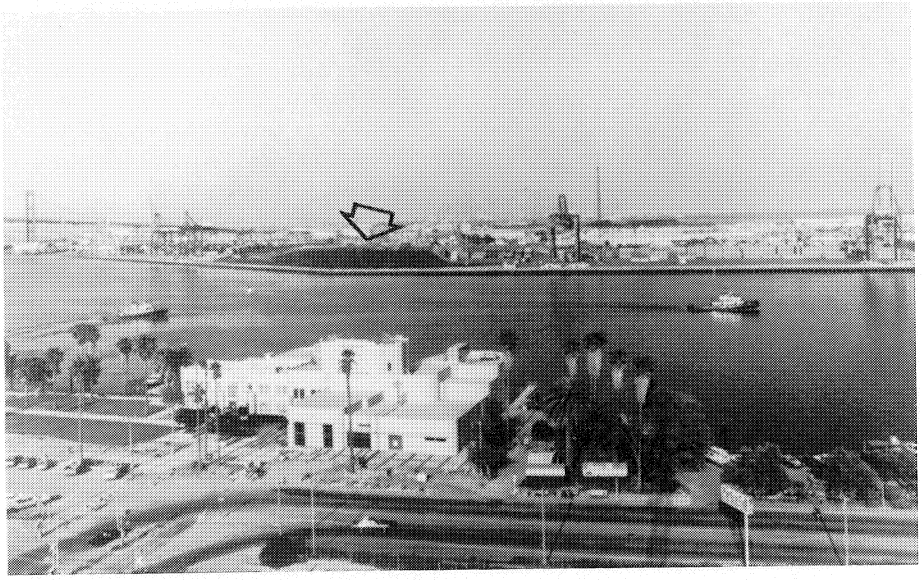
Port Planning

In FY 1979 the Maritime Administration further expanded its program of sharing the costs and actively participating in master planning initiated by regional port associations and State agencies. Two of these studies, which estimate future cargo movements and then match port facility requirements with these needs, were completed during the year. Eight others were underway and six were in the planning stage. Altogether these projects encompass plans for all or parts of 36 states.

The *Mid-America Ports Study*, completed in FY 1979, is the most ambitious regional study to date. The study encompassed all or part of 17 States—Alabama, Arkansas, Illinois, Iowa, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Nebraska, Ohio, Oklahoma, Pennsylvania, Tennessee, West Virginia and

'Baltimore 350' demonstrates its (350-ton) lift capacity. Shore-based, stiff-leg derrick, built by Maryland Port Administration for lease on hourly basis, has reach of 99 feet off bulkhead; is largest heavy-lift crane in Baltimore area.

CAPE ROMAIN, first of new class of harbor tugs, delivered to Curtis Bay Towing Co. by McDermott Shipyards, Morgan City, La., in 1979.



Huge Seaside Container Terminal Complex takes shape in Port of Los Angeles. Size of $21-million project on Terminal Island was increased by 10 acres by filling in Slip 232 (see arrow).

Wisconsin. Predicting that cargo tonnage on inland waterways in these 17 States will double by the year 2000, the study calls for some $9.5 billion in new port facilities to handle the increased tonnage.

The Florida Waterport Study, sponsored by the Maritime Administration in conjunction with the Florida Department of Transportation and the Florida Ports Council, was also completed in FY 1979. The study identified and assessed the problems and needs associated with the development of Florida's waterport system. It embraces some areas not previously covered in these studies, including environmental analysis and port information systems.

In previous fiscal years, cooperative port plans were completed by the Washington (State) Publc Ports Association and the Port of Portland, Ore.; Northern California Ports and Terminals (San Francisco Bay); and the East-West Gateway Coordinating Council, which developed a primer on inland waterway ports through a study of the Port of St. Louis, Mo.

The Great Lakes Cooperative Port Planning Study, scheduled for completion in early 1980, will include the development of port marketing strategies and a comprehensive cargo data system.

The third in a series of Great Lakes Port Development and Shipper Conferences was held in Milwaukee, Wis., in June 1979 to evaluate the direction of programs and priorities of a 5-year effort by the Maritime Administration to improve waterborne commerce on the Great Lakes-St. Lawrence Seaway System.

One of the conference's top priorities, a proposed Great Lakes Marketing Corp. (GLMC) to promote the Fourth Seacoast as a commercial entity, was advanced at Milwaukee. The GLMC concept was originated at the first Great Lakes Port and Shipper Conference in Dearborn, Mich., in the spring of 1976 and was reaffirmed at the Cleveland review session of the Port and Shipper Conference in the fall of 1977.

Based on recommendations at the Milwaukee meeting, the Great Lakes Commission assumed the role of coordinator for organizing the GLMC. A grant has been provided by the St. Lawrence Seaway Development Corp. to finance this initial effort. Additional funding may be provided by other Federal agencies.

MarAd's Great Lakes Region has assisted the Great Lakes Commission with the initial planning of the corporation and will continue its efforts until it is operational.

Work continued in FY 1979 on the Alaska Port Planning Study, undertaken in FY 1978 to evaluate marine transportation in Western and Arctic Alaska. In addition, the Agency initiated Phase II of the Hawaii Port Planning Study, begun in 1978. This ongoing study seeks to define existing and potential cargo flows of all types in domestic and foreign commerce to and from Hawaiian ports.

Work also continued on Phase II of the San Francisco Bay Port Planning Study, which was initiated in FY 1978 to provide specific regional and port impact statements of marine terminal development at selected bay shoreline areas. Other studies are underway to identify port needs in Oregon, Texas, Maryland, and Virginia.

In the planning stage are cooperative undertakings involving ports in New England, New York, New Jersey, South Carolina, North Carolina, and the Delaware River area, plus an update of the Washington State port plan.

MarAd contractual and staff port studies completed or underway for FY 1979 included:

- *National Port Assessment*—an evaluation of regional port system capacities, cargo demands, and overall port facility needs.
- *U.S. Port Development Expenditure Survey*—An update of earlier reports containing historical data since 1946; includes information on capital expenditures made by U.S. ports for the years 1973 to 1978 with projections for 1979-83.
- *Public Port Liability Insurance Study*—an investigation of alternative methods of acquiring liability insurance for public ports at reasonable costs.
- *Local Port Economic Impact Methodology*—a standard set of procedures, published as the *Port Economic Impact Kit*, for use by local communities or port authorities in preparing their own economic statements at minimal expense.
- *Regional Input-Output Port Impact Prototype*—the development and application of a computer technique to estimate regional port economic impacts; applicaabe in any port area of the country.
- *National Trade/Vessel Data Analysis Report*—a comprehensive time-series of U.S. oceanborne trade statistics.

- *Emergency Berth Utilization Reporting System (Phase II)*—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.
- *Port Development Programming and Financing Methods and Sources of Implementation*—an in-house study to determine the current methods used by Great Lakes ports in obtaining financing for capital-investment programs.

Equipment and Facilities Program

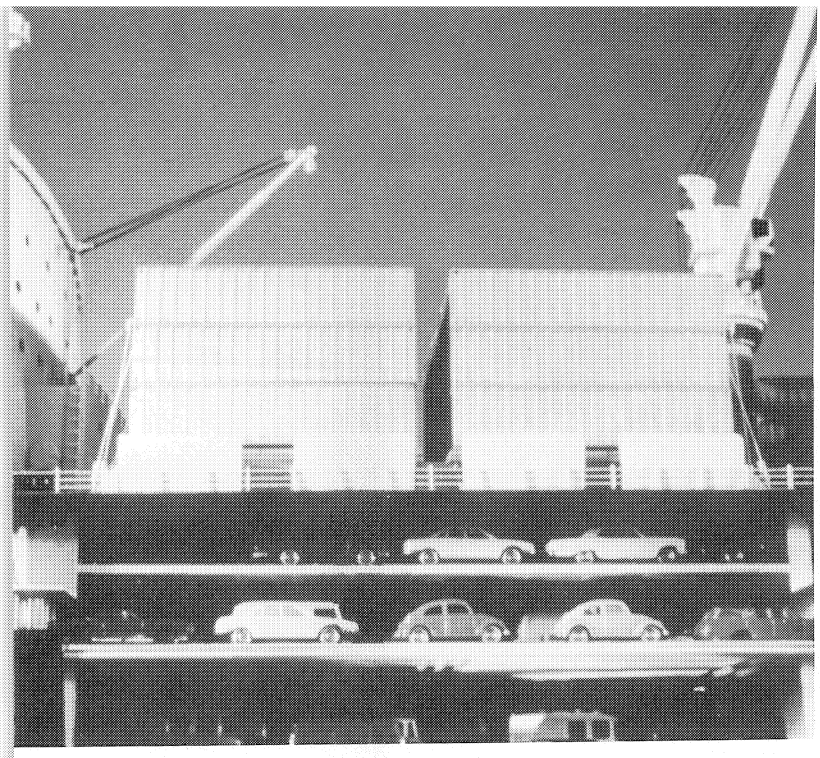
MarAd also helps American port authorities and terminal operators develop equipment and facilities which increase their competitiveness. This technical assistance is designed to reduce costs in the port segment of ocean and domestic waterborne transportation. As in port planning, MarAd shares program costs with others, including industry.

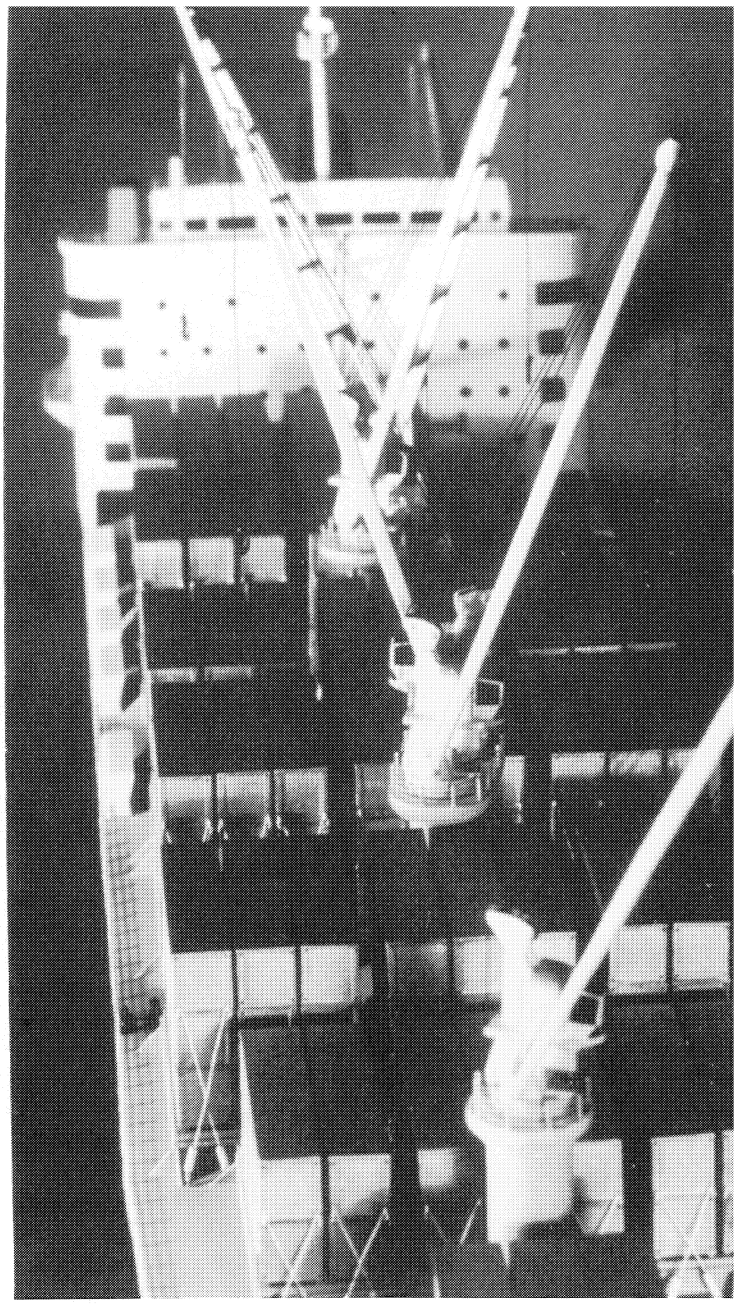
Major projects completed or underway in this reporting period included: U.S. Imports via Minibridge—development of a quantitative data base for minibridge imports; Marine Terminal Automated Management System—demonstration of a computerized system to expedite movement of containers through a public terminal; Port Emergency Planning—development of emergency standby contracts; and Electronic Data Interchange—public marine terminal requirements for intermodal communications.

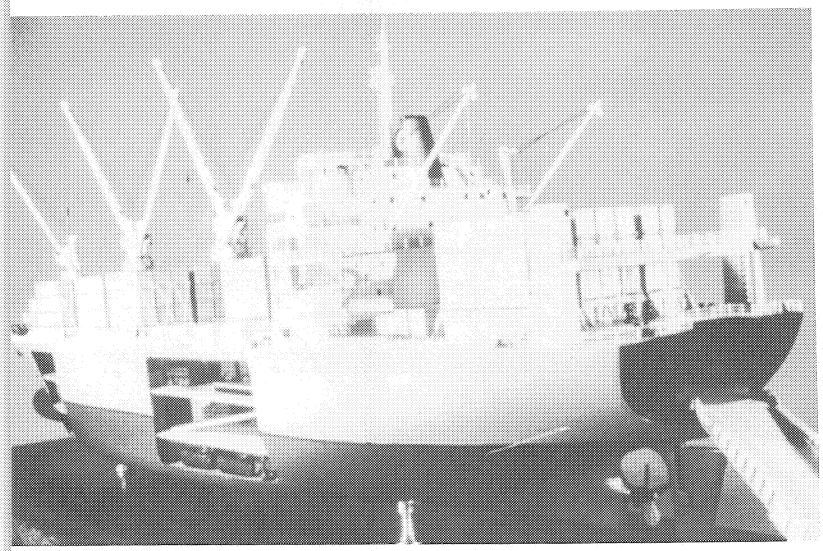
Among other MarAd projects in this area were a Vessel In-Port Locator Demonstration Conference—a meeting regarding a computerized information system to coordinate in-port operations of vessels; Improved Productivity for Bulk Facilities in the Great Lakes Area—an assessment of costs and benefits for alternative means of upgrading or constructing bulk facilities; Tanker Berthing Evaluation—a comparison of alternative tug types and docking techniques through full-scale tests and simulations; Terminal Facility Guidelines for RO/RO Service—specifications and unit-cost estimates for RO/RO terminal construction; Improved Port Fendering Systems—development and publication of design specifications and cost estimates for improved pier fendering; and Tug Fire-Fighting Module—demonstration of a portable equipment system to enable tugs to be used as auxiliary fireboats in a fire emergency.

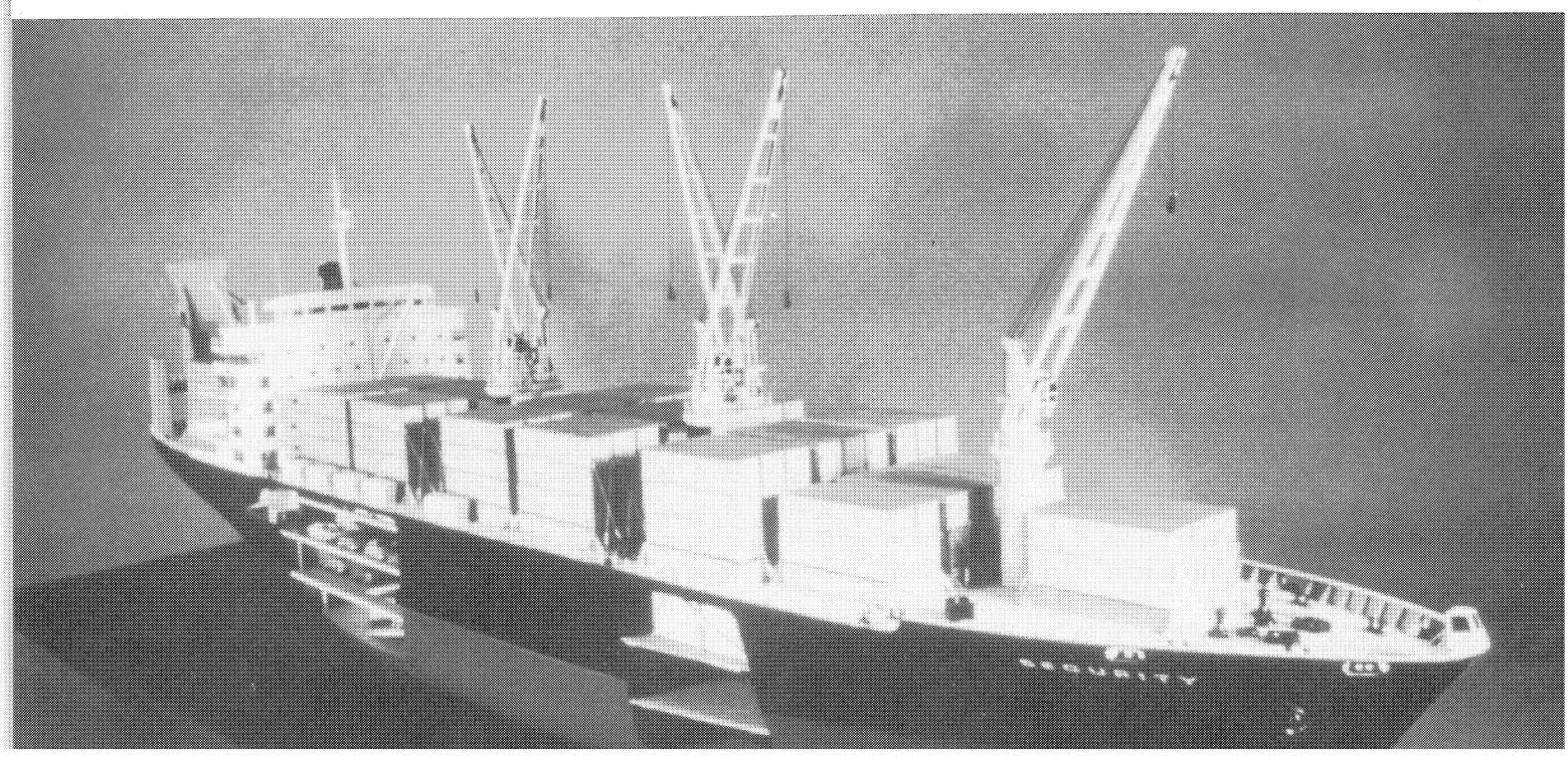
Alaska Terminal, recently dedicated by Port of Tacoma (Wash.) for use by Totem Ocean Trailer Express, Inc., covers 25 acres; includes 920 trailer parking stalls.

First permanent shoreside crane in Port Everglades, financed by Sea-Land Industries, was placed in operation in fall of 1979; expedites container handling at South Florida facility.









Chapter 6

Research and Development

The Maritime Administration conducts an active research program which is aimed at lowering the costs of operating U.S.-flag ships and building ships in American yards. In close cooperation with the marine industry, MarAd undertakes numerous research contracts each year. During fiscal year 1979 the Agency committed $19.2 million to the contracts that are listed in Appendix III. An additional $6.7 million was committed to these contracts by industry.

One of the keys to a competitive merchant marine is the steady improvement in productivity through the application of technology. The maritime research program covers a wide range of technology, from advanced satellite communication techniques to better ways to pick up a container. Each project has as its goal a more productive, efficient merchant marine and the success of each is measured by the implementation of results rather than the mere issuing of reports.

Assisting the Washington headquarters in these efforts is the National Maritime Research Center at Kings Point, N.Y. Many technical seminars are held in New York and elsewhere around the country in an effort to disseminate the latest research findings to U.S. industry as quickly as possible.

Montage of pictures of "Security" ship model illustrates versatility and self-sustained cargo-handling flexibility built into MarAd's Multi-Purpose Mobilization Ship design. Project moved from preliminary design to contract design phase in FY 1979 (see Chapter 1).

Ship's Machinery

The skyrocketing costs of energy have made fuel costs dominant in the economics of shipping. MarAd's Ship's Machinery Program addresses that problem directly. Its aim is to develop safe, reliable and, most importantly, fuel-efficient machinery.

Most of the U.S. oceangoing merchant fleet is powered by steam turbines. Steam propulsion is a familiar and well tested way of moving ships but it has lagged behind other systems in fuel efficiency. Work continued in FY 1979 to improve that situation. Burner tests were conducted to improve the combustion process. Fuel oil is sprayed into the furnace of a marine boiler in a seemingly simple process of turning water into steam, but the way that fuel atomizes, combines with the oxygen in the surrounding air, and burns is of crucial importance to the efficiency of the process.

The tests were conducted on various burners to measure their effectiveness. Because small droplets burn more completely than large ones, their minute dimensions were measured by lasers in order to gauge the effectiveness of the different burner configurations.

Today, burners also have to be adaptable to the poorer quality fuels that are appearing in marine bunkers, and ways are being sought to burn these inferior fuels as efficiently as possible.

The safety and reliability of ship's equipment is being considered in two other projects begun in this reporting period.

One seeks to develop better automatic throttle controls. With the advent of increased control of engine speed directly from the bridge (rather than orders being relayed to the engine room) there have been instances of the throttle control mechanisms malfunctioning, with disastrous results.

The other safety project is investigating the influence of uptake configurations and the exact source of inerting gasses taken from the uptakes. These gasses are pumped into empty cargo tanks, where they inhibit explosions. If they are taken from the wrong place it is possible that gasses may have too high an oxygen content to have a completely inerting influence.

National Steel and Shipbuilding Co. in San Diego demonstrates advanced technology ship's framebender. Automated machine, designed to reduce time and cost of forming ships' hulls, was developed under U.S. Navy contract. MarAd helped fund preliminary work in this project.

Shipbuilding

Most of the major shipyards in this country are actively involved in MarAd's shipbuilding research program. They share the costs, the workload, and the results of an effort that has covered nearly 150 projects since 1971. Some of the areas covered are welding, automation, production management, facility planning, and industrial engineering.

A large portion of the research in FY 1979 went into continuing and consolidating projects begun in previous years.

Work was continued on the development of standards and industrial engineering methods for shipyards, for example. Standardized parts will simplify the design and construction of vessels while they are on the shipways, and it will simplify their maintenance and repair while they are in service. Standardized methods, introduced through a comprehensive industrial engineering project, will also simplify shipbuilding by introducing manufacturing techniques to a traditionally craft-oriented process.

A semiautomated pipe fabrication facility which was begun in FY 1978 is proceeding on schedule. When completed, it will be one of the most productive facilities of its type in the world. Piping for ships is a very expensive item, and in FY 1979 work was begun on a system for computer-aided graphics for pipe detailing so that the design and installation of piping can be carried out in the most efficient manner.

Also started in FY 1979 was a major technology-transfer project which is being carried out in cooperation with two shipyards, one American and the other Japanese. The Japanese yard had considerable experience in building the type of bulk ships that the U.S. yard was undertaking, so an agreement was reached to transfer production techniques and experience from one country to the other. The benefits derived from this transfer are being put into detailed reports and distributed to all U.S. shipyards. This work has already precipitated a drive to refine preoutfitting and module-building methods among U.S. builders.

Advanced Ship Systems

During FY 1979 work was completed on a next-generation cargo liner concept. The effort was cost-shared by MarAd and seven U.S.-flag liner operators. The study found that: (a) it is technically and economically feasible to develop a standard cargo liner design that can meet the requirements of a large segment of the marine industry; (b) the standard design could then be series-produced at lower cost; (c) the resulting ships would be easier to maintain because of the ready availability of common parts; and (d) there would be a resulting pool of vessels well suited for national defense.

Work is also underway to standardize U.S.-flag dry-bulk carriers. The first phase of the project was completed in FY 1979. It brought together four contractors and 34 dry-bulk shipping companies seeking to devise standardized vessels that would best serve these trades. Market factors also were addressed. Dry-bulk markets (both import and export) were projected through the end of the century, with the study indicating that the total volume of U.S. dry-bulk trade would increase from the 256

million tons shipped in 1975 to 464 million tons in the year 2000, up 81 percent. Three vessels, covering a range of sizes, have emerged as the most appropriate designs to meet this growing demand with U.S.-flag ships.

Another important research project in advanced ship systems involves the proposed ocean shipment of coal in slurry form. Very large coal deposits are lying dormant in several Western states. Plans are being developed to move that coal to the West Coast in slurry pipelines, pump it aboard U.S.-flag slurry-carrying ships, and export it to the Far East. Preliminary studies show that such coal could be delivered to electric power plants in Japan and Korea at competitive prices. Such an energy transportation system would reduce the worldwide demand for petroleum fuels and improve the U.S. balance of payments.

Another energy-related project which was completed during the year was a study of marine transportation alternatives for the oil and gas resources located in the National Petroleum Reserve in Alaska. This study found that a fleet of 250,000-dwt. icebreaking tankers could be used to transport the fuels from Alaska's North Slope to the U.S. East Coast via the Northwest Passage. Such a system was found to be technically feasible and economically attractive when compared to transcontinental pipeline alternatives.

Industrial Plant Vessels

For thousands of years the sea has provided both food and a highway for international commerce. It can also be used as a large source of energy and minerals. Such use will require the development of a variety of marine systems and platforms. Anticipating such commercial activities, MarAd has established a research program for the development of industrial plant vessels. This program will look for ways to produce energy, manufacture products and recycle wastes at sea, and, in the process, provide a new market for American shipyards.

Several studies have already been completed. In cooperation with the Department of Energy, MarAd has investigated the feasibility of ocean thermal energy conversion (OTEC) techniques and has contributed to an OTEC test system. Ocean thermal conversion produces energy by utilizing the temperature differences between surface water and deep subsurface water that is found in various parts of the ocean. By vaporizing a fluid, such as ammonia, with the warm surface water and condensing it with cool subsurface water, a substantial amount of energy can be produced to drive turbines and do useful work. Other studies have been completed on the use of offshore plants for the incineration of toxic liquid chemicals and the recycling of trash. New projects were begun in FY 1979 on an open-cycle OTEC system for fresh-water production and energy generation and a platform for sludge processing.

Still another project is looking into the use of marginal offshore gas wells to power floating industrial facilities. Many gas wells are found and then capped because they produce insufficient fuel to justify piping it ashore. But small production plants, designed for the purpose and floated to the well sites, would find the amount of natural gas ample for their purposes. Even in the absence of fossil fuels, floating platforms may be used to convert marine kelp and sea weed into alcohol, which could then be used as a fuel.

Marine Science

The Maritime Administration's Marine Science Program is concerned with the structural make-up of the ship and its hydrodynamic characteristics as it moves through the water. In FY 1979 a number of projects were completed or underway in these areas.

Extending the season for Great Lakes shipping and making vessels on the lakes safer have been among the joint objectives of MarAd and other government agencies for a number of years. During this reporting period a technical and economic study of various levels of ship compartmentation was completed. (By definition, in a one-compartment ship any one of a ship's several compartments can be flooded without the ship sinking; in a two-compartment ship, any two can be flooded, and so on.) There are substantial costs involved in increasing the compartmentation of a ship and this project studies the increases in cost versus the increases in safety.

Also completed was a two-phase study regarding "blackwater" and "greywater" vessel waste facilities on the Great Lakes. The project provided an up-to-date inventory of shoreside and shipboard disposal facilities and addressed current legislation. It was funded by the U.S. Army Corps of Engineers and administered by MarAd under the auspices of the Winter Navigation Board's Season Extension Demonstration Program.

Development of a hull-stress monitoring and guidance system for Great Lakes bulk carriers also was completed this year and a cost-shared, follow-up program was initiated to install a prototype of the system on board a 1000-foot Bethlehem Steel Corp. self-unloading bulk carrier under construction at Bay Shipbuilding in Sturgeon Bay, Wis. The objective of this system is to monitor, record, and visually display critical vessel stress and motions. The data will provide guidance to the ship's captain and deck officers, allowing them to avoid improper loading or ballasting while underway.

The phenomenon of springing of Great Lakes vessels was also studied in FY 1979. Ships spring, or flex, up and down in the middle in reaction to waves. The stresses that are built

up because of this are important considerations in the design process. Related to this research is the work on the hull-stress monitoring system described above.

Another research project to improve the safety of ships in all waters involves maneuvering studies. This MarAd-sponsored research seeks to determine how to control large ships in crowded traffic conditions or restricted channels. One study is developing a method for assessing collision risks in maneuvering. Others are looking at new ship rudders and other steering concepts.

University Research

In FY 1979 MarAd inaugurated a University Research Program committed to innovative fundamental research. Although initially administered within the Marine Science Program, this effort seeks proposals in all areas of maritime endeavor. Each year a solicitation will go out to the academic community for research that will seek to stimulate technological exploration rather than directly develop technology. The objective is to develop a core of basic knowledge which can be assimilated into MarAd's other programs. During FY 1979, 10 universities were engaged in 12 separate studies.

Ship Performance and Safety

Research was continued in FY 1979 on a broad range of other projects intended to make shipping more efficient and safer.

These included the investigation of hull-performance standards for their effects on ships' speed-to-fuel ratio, and also ways to optimize ships' routing over their trade routes for further fuel saving.

Phase I of a study to use the damping characteristics of liquefied natural gas (LNG) tanks in order to detect hairline cracks was completed during the year.

The safe docking of Great Lakes ships was the subject of another project. This research demonstrated the use of existing radar displays as part of an integrated system for precise ranging of distances as the large vessels maneuver alongside cargo piers.

Crew safety rather than ship safety was considered in two separate works. One sought to determine the amount of airborne asbestos fiber released to the air during specific maintenance actions, and the other to assess crew illness and injuries aboard U.S. merchant ships and analyze these data to determine frequencies, causes, and trends.

Fleet Management Technology

A Fleet Management Technology Program was established during FY 1979. The program is designed to enhance productivity and profitability in ship operations through its work in four areas—corporate planning, cargo services, marine operations, and performance evaluation.

Initial emphasis was on performance evaluation. Four projects were begun and substantially completed. One analyzed the productivity of the U.S.-flag fleet; another conducted a competitive assessment of American ships; a third looked at the industry's financial performance; and the fourth studied the cost impacts of Government regulations.

To control the costs of barge operations, work was begun on a tank barge information system. A feasibility study will look into the uses and costs of a real-time barge and cargo locator system.

Another project will investigate all of the administrative functions that are now performed aboard ships and find ways to streamline these functions through the use of computers.

Additionally, a new and more flexible arrangement for involving ship operators in this program was started. Proposals were solicited from the U. S. maritime industry and seven companies replied.

Navigation/Communications

In the field of advanced navigation during FY 1979 MarAd worked with other agencies on the formulation of a Federal Radionavigation Plan. The plan, which has been approved by the President, includes the scheduled phase-in of the new NAVSTAR Global Positioning System and the phase-out of certain obsolescent systems. NAVSTAR is a military satellite navigation system that will be made available to commercial users. It has a coverage, reliability, and precision that exceeds anything now available.

The MARISAT system, a commercial communications satiellite system, gained increasing use among U.S.-flag carriers in this reporting period. MarAd tested an Emergency Position Indicating Radio Beacon using the MARISAT channels. This beacon can transmit a distress signal which would give a troubled ship's location and identity to rescuers around the world. In its regular communications mode, MARISAT offers

high quality voice and data links, and will continue to do so for some time. However, MarAd and representatives of other countries are already looking ahead to the next generation of marine communications. INMARSAT, an international system, is expected to become the primary global marine communications system by the end of the century.

In terrestrial communications, the Inland Waterways Communications system received favorable consideration from the Federal Communications Commission. This removed a 4-year impediment to the system which will provide very high frequency radio service to vessels on Western U.S. rivers.

Other nonsatellite research projects investigated the use of spread spectrum techniques. These use a broad range of frequencies at very low amplitudes and do not interfere with other communications in the same frequency range. International discussions also were initiated to standardize a worldwide digital SELCALL (select-call) system which will allow a caller to reach one specific ship in much the same way that a shoreside caller can reach one specific telephone.

Cargo Handling

Cargo handling is one of the more expensive aspects of the transportation process. To lower this expense, U.S.-flag liner carriers and MarAd have formed the Maritime Applied Research in Cargo Handling (MARCH) group. The MARCH group jointly funds projects to improve cargo handling technology, and monitors the work of the Agency's cargo-handling program. That work continued during the year with projects on terminal layout design, remote monitoring of refrigerated cargo, the control of moisture caused by condensation in containers, and the development of a container stowage manual that can be used by shippers to raise container utilization and lower cargo damage.

Work also continued on a project to provide military sealift capability on containerships. Because military cargo is often too large for conventional containers, and because containerships now constitute such a large percentage of the U.S.-flag fleet, ways are being pursued to meet emergency transportation requirements. The engineering design for 'tween deck modules, which could be fitted into container cell guides and accommodate such cargo, is nearing completion. The result will be a system that allows containerships to ply their normal trades, yet be quickly convertable to military transports should the need arise. Also in support of national defense, a joint feasibility study was conducted by MarAd and the U.S. Navy for a modular stern hose reel which would allow merchant ships in convoy to refuel naval escort vessels.

In the area of bulk cargo handling, an interagency study was begun to examine the causes of breakage during the handling of such commodities as rice, soybeans, and corn. Conducted with Department of Agriculture assistance, this effort will recommend ways to avoid grain breakage.

CAORF

MarAd's Computer Aided Operations Research Facility (CAORF) at Kings Point, N.Y., completing its third year of operations in FY 1979, tested human responses in a variety of controlled situations and environments. CAORF is a very advanced research tool which uses visual and electronic imagery to simulate what happens on a ship's bridge during various operations and conditions. These can include harbor scenes, vessel traffic, nightfall, fog—almost anything encountered by an actual ship.

Among questions the MarAd research facility seeks to answer are:

What is the contribution of the human factor in ship operations?

How do the strengths and weaknesses of the shiphandler interact with bridge instrumentation?

What are the best ways to handle different emergency situations?

CAORF has been compiling a solid data base of information that can be used to design ships, or harbors, or new rules of the road.

During the year CAORF worked in the following areas:

- Ship control and maneuverability: Experiments tested piloting performance as a function of ship design, aids to navigation, environmental conditions, and ship strategies.
- Grounding and collision avoidance: Experiments tested collision-avoidance procedures in open waters and navigation in coastal waters.
- Harbors and waterways analysis: Piloting operations were tested in specific harbors and waterways.
- Bridge system design: Experiments were designed to address man/machine concepts and operating procedures on the bridge.
- Certification and training research: Training methods for all potential watchstanders were studied.

Two methods of ship operations research are used at CAORF, on-line (using visual simulation) and off-line (using computers only). Using one or both methods, the facility in FY 1979 conducted projects for the Coast Guard, several ship operators and ports, and for MarAd's own account on a core research program. The results have been widely distributed and several symposiums have been held to acquaint the marine industry with important findings.

Chapter 7

The Marine Environment and Energy Conservation

The Maritime Administration conducts programs and participates in national and international efforts to preserve and improve the marine environment and encourage the more efficient use of energy.

Environmental Protection

The Agency's environmental activities in FY 1979 included the following:

- Assisted in the Federal Government's program to eliminate the ocean dumping of hazardous waste materials by supporting an incineration-at-sea economic and environmental viability study leading to the possible construction of an incinerator ship.
- Continued efforts to assure compliance with MarAd standards for pollution abatement by subsidized tankers.
- Participated in a number of international conferences and technical meetings on marine pollution control and abatement (see Chapter 10).

Semisubmersible drilling rig OCEAN VICTORY maneuvers under own power toward TEXACO, Inc., drilling site in Baltimore Canyon off Atlantic City, N. J. Rig, owned by Ocean Drilling and Exploration Co., stands nearly 30 stories high.

- Initiated a project to develop a comprehensive environmental assessment of the Agency's Asbestos Hazard Control Program as it relates to MarAd activities, MarAd personnel, and personnel under MarAd administrative control.
- Began a survey of U.S.-flag tank vessel owners to update information on the retrofit options selected by tanker operators to satisfy the Port and Tanker Safety Act of 1978 (P.L. 95-474). (The survey will assist MarAd in determining U.S. shipyard retrofit capability, equipment availability, scrapping, and new construction plans.)
- Continued experiments on the Computer-Aided Operations Research Facility (CAORF) ship-maneuvering simulator to investigate methods of reducing the risk of ship-to-ship collisions (see Chapter 6 and Appendix III).
- Took part 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.
- Participated in the work of the Environmental Evaluation Work Group of the Great Lakes–St. Lawrence River Winter Navigation Demonstration Program.
- Initiated development of the Presidential Oil Pollution Insurance Study to determine whether adequate private oil-pollution liability insurance is available to owners and operators of vessels and onshore and offshore facilities.
- Completed the first phase of a comprehensive research effort to determine the extent of exposure to asbestos fibers encountered by U.S.-flag ship seafarers, both under ambient conditions and during maintenance and repair activities.
- Supported a study of the technical concepts and the economics of trash recycling on waterborne vessels.
- Completed a final environmental-impact statement on Title XI tank vessels engaged in domestic trade.
- Supported a study of the disposal of blackwater (sewage) and graywater (bath and dishwater) wastes generated by commercial vessels on the Great Lakes.
- Supported a study of the applicability of shoreside air quality emission laws to merchant vessels in port.
- Continued in-depth environmental and economic analyses of various tanker-design alternatives for evaluating the post-1978 Tanker Safety and Pollution Prevention Conference's requirements for the protective location of segregated ballast.
- Supported a study of port planning strategies and policy alternatives governing waste-reception facilities for chemical tankers.
- Continued the Agency's Bulk Carrier Operations Safety Enhancement Project, which covers tank washing, tank atmosphere control, and tank electrostatics for tank vessel petroleum cargo tanks.

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 design, construction, equipment, and operational standards. Pollution-control

NORRIS TIDE, 180-foot offshore tug/supply boat built by Halter Marine, Inc., New Orleans, La.

measures are employed within a broad Agency action plan in the design, construction, and operation of merchant ships to protect the marine environment from the discharge and/or dumping of pollutants, such as oil, hazardous substances, sewage, and garbage. Also of concern are vessel stack and volatile vapor emissions into the atmosphere.

The MarAd-supported study of the economics and environmental viability of a U.S. incinerator ship for disposing of hazardous wastes was completed in December 1978. This study concluded that a U.S.-flag incinerator ship was both economically and environmentally feasible. On February 22, 1979, the Maritime Subsidy Board issued a final opinion and order in the matter of the environmental review of the Maritime Administration Chemical Waste Incinerator Ship Project, including review of the Final Environmental Impact Statement issued on July 2, 1976, under the National Environmental Policy Act of 1969. MarAd support for this project could include the sale of a surplus vessel from the National Defense Reserve Fleet, the granting of Title XI mortgage loan guarantees, and research and development support for an incinerator ship system safety analysis.

Research efforts under MarAd's continuing Bulk Carrier Operations Safety Enhancement Project are directed at investigating the effectiveness of inerting, ventilating, and freeing gas in the cargo oil tanks of tank vessels. A Phase II report published in October 1978 presents electrostatic results from laboratory scale-model tests of ship tank washing and liquid sloshing using fresh water, seawater, and crude oil liquids. During Phase III, full-scale tests will be conducted aboard a very large crude carrier. The results of this third phase will be used to verify the validity of utilizing modeling techniques for predicting full-scale effectiveness.

Environmental-Impact Statements

In FY 1979 MarAd made public and simultaneously submitted to the Environmental Protection Agency (EPA) a final environmental-impact statement on tank vessels engaged in domestic trade and financed under the Title XI program. Subsequently, the EPA approved the document as satisfying its criteria.

During this reporting period, MarAd also reviewed and commented on draft environmental impact statements from other Agencies on outer continental shelf resources development, vessel traffic services, incineration of wastes at sea, regulations to implement the results of the 1978 International Conference on Tanker Safety and Pollution Prevention, management of hazardous wastes, crude oil transportation, and disposal of radioactive waste.

Thirty-six-foot oil spill skimmer, built for U.S. Navy by Marine Construction and Design Co., Seattle, Wash., demonstrates oil recovery capability. Vessels were among those used in 1979 oil cleanup operations in Gulf of Mexico.

Construction and Operational Standards

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 of the Agency's Standard Specification for Merchant Ship Construction.

The International Conference on Tanker Safety and Pollution Prevention (TSPP) was held under the auspices of the Intergovernmental Maritime Consultative Organization in February 1978. The Conference produced amendments to the 1974 Safety of Life at Sea Convention and to the 1973 Marine Pollution Convention.

MarAd continued its investigation of the design, cost, and pollution-abatement effects of the protective location of segregated ballast tanks (PL/SBT) as formulated by the 1978 TSPP Conference. The TSPP formulation has been related to the U.S. Coast Guard PL/SBT formulation of January 8, 1976, and the basic draft, trim, and tank size requirements of the 1973 Marine Pollution Convention. This study has been coordinated with the Coast Guard and the American Bureau of Shipping.

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

During the year MarAd worked closely with the Coast Guard in its efforts to implement the Port and Tanker Safety Act of 1978. This act sets up stringent requirements to prevent marine pollution, including vessel-operating, waterfront safety, and pilotage requirements; conditions for port entry; vessel design standards; personnel and manning standards; and a marine safety information system. The vessel design standards, for the most part, reflect the results of the 1978 TSPP Conference.

Energy Conservation

In the U.S. maritime industry, as in its own operations, MarAd acted to conserve fuel and promote the efficient and environmentally sound use of energy.

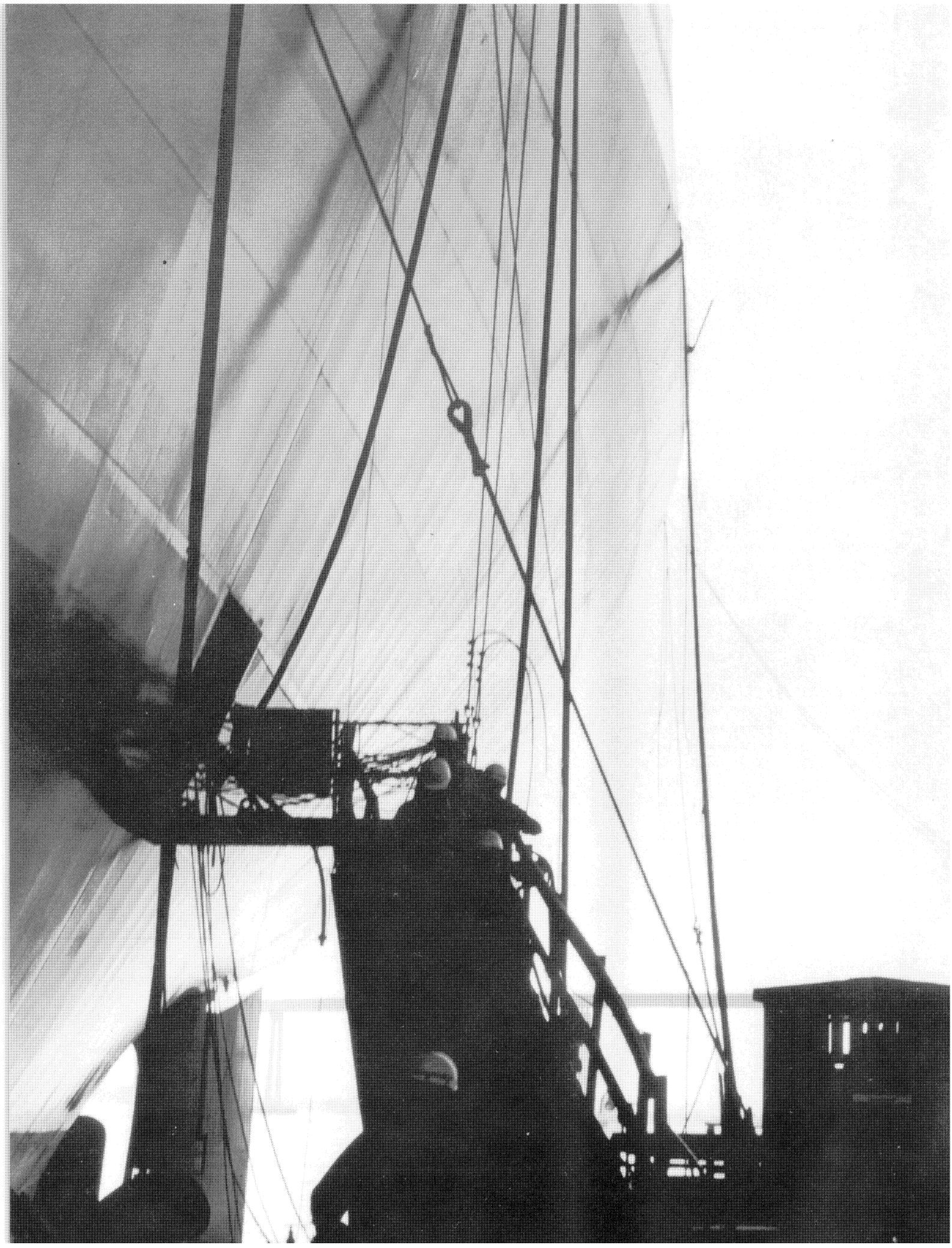
For the sixth year in a row—since the Agency began monitoring the consumption of fuel oil and electricity in the operation of the National Defense Reserve Fleet—the amounts used were reduced, compared to the base year, FY 1973. Electrical consumption at the various Reserve Fleet sites in FY 1979 was reduced by more than 2 million kilowatt hours, or 36 percent, while diesel fuel used in all fleet operations amounted to some 2,800 fewer gallons, or 1.4 percent less, in this reporting period.

At the U.S. Merchant Marine Academy in Kings Point, N.Y., old, energy-inefficient, single-pane windows in Fulton Hall were replaced with thermopane windows, completing a $300,000 project in compliance with the President's energy conservation program.

The Academy also began a diesel engineering course for licensed marine engineers, fulfilling a training requirement stemming from the current trend toward greater use of energy-efficient, diesel propulsion systems in the U.S.-flag oceangoing merchant fleet.

Also at Kings Point, plans were announced for a new Public Works Building which will utilize solar power.

In its research and development program, MarAd gave further impetus to ocean thermal energy conversion (OTEC) and other experimental systems which utilize the energy forces and resources of the sea.



Chapter 8

Maritime Labor and Training

The Maritime Administration's maritime labor and training programs help provide well-trained personnel for the American merchant marine; help coordinate maritime labor policies with national and international organizations; provide "hands-on" training to qualified seafarers; aid in the conduct of peaceful labor relations; and set manning levels for subsidized vessels.

U.S. Merchant Marine Academy

The U.S. Merchant Marine Academy in Kings Point, N.Y., trains young men and women to become officers in the American merchant marine. In addition to their classroom training, midshipmen spend a year at sea on American-flag vessels.

All graduates receive U.S. Coast Guard licenses as deck or engineering officers or both—and Bachelor of Science degrees. Most graduates are also offered Ensigns' commissions in the U.S. Naval Reserve.

The Class of 1979 included 114 third mates, 120 third assistant engineers, and 19 graduates who completed the dual deck/engine program. Among the graduates were 15 women.

Some 95 percent of the 253 graduates found employment on commercial vessels or were assigned to active duty in the Navy or Coast Guard. This reflects an upward trend in shipboard employment for Kings Point graduates which began in the late 1970s, largely due to increased retirements from the active seagoing workforce.

Average enrollment at the Academy during the year was 1,109.

At the beginning of the 1979-80 school year the Regiment of Midshipmen included 78 women—15 of whom are scheduled for graduation in June 1980.

Members of Congress nominated 2,596 constituents for the Class of 1983. From this group 355 appointments were made this fiscal year.

Also during this reporting period, for the first time, a special Great Lakes course was established at the U.S. Merchant Marine Academy. The 10-week, 30-hour course will be offered as an elective subject for deck midshipmen, beginning in January 1980.

State Maritime Academies

The Maritime Administration provides financial assistance 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.

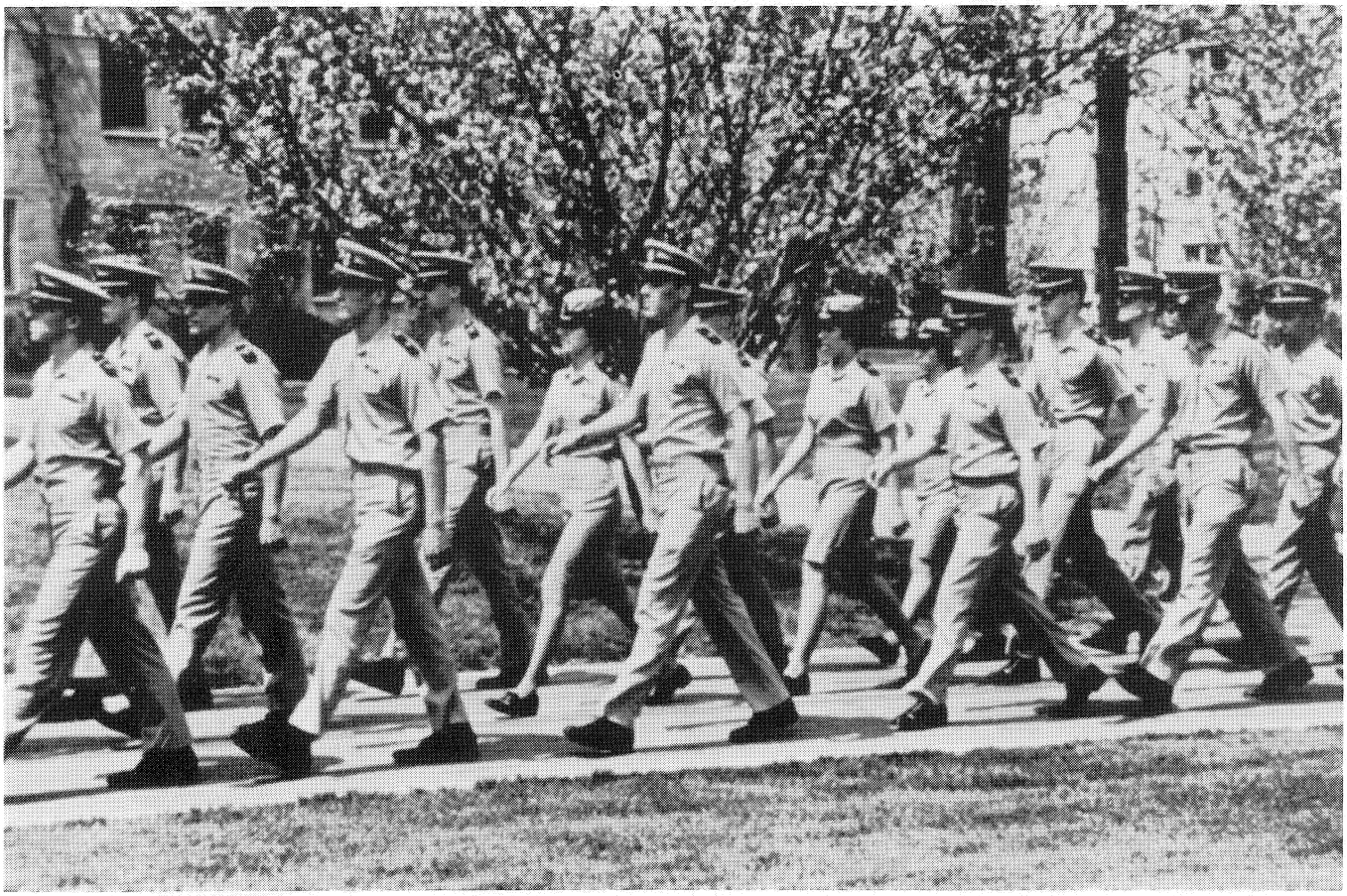
These academies are located at Vallejo, Calif.; Castine, Maine; Buzzards Bay, Mass.; Traverse City, Mich.; Fort Schuyler, N.Y.; and Galveston, Tex. Five hundred ninety-seven midshipmen graduated from the six academies in June 1979. In addition to U.S. Coast Guard licenses, graduates of five academies receive Bachelor of Science degrees (Associate degrees are awarded at the Michigan Academy) and, if qualified, are commissioned as Ensigns in the U.S. Naval Reserve. After graduation, 86.5 percent of the graduates found employment afloat or were serving on active duty in the Navy or Coast Guard.

The Administration's budget request for FY 1980 included $3.5 million for activation of a suitable trai ing vessel to replace the TS BAY STATE, a 36-year-old ship which MarAd previously had provided to the Massachusetts Maritime Academy.

Maritime Training

MarAd operates Radar Training Centers in New Orleans, New York, San Francisco, Seattle, and Toledo for the instruction of qualified merchant mariners, operators of inland waterway and 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.

Workers enter hull of tanker ARCO ALASKA under construction at National Steel and Shipbuilding, San Diego.



Midshipmen on the march at U.S. Merchant Marine Academy, Kings Point, N.Y.

In fiscal year 1979, 2,650 students received training in collision-avoidance radar navigation, gyrocompass, and LORAN at these centers. To improve MarAd's radar training capability, contracts were awarded to install several new student radar display learning stations and replace old electronic radar training simulation equipment at the San Francisco and Toledo sites. A contract also was awarded to modernize classroom spaces for San Francisco, and work was begun to upgrade the center's training proficiency in collision-avoidance radar and other electronic navigation aids.

During this reporting period MarAd continued its participation in activities of the industry-organized Maritime Training Advisory Board's (MTAB Subcommittees for the Development of Effective Firefighting Training and for Educational Coordination.) The firefighting training film, "What We Owe Each Other," which was produced largely through the efforts of the Subcommittee for the Development of Effective Firefighting Training, received the Golden Eagle Award of the Council on International Nontheatrical Events (CINE). This is the introductory film of a film series on firefighting which MarAd plans to produce.

Firefighting and damage control courses for merchant seafarers were conducted during this reporting period by MarAd at Earle, N.J., and Treasure Island (San Francisco) in cooperation with the U.S. Navy's Military Sealift Command and the U.S. Coast Guard. A total of 3,511 seafarers received training at those schools during FY 1979.

MarAd's Western Region entered into an agreement with the Naval Support Activity at Treasure Island for expanded use of those facilities, doubling the maritime firefighting training capacity on the Pacific Coast.

In anticiptaion of new U.S. Coast Guard firefighting training requirements for American merchant seafarers, MarAd planned further expansion at the New Jersey facility and the establishment of standardized firefighting training facilities in Toledo and New Orleans.

During the fiscal year lease agreements were signed and preliminary action was taken to construct firefighting simulators at the Toledo and New Orleans sites. MarAd negotiated with the Toledo-Lucas County Port Authority to use a site adjacent to the Toledo Airport as a Great Lakes marine firefighting school, with training expected to begin in the next fiscal year.

Table 20: MARITIME WORKFORCE AVERAGE MONTHLY EMPLOYMENT

	Average Monthly Employment in Fiscal Year:	
	1978	1979
Seafaring Shipboard Jobs:	**26,622**	**26,979**
Shipyard: [1]	**123,759**	**115,174**
Production Workers	97,983	95,767
Management and Clerical	25,776	19,407
Longshoremen:	**52,100**	**49,103**

[1] In commercial yards able to construct ships 475 by 68 feet.

In still another maritime training area—diesel engineering—89 students completed a new 6-week course which was established at the U.S. Merchant Marine Academy in FY 1978 for licensed merchant marine engineering officers. The course is approved by the U.S. Coast Guard as equivalent to the 6 weeks of sea experience required on diesel vessels needed to become eligible to take diesel upgrading examinations.

Additionally, to improve the training program, a contract was awarded at the close of this fiscal year to provide a Medium Speed Diesel Engine Automation System Trainer at Kings Point.

Labor Relations

Fiscal year 1979 was a highly productive period for U.S. maritime labor-relations. Only two major job actions occurred.

The International Longshoremen's Association's United Marine Division, Local 333 initiated a strike of the Port of New York on April 2, 1979. Approximately 2,800 tug, barge, and tanker crewmen were involved, with substantial cargo delays and diversions resulting. Normal operations were restored with the ratification of a new contract on June 28.

In the spring of 1979, the International Brotherhood of Teamsters went on an 18-day strike which affected truck movements nationally. Most major ports reported reduced levels of cargo and sailing delays, especially in containerized freight.

Labor Data

Average monthly U.S. seafaring employment in all sectors (private, Government contract, and Great Lakes) increased slightly to 26,979 jobs in FY 1979, from 26,622 in FY 1978 (see Table 20). However, this increase was partially due to a longshoremen's strike the previous year.

The total workforce in selected U.S. commercial shipyards decreased 6.9 percent, from 123,759 in fiscal year 1978 to 115,174 in fiscal 1979 while average longshore employment declined from 52,100 to 49,103.

Several studies of the maritime workforce were undertaken during this reporting period.

The first was an examination of the U.S. offshore marine oil and gas drilling industry. This study, entitled "Workforce Supply and Demand Study, 1979-1988, for the Offshore Oil and Gas Exploration Support Craft Industry," was prepared by MarAd with the cooperation of the industry. It identified critical current and future workforce shortages and problems within the industry, and discussed possible remedies to correct these unfavorable situations.

Welder at work on bottom plates of ship's hull in drydock at Todd Shipbuilding's Seattle (Wash.) Division.

Work on a second in-house report, entitled "Licensed Officer Supply and Demand, 1979-1988," was nearing completion at year's end. This study examines the current and future workforce supply and demand conditions for the deep sea, Great Lakes, peripheral and Civil Service marine sectors. It documents current existing labor shortages and forecasts that this situation will not improve in the near future. It also examines and recommends various alternatives to correct current and projected workforce problems.

The Agency, using its computer-based Seamen's Employment Analysis System, also completed an analysis of the active seafaring workforce. This system, which processes information gathered by the Coast Guard, describes the workforce in terms of age, skill level, and area of employment. The analysis indicated that the total number of merchant mariners finding full or part-time employment aboard U.S.-flag vessels during calendar year 1979 was 75,698. This figure does not include Civil Service personnel aboard vessels of the Navy's Military Sealift Command or persons working on inland waterways other than the Great Lakes.

MarAd also released a study of Great Lakes vessel crewing requirements. The study, "Deck and Engine Officers Supply and Demand 1978-1987," analyzed current and projected trends in fleet composition, new officer entrants, officer attrition rates, and paid vacation periods.

The study projected that the demand for both deck officers and engine officers would increase appreciably by 1987 if corrective action were not taken.

Predicated on this analysis, the Lake Carriers Association, Upper Great Lakes Regional Commission, and other maritime interests developed a recruitment program in cooperation with the Great Lakes Maritime Academy. This effort had resulted in a threefold increase in applications for employment on the Lakes by the fall of 1979. Inquiries about future career opportunities also increased from an average 200 to 2,000 per year. The number of officers graduating from the Academy is expected to triple by 1983.

MarAd will continue to monitor workforce conditions over the next several years with the Great Lakes Region maintaining close liaison with local industry and labor representatives.

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.

During this fiscal year the Merchant Marine Distinguished Service Medal was presented to Enas P. Kershaw, a licensed inland towing vessel operator, in recognition of his heroic actions of March 24, 1979. Kershaw was cited for re-seating the safety relief valves on board a barge carrying butane gas after the barge struck a bridge in Morgan City, La.

Merchant Marine Meritorious Service Medals were also presented to the Master and crew of the tug SKAGIT CHIEF for their heroic efforts during the rescue of 14 survivors from the fishing vessel GLACIER KING on August 13, 1978, in the Bering Sea.

The Meritorious Service Medal also was awarded to Chief Engineer Hilbert G. Desplas of the SS DELTA BRASIL. Desplas was recognized for his heroic action in attempting to rescue a fellow seaman who drowned while the ship was anchored in Belem, Brazil, on November 10, 1978.

Letters of Commendation were presented to Captain L. S. Jordan and the crew of the SS PRESIDENT ROOSEVELT for the rescue of 172 Indochinese refugees from a leaking boat in the South China Sea on October 22, 1978; Captain John Crichton and lifeboat crew members of the British passenger ship PACIFIC PRINCESS for their rescue of 14 survivors of the fishing vessel ITASCO near Sakie Bay, Alaska; Captain H. Darrel Davis and the crew of the tug STALWART for their rescue of four survivors of the crab boat OCEAN CAPE after the vessel sank in the Gulf of Alaska; Captain George B. Cardew of the SS MANULANI in recognition of his skillful execution of the rescue of a pilot, who was forced to ditch his aircraft near Honolulu; Captain J. Adams and the crew of the SS PONCE in rescuing three survivors of a shrimp boat off the Bahamas; Cleveland P. Mayer of the motor vessel TERRY for the rescue of three survivors of the M/V MISS KIM after it collided and sank in the Mississippi River; and Dorothy R. Regrut, waitress on board the SS PRESIDENT MCKINLEY for her alertness and expertise in saving the life of a passenger by the use of the Heimlich Maneuver, a first-aid technique.

Chapter 9

National Security

One of the Maritime Administration's primary concerns is the readiness of the American merchant marine to support any national defense effort. This part of the Agency's mission is firmly established in American history and tradition. Since the founding of this Nation the Federal Government has given guidance and assistance to the American merchant marine as the fourth arm of defense. The Federal role is to assure that the U.S. merchant fleet has the shipping capacity and private American shipyards the capability to build the vessels required for the logistical support of our armed forces and for the essential support of the civil economy in times of military conflict.

In pursuit of this mission, MarAd works closely with the U.S. Navy and other agencies on national security matters and maintains the National Defense Reserve Fleet (NDRF) as a ready source of vessels wherever they are required.

RO/RO ATLANTIC BEAR is moved into anchorage, dwarfing other vessels in layup at National Defense Reserve Fleet, James River, Va.— one of three NDRF locations.

Reserve Fleet

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

On September 30, 1979, the NDRF consisted of 317 ships. This figure excluded one ship undergoing preactivation as part of the Agency's Ready Reserve Fleet (RRF)—a special part of the NDRF—and one which had been sold but not delivered. Also excluded were the Pacific Far East Line, Inc., RO/RO vessel ATLANTIC BEAR, moored in the James River Reserve Fleet; the Wilmington Trust Co. RO/RO ILLINOIS; and five States Steamship Co. general cargo vessels —the COLORADO, MICHIGAN, IDAHO, WYOMING, and MONTANA. The latter six ships were moored at the Suisun Bay (Calif.) Reserve Fleet on behalf of the U.S. District Court, Northern District of California.

During the fiscal year 23 ships were added to the Reserve Fleet and 13 were withdrawn. The number of ships in MarAd's Fleet Preservation Program, which involves conventional preservation, dehumidification and cathodic protection, increased from 211 to 220 during the year.

The number of vessels in the NDRF at the end of FY 1945 through FY 1979 is shown in Table 22.

Ready Reserve Fleet

In June 1975 MarAd initiated a 5-year program to provide the U.S. Navy with sufficient shipping to accommodate a sealift capability of approximately 340,000 measurement tons to be available on 5 to 10 days' notice.

In November 1976 a Memorandum of Understanding between the Departments of Commerce and Navy provided for the establishment, maintenance, and control of the Ready Reserve Fleet as part of the NDRF. The memorandum sets forth the conditions under which the specified ships will be held in a ready reserve status until needed by the Department of Defense (DOD).

Under the current RRF program, MarAd will maintain approximately 30 ships in an advanced state of readiness. The selected ships will meet all of the requirements of the American Bureau of Shipping, and the U.S. Coast Guard requirements for Certificates of Inspection. Funding for upgrading ships for the program is provided by DOD.

Thirteen general cargo vessels have completed upgrading to RRF status. They include five C-3 class ships, three Seatrain-type vessels, four C-4 Mariners and one Victory ship. Five vessels joined the fleet in FY 1979.

To provide an assessment of the RRF program, one of the ships is activated without prior notice each year. This year the SS WASHINGTON, a Seatrain-type vessel berthed at the Beaumont Reserve Fleet, was selected by the Military Sealift Command for the "No Notice test." The activation of the SS WASHINGTON, including a 24-hour sea trial, was completed in less than 7 days. Upon completion of the activation test the vessel was kept in active status for 3 weeks as a backup ship for REFORGER 79, a U.S. military exercise.

REFORGER 79

REFORGER 79 is an acronym for "Return of Forces to Germany," a 4-month exercise designed to test the military strategic mobility system in FY 1979. The SS MAINE was designated by the Military Sealift Command as the primary RRF ship to be deployed. In November 1978 the SS MAINE was assigned to a general agent, crewed, stored and outfitted; proceeded to Port Arthur, Tex., and loaded over 11,000 measurement tons of military cargo for Europe. The SS MAINE delivered her REFORGER 79 cargo on schedule and was subsequently utilized in the redeployment phase of the exercise returning military equipment to the United States. The opportunity for the MAINE to operate with the Military Sealift Command and the Military Traffic Management Command, together with the no-notice activation of the WASHINGTON, provided a realistic test of the RRF concept and capabilities.

After discharge her final military cargo at Port Arthur on March 14, 1979, the MAINE was deactivated and returned to RRF active retention status at Beaumont.

SS JEREMIAH O'BRIEN

Late in FY 1979, volunteers from the maritime industry in the San Francisco Bay area prepared the Liberty Ship SS JEREMIAH O'BRIEN to sail from her Suisun Bay Reserve Fleet anchorage under her own power to San Francisco. The ship will be restored to her original World War II condition and berthed in the Golden Gate National Recreation Area at Fort Mason, Calif., as an exhibit reflecting the heritage of the American merchant marine.

The National Liberty Ship Memorial, Inc., a citizens group which is sponsoring this work, received a grant of $436,532 from the National Maritime Heritage Program—an amount to be matched by private donations.

N.S. SAVANNAH

At the request of the Military Sealift Command (MSC) the Maritime Administration has approved the removal of the main propulsion reduction gear from the experimental nuclear ship SAVANNAH for installation in the AMERICAN EXPLORER, a T-5 tanker presently operated under an MSC charter. The reduction gear aboard the AMERICAN EXPLORER was in an advanced state of disrepair and the SAVANNAH's was no longer required. The transfer represented a Federal saving of an estimated $1 million. SAVANNAH, developed and operationally demonstrated in the 1960s by MarAd as America's first—and only—nuclear-powered merchant ship, is in lay-up at Charleston, S.C.

Ship Sales

In FY 1979 MarAd temporarily ceased its offering of NDRF vessels for scrap or nontransportation use to take account of recent concerns involving asbestos. Consequently, no vessels were sold for those purposes during this reporting period. However, in December 1978 two AOG tankers located at Pearl Harbor were sold under Private Law 95-20 for conversion and operation in the fisheries of the United States for their appraised value of $112,960.

Between 1958 and 1979 the sale of 2,291 vessels for scrap or nontransportation use returned more than $197.2 million to the U.S. Treasury.

USMER Reports

U.S.-flag merchant vessels operating in the foreign commerce of the United States continued to report their positions through the U.S. Merchant Vessel Locator Filing System (USMER). USMER was developed jointly by MarAd and the U.S. Navy to enhance the emergency responsiveness of the U.S. merchant marine and keep agencies of the Federal Government informed concerning arrivals, departures, and at-sea locations of U.S.-flag merchant vessels throughout the world. MarAd operates and monitors the system. During 1979 more than 300 U.S.-flag merchant vessels reported into USMER and approximately 215 ships filed position reports each week.

Merchant Marine Reserve

A U.S. Naval Reserve program, the Merchant Marine Reserve, was reactivated in FY 1979. In cooperation with the Navy Department, MarAd's Western Region, on September 12, 1979, sponsored the first meeting in this program, which seeks to increase mutual support between the Navy and U.S. merchant marine officers, including those on ships and some employed ashore. The regional meeting was held to enlist the endorsement and support of the maritime industry. Merchant Marine Reserve units will be established at the MarAd headquarters in Washington, D.C., and by the Agency's regional offices in New York, New Orleans, and San Francisco.

War-Risk Insurance

The war-risk insurance program administered by the Maritime Administration insures operators and seamen against losses resulting from hostile actions under circumstances in which commercial insurance is not available. During FY 1979 MarAd continued to administer war-risk and certain marine and liability insurance programs authorized by Title XII of the Merchant Marine Act of 1936, as amended.

The Agency's program authority ended on September 30, 1979, with the expiration of Public Law 94-523. However, legislation to restore it was introduced and was pending in the Congress at the close of this fiscal year.

At that time there were 1,866 binders outstanding to cover U.S.-flag ship owners during the 30-day period after the termination of commercial war-risk insurance, including 661 for war-risk hull insurance, 657 for war-risk protection and indemnity insurance, and 548 for war-risk insurance on lives and personal effects of crew members.

From the start of the binder program in 1952 through June 30, 1979, binder fees totaled $1.3 million, while expenses totaled $1.4 million. Of the latter, $516,613 was paid as fees of the underwriting agent employed by MarAd under contract to process binders. (Although binder fees did not meet all of the expenses in providing this type of coverage over a 27-year period, as noted below net income from other war-risk insurance programs, including interest earned on these proceeds, had increased total assets of the war-risk insurance revolving fund to $8.1 million as of September 30, 1979.)

Another type of war-risk insurance, covering builders' risks in the pre-launching construction period, was written on 164 vessels from the inception of the program in 1953 through September 30, 1979, with a premium income of $3.5 million. Fifty-three binders were issued for war-risk builders' risk insurance for the *post*-launching period from October 1962 through FY 1979. One of the latter was outstanding at the end of the program.

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, 1979, 38 commercial underwriting agents were under standby contracts.

At the request of the U.S. Navy, war-risk insurance was provided without premium charge, but on a reimbursable basis for losses incurred, as authorized under Section 1205 of the 1936 act. As of September 30, 1979, second seamen's war-risk insurance was provided for the crews of four 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 premim savings to the Navy under these two programs from their inceptions in 1954 and 1964, respectively, are estimated at $1.6 million, after deducting claims payments of $110,740.

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 June 30, 1979, earned interest totaled $4.7 million. Assets of the war-risk insurance revolving fund on that date totaled $8.1 million.

Marine Insurance

MarAd continued to act as the insuring agent for Government-owned ships during the fiscal year. On September 30, 1979, 18 marine protection and indemnity claims were outstanding, five of which were in litigation. Total settlement value of all cases was estimated to be $2.5 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 $2,242,000 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 that Ready Reserve Fleet vessel was operated on a self-insured basis under General Agency Agreement.

Table 21: NATIONAL DEFENSE RESERVE FLEET—SEPTEMBER 30, 1979

Fleets	Retention[1]	Scrap Candidates	Special Programs	Total
James River, Va.	101	16	40	157
Beaumont, Tex.	40	2	7	49
Suisun Bay, Calif.	79	8	24	111
Total	**220**	**26**	**71**	**317**[2]

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

MarAd assures that contract requirements are met on all insurance placed in comercial 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 1979 are shown in Table 23.

Oil-Pollution Insurance

During this reporting period, MarAd's Office of Marine Insurance was assigned to conduct a study required by Section 305(d) of Title III, Outer Continental Shelf Act Amendments of 1978 (92 Stat. 678—43 U.S.C. 1815 (d)). This study relates to the availability of, and competition in the market for, adequate private insurance against oil pollution. An interim report to the Congress was made in June 1979 and the final report is due on April 15, 1980. A contract has been awarded to develop data from the private sector to supplement that available from the public records.

Emergency Readiness

The MarAd Basic War Plan, a plan for continuity of Government operations, and a plan for shipping support of military reinforcement operations were published at the end of the fiscal year. The three new plans, which replace existing MarAd emergency plans, emphasize reliance on shipping industry management expertise to the fullest extent compatible with essential Federal control of merchant shipping in wartime.

Procedures for withdrawing U.S. and European NATO merchant ships from trade on short notice for reinforcement operations were tested in several major exercises. Systems were developed and tested for entering ship location reports directly in MarAd computer files and for computing the availability of ships for loading military cargoes, based on the current positions of ships at sea. Arrangements were made for direct access, in emergencies, to computer files of several Government agencies which record merchant ship movement information.

A secure, fall-out-protected facility, in which national defense shipping support operations can be conducted efficiently in crisis and war, was completed and used in several national and NATO exercises. The facility provides working space with communications and computer support for around-the-clock operations of MarAd staff, military liaison officers, foreign government representatives, and representatives of the shipping industry.

A December 1977 study of national defense and national security requirements for an adequate and well-balanced U.S. merchant fleet was revised and republished in December 1978. The 1977 conclusions remain valid: additional Roll-On/Roll-Off capacity is desirable to provide greater flexibility, and additional dry-bulk and tanker shipping is needed to provide U.S.-flag capacity to carry minimum essential wartime bulk imports.

In this reporting period, MarAd continued to press for early promulgation of regulations on voluntary agreements as required by the revised Section 708, Defense Production Act of 1950, as amended. The Voluntary Plan for Contribution of Tanker Capacity, a standby volunteer agreement between MarAd and industry, requires recertification by the Attorney General in April 1980. Pending publication in the *Federal Register* of codified regulations by the Federal Emergency Management Agency, which had not been accomplished by the end of FY 1979, MarAd prepared a proposed revision of the standby agreement.

Neil Goldschmidt, then mayor of Portland, Ore.—now Secretary of Transportation, welcomes participants to Pacific Coast Sea Power Forum in March 1979. MarAd was among sponsors of meeting. Seated at left is John J. Nachtsheim, MarAd Assistant Administrator for Shipbuilding and Ship Operations; in center, Vice Admiral C. A. H. Trost, U.S. Navy, Deputy Commander-in-Chief, U.S. Pacific Fleet.

On May 9, 1979, the Chief of Naval Operations (CNO) issued a policy statement amplifying the Department of the Navy's September 19, 1978, policy statement on Navy/merchant ship communications. The CNO policy provides for continuation of a viable high-frequency (HF) capability in support of tactical command and control and thereby supports MarAd actions to modernize HF communications on merchant ships, in parallel with encouragement of the expansion of satellite communications capabilities for merchant ships.

Revised arrangements for Federal control of ports in time of war were developed during the year. The revised plans call for execution of service contracts with State and municipal port authorities in place of the appointment of individuals as Federal Port Controllers as previously planned. Service agreements and terminal operating contract formats were published in the *Federal Register* and negotiation of standby agreements and contracts was begun.

The Department of the Navy affirmed that, as National Salvage Agent under Public Law 513, it intends to provide salvage and rescue towing service for merchant ships in time of war. MarAd will coordinate with the Navy Supervisor of Salvage to develop ways to mobilize civil salvage capabilities. Concurrently, as a result of a MarAd initiative, NATO civil shipping authorities are planning for coordination of wartime salvage activities among the NATO member countries.

In March 1979 MarAd hosted a training session for the NATO civil wartime shipping agency. The training session produced a useful critique of revised NATO wartime shipping plans, which take account of technological and economic evolution of world shipping generally and NATO merchant fleets in particular.

Plans for shipping operations in crisis and war were tested in national and NATO civil/military exercises and in exercises in the Pacific during the year. In all the exercises emphasis was placed on realism and on the practicality of plans and procedures, particularly at the interface between U.S. and allied civil and military agencies.

Also during the year, several legislative proposals were introduced to improve the suitability of the merchant fleet for national defense service and to upgrade the National Defense Reserve Fleet.

Industrial Preparedness

In cooperation with DOD, MarAd continued to revitalize the Industrial Preparedness Planning (IPP) Program. IPP's primary objective is to ensure that the marine industrial production base will be capable of satisfying marine material and equipment requirements in the event of a national emergency. During the year, two mobilization design tankers were selected by MarAd for coverage by this program, and planning at the subcontractor and vendor levels was increased.

As of September 30, 1979, a total of 2,217 IPP agreements had been negotiated with approximately 380 marine-related firms.

MarAd continued to participate actively in interagency Industrial Evaluation Board (IEB) operations by developing IEB analysis summaries for certain critical marine components, utilizing IPP data. During FY 1979 summary analyses were developed for stud unit anchor chain, fixed-pitch propellers, and main steam propulsion sets. These summary analyses were presented for IEB approval.

Table 22: NATIONAL DEFENSE RESERVE FLEET 1945-1979

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
		1979	317

Table 23: MARINE AND WAR-RISK INSURANCE APPROVED IN FY 1979

		Percentage	
Kind of Insurance	Total Amount	American	Foreign
Marine Hull	$8,188,000,000	58	42
Marine Protection and Indemnity	[1]	—	—
War-Risk Hull	7,019,000,000	54	46
War-Risk Protection and Indemnity	7,019,000,000	54	46

[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.

Chapter 10

International Activities

MarAd activities of international significance during fiscal year 1979 included bilateral talks with the Soviet Union, the People's Republic of China, and Poland; participation in international maritime conferences and organizations; and the work of the Agency's Foreign Maritime Representatives.

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

The designated representatives of the Governments of the United States and the Soviet Union met twice in FY 1979 for consultations to ensure effective implementation of the 6-year U.S.-U.S.S.R. Maritime Agreement which went into effect January 1, 1976.

At meetings held in January 1979, a mutually acceptable rate for the carriage of petcoke cargoes to the Soviet Far East in 1979 was agreed upon. Preliminary accounting of the carriage of bilateral liner and bulk cargoes in the first half of 1978 also was reviewed.

In September 1979 Assistant Secretary for Maritime Affairs Samuel B. Nemirow led a U.S. delegation to Moscow for the negotiation of a freight rate for the carriage of grain to the Soviet Union in 1980 and to review the movements of bilateral cargo in 1978. The designated representatives agreed to utilize an index method to determine the charter rate to be paid to U.S.-flag vessels for the carriage of grain to the Soviet Union during calendar year 1980. The formula is designed to be responsive to changing market conditions and provides a new rate each month. The designated representatives also agreed upon a mutually acceptable rate for the carriage of petcoke cargoes to the Soviet Far East for voyages made in 1980.

At the September meeting, the carriage of bulk and liner cargoes for the 1978 accounting period was discussed and it was agreed accommodations would be made during 1979 to rectify imbalances at the end of 1978.

Consular and administrative problems arising under the terms of the agreement also were discussed at the meetings. Agreements reached during the negotiations were documented in memoranda signed October 1, 1979.

In April 1979 the Governments of the United States and the Soviet Union reached an agreement to provide U.S. underwriters with a substantial share of the marine cargo insurance resulting from the U.S.-U.S.S.R. bilateral trade. Previously, U.S. underwriters had been unable to obtain an appreciable share of the insurance, which had been underwritten almost exclusively by Ingosstrakh, the Soviet state insurance company. Marine cargo insurance talks began in 1976, following 4 years of U.S. attempts to initiate negotiations on the issue.

In a Memorandum of Understanding Regarding Marine Cargo Insurance signed April 5, both sides agreed to specific measures designed to assure U.S. underwriters the opportunity to participate in the insurance of U.S.-U.S.S.R. bilateral cargoes. They agreed to meet annually to review the placement of marine cargo insurance and to exchange data necessary to evaluate compliance with the agreement.

PRC Negotiations

In May 1979 Assistant Secretary Nemirow accompanied Secretary of Commerce Juanita M. Kreps to the People's Republic of China. Draft texts of a proposed U.S.-PRC maritime agreement were exchanged.

Efforts to arrive at an agreement were expected to continue during 1980.

Capt. Bei Hanting of the Chinese vessel LIU LIN HAI leads his officers down gangplank at Seattle in April 1979 as first merchant ship from People's Republic of China arrives in America. Restoration of diplomatic and trade relations with China mainland after 30-year lapse led to opening of exploratory discussion of bilateral maritime agreement. American representatives in talks with PRC were led by Samuel B. Nemirow, Assistant Secretary of Commerce for Maritime Affairs.

Talks with Polish Officials

U.S. and Polish maritime delegations met in Washington in October 1978 to continue discussions of maritime matters, including possible joint maritime projects. The Polish delegation also visited the United States Merchant Marine Academy, Kings Point, N.Y., and terminal facilities and a shipyard in the New York City area.

International Conferences

MarAd representatives participated in 51 regularly scheduled international conferences and attended numerous ad hoc discussions on various international shipping matters during FY 1979.

The Intergovernmental Maritime Consultative Organization (IMCO), the Organization for Economic Cooperation 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 important to the U.S. merchant fleet.

MarAd representatives attended IMCO conferences dealing with maritime safety, marine pollution, bulk chemicals, nuclear ships, standards of training and watchkeeping, incineration at sea, ship design and equipment, safety of navigation, fire protection, and subdivision, stability and load lines. A MarAd representative also attended a joint IMCO/International Atomic Energy Agency technical committee meeting on port entry requirements for nuclear ships.

Items discussed at the 23rd session of IMCO's subcommittee on subdivision, stability, and load lines included harmonization of subdivision and stability requirements; intact stability; subdivision and damage stability of dry cargo ships, including Roll-On/Roll-Off ships, nuclear ships, and the protective location of segregated ballast tanks in oil tankers.

MarAd was represented on the U.S. delegation to the tenth session of the IMCO Marine Environment Protection Committee (MEPC) held in London from December 4 to December 8, 1978. Of primary interest to this Agency were items concerning the provision of reception facilities, oily water separators and monitoring equipment, crude oil washing and clean ballast tank specifications, a comprehensive antipollution manual, and enforcement of pollution conventions. MarAd participated in and presented a progress report on the Feasibility Study on Reception Facilities for Selected Ports in the Mediterranean.

The eleventh session of the MEPC was held in London from June 11 to June 15, 1979. Agenda items for discussion and action were similar to those addressed at the tenth session.

MarAd was represented on the U.S. delegation at two sessions of the IMCO Maritime Safety Committee (MSC) in London—from September 25 to September 29, 1978, and from May 7 to May 11, 1979. Major topics for discussion and for action included the outcome of the International Conference on Training, Certification, and Watchkeeping for Seafarers, 1978; an analysis of casualty reports; safety of navigation; the handling of dangerous goods in port areas; the safe transport of bulk chemicals; subdivision, stability, and load lines; and ship design and equipment.

MarAd participated in an IMCO-sponsored meeting of the Ad Hoc Group on Incineration at Sea held in London from February 19 to February 22, 1979. This meeting dealt with the following major agenda items: technical guidelines on the control of incineration of wastes at sea, results of recent and current research on incineration wastes, and construction of incineration vessels. The technical guidelines were completed and were recommended for review and adoption by the Fourth Consultative Meeting of the London Dumping Convention.

MarAd was represented at a session of the IMCO Subcommittee on Bulk Chemicals held in London from September 10 to September 14, 1979. Major items discussed at this session included an evaluation of hazards of bulk chemicals, carriage of Annex I and Annex II substances of the 1973 Marine Pollution Convention, implementation of Annex II requirements of the 1973 Convention, and handling in ports of liquid chemicals and liquefied gases.

The Resumed Eighth Session of the Third United Nations Conference on the Law of the Sea (LOS) was held in New York from July 16 to August 24, 1979. The session ended with the issuance of reports by the committee chairmen that reflect substantial progress toward agreement on most outstanding issues. The Conference decided to hold what may be its final substantive session in two 5-week stages in 1980, the first in New York beginning February 27, and the second in Geneva beginning July 28. The new texts on deep seabed mining moved significantly toward a consensus that can accommodate the objective of establishing a viable international seabed mining enterprise with that of assured access for states and their nationals under reasonable terms and conditions. With the successful conclusion of the eighth session, completion of the LOS treaty now awaits resolution of the remaining problems regarding deep seabed mining and finalization of the amendments on marine scientific research and marine mammals.

The UNCTAD meetings included an Ad Hoc Intergovernmental Group on Container Standards and UNCTAD 5. At UNCTAD 5, the Code of Conduct for Liner Conferences was approved. However, a move to establish a code for bulk carriers was defeated.

During FY 1979 MarAd also took part in meetings of the Maritime Transport Committee of the OECD. These sessions included discussions of assistance to shipbuilding and shipping flags of convenience, Eastern bloc shipping, and the UNCTAD Code of Conduct for Liner Conferences.

Additionally, MarAd representatives attended European Community meetings on transportation and Soviet shipping; plenary sessions and exercises of NATO's Planning Board for Ocean Shipping, and NATO Working/Study Groups on Plans Review, Freight Rates, Shipping War Losses, and Naval Shipping; an extraordinary meeting of the Permanent Technical Committee on Ports of the Organization of American States; and international conferences on liquefied natural gas, transportation, marine simulators, computer simulators, and marine propulsion and future fuels.

Representatives of this Agency also attended the 5th Interamerican Port and Harbor Conference, the Canadian 2nd National Marine Conference, a joint conference of the Lake Carriers Association and the Dominion Marine Association, and the Technical Committee of the American Association of Port Authorities.

In addition, MarAd representatives attended nongovernmental international conferences during the year. Among these was the 7th triennial International Ship Structures Congress, which was organized in 1961. Its purpose is to give international experts engaged in ship and marine structure research an opportunity to meet and discuss technical matters of common interest, including research in progress or contemplated. It recommends further research, especially when cooperation between countries is advantageous. This meeting emphasized ship collisions and groundings and research on offshore oil and gas structures.

The 3rd International Conference on Computer Applications in the Automation of Shipyard Operations and Ship Design also was attended by MarAd representatives. The 42 papers presented discussed computer-aided ship design; computer-aided ship production, information systems for shipbuilding, graphics and communications in ship technology; and general topics in ship technology.

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.

Chapter 11

Administration

Maritime Subsidy Board

The Maritime Subsidy Board (MSB), by delegation from the Secretary of Commerce, awards, amends, and terminates contracts subsidizing the construction and operation of U.S.-flag vessels in the foreign commerce of the United States. To perform its functions, the MSB holds public hearings, conducts fact-finding investigations, and compiles and analyzes trade statistics and cost data. Its actions are final unless reviewed by the Secretary of Commerce.

The Assistant Secretary of Commerce for Maritime Affairs is ex officio Maritime Administrator and chairs the MSB. The other permanent board members are the Deputy Assistant Secretary and MarAd's General Counsel. The Secretary to MarAd and the MSB acts as an alternate member in the absence of any of the three permanent board members.

Samuel B. Nemirow, Assistant Secretary of Commerce for Maritime Affairs, signs for Federal Government as three-way agreement is sealed on $69.8-million subsidized contract for Sun Shipbuilding and Dry Dock Co., Chester, Pa., to build third Roll-On/Roll-Off-containership for Waterman Steamship Corp., New York, N.Y. Edward P. Walsh (left), Waterman President, and Joseph J. Kleschick (right), Sun Vice President, signed for their companies.

The MSB met 50 times during fiscal year 1979. It considered and acted on 550 items and issued 27 formal opinions, rulings, and orders. It also published 72 notices in the *Federal Register* on such matters as hearings required under the Merchant Marine Act of 1936, as amended, and other statutes, and the development and adoption of implementing rules and regulations.

Two final MSB decisions, both served December 8, 1978, found that Section 605(c) of the 1936 act was no bar to the award of requested 20-year operating-differential subsidy (ODS) agreements. Involved were an application by States Steamship Co. (Docket No. S-447) for service on Trade Routes (TRs) 17 and 29, between U.S. Pacific ports and ports in Indonesia, Malaysia, Singapore, and the Far East; and an application from Lykes Bros. Steamship Co., Inc. (Docket No. S-451), for service on TRs 13, 15-B, 17, 21, 22, and 31, between U.S. Gulf ports and a variety of ports in Europe, Africa, South America, and Asia.

Section 605(c) prohibits the award of subsidy for operations that would be in addition to existing U.S.-flag service unless it is determined that U.S.-flag service is inadequate and that the addition of vessels on the service would further the purposes and policy of the act. Also prohibited are new subsidy contracts that would give undue advantage to one U.S. citizen over another unless necessary to provide adequate U.S.-flag service.

Other actions of interest taken by the MSB during the period included the approval on June 15, 1979, on a 1-year experimental basis, of the application of Aeron Marine Shipping Co. to amend its ODS contract to permit two vessels to carry certain dry-bulk cargo under the preference laws of the United States. The approval was the first step toward eventually eliminating the carriage of preference cargoes at premium rates.

On January 29, 1979, the board approved the acquisition by Lykes Bros. Steamship Co., Inc., of the Roll-On/Roll-Off (RO/RO) vessel SS ARIZONA, and the charter of the RO/RO vessels SSs MAINE and NEVADA, all formerly owned and operated by States Steamship Co. In addition, the board granted Lykes' request to operate these and certain other vessels on TRs 29 and 17, and its request for transfer and interchange privileges.

Through the *Federal Register*, the board gave public notice of, and invited comments on, the following items of major interest:

- Proposed standard forms of contract to be used in the award of construction-differential subsidy (CDS) under Title V of the 1936 act;
- A proposed policy to govern the total repayment of CDS by vessel owners;
- Proposed regulations for the payment of CDS to operators of dry-bulk vessels;
- Changes to make more flexible the financial requirements ODS operators must meet before declaring dividends; and
- Proposed amendments designed to simplify and expedite Section 605(c) hearings.

In addition, the board published as a matter of information its policy with respect to granting interchange and transfer privileges to subsidized liner operators. These privileges permit the substitution or exchange of vessels among different services under certain circumstances.

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 prepare initial or recommended decisions. Cases are referred to ALJs by the Assistant Secretary of Commerce or the MSB.

At the beginning of the reporting period, 33 proceedings were pending before the ALJs. Of these, 19 involved ODS and 14 concerned appeals of final decisions of contracting officers in disputes between shipowners or shipyards and the Maritime Administration, including the board.

In the course of the year, only one additional case, a contract appeal, was referred for hearing. Of the total docket, 16 initial decisions were issued and hearings were completed in another two cases. Three proceedings were either settled, withdrawn, or dismissed, while 11 were returned to the MSB for final decisions.

Twenty cases were pending before the ALJs at the close of FY 1979.

Legal Services, Legislation, and Litigation

In addition to serving on the Maritime Subsidy Board (as noted above), the General Counsel of the Maritime Administration provides legal services to the Assistant Secretary, the board, and the Agency's various offices and divisions. A substantial portion of this effort in FY 1979 related to maritime aid programs, other programmatic activities, domestic and international shipping matters, rulemaking, legislation, and litigation.

A major legislative effort during the period was the submittal to Congress of a program to stimulate the development of a U.S.-flag dry-bulk fleet. The proposal would liberalize current statutory restrictions on the foreign sale of bulk carriers built with subsidy, the repair of subsidized bulkers in foreign shipyards, and the ownership of foreign-flag bulk carriers by owners of subsidized U.S.-flag bulk carriers.

The Assistant Secretary and other Agency representatives presented views to Congressional committees on a significant number of other maritime proposals introduced during the reporting period. (A summary of major FY 1979 maritime legislation appears at the start of this report.) The Agency also assisted in formulating the departmental position on efforts by State governments to control ship emissions.

Regulations establishing items eligible for payment of ODS were revised during FY 1979. As a result, for the first time operators can obtain advance determinations of per diem subsidy for many ships operated under time charter.

Efforts continued to develop standardized CDS contracts to clarify the rights of all parties, reduce legal costs, and encourage the participation by small companies which may be unfamiliar with procedures for developing CDS contracts.

Other significant projects and activities for which substantial legal support was provided included:

- The use of Capital Construction Fund deposits as collateral for notes used to provide interim financing for ships under construction. (This new technique provides operators with added flexibility in corporate finances.)
- Consolidating for renewal ODS contracts previously held separately by one operator and another whose assets it absorbed.
- Comprehensive revision of the Agency's maritime training regulations.
- Transfer of the Liberty ship SS JEREMIAH O'BRIEN from the National Defense Reserve Fleet to the Department of the Interior for use as a museum ship (see Chapter 9).

Management Initiatives

During FY 1979 MarAd absorbed a ceiling reduction of 36 permanent positions. Staffing adjustments were made in Agency activities to reflect changing program priorities and shifting workload patterns.

In addition, MarAd implemented improved ship preservation procedures and revised staff allowances at its three National Defense Reserve Fleet sites, allowing the reprogramming of 26 positions to the new Ready Reserve Fleet Program. During the period an improved workload reporting system for the fleets was developed, to be implemented in FY 1980.

In FY 1979 MarAd's Office of Civil Rights was abolished; its contract-compliance functions and personnel were transferred to the Department of Labor.

In recognition of the importance of the control of marine pollution, the Agency established as a formal organizational entity a Division of Environmental Activities.

Audits

The Office of the Inspector General, Department of Commerce, submitted to MarAd two internal audit reports: the Audit of Compliance with Treasury Circular No. 1082 (Notification to States of Grant-In-Aid Information) and the Review of Compliance with Guidelines for Control of Discount Airline Coupons.

The General Accounting Office submitted one report, *The Maritime Administration and the National Maritime Council—Was Their Relationship Appropriate?*

MarAd agreed with the recommendations in these reports and has taken appropriate action to implement them.

Financial Analysis

Through the use of MarAd's Financial Information and Retrieval System (FIRST), several analytical reports were developed for use by the Agency and companies in the liner industry.

One report measures each operator's expense components against total operating expense and against total operating revenue. These expense-ratio profiles are compared over time both for individual vessel types on various trade routes and for a company as a whole.

A second report measures and compares revenue per freight-payable ton by vessel type on various trade routes, and a third summarizes overall financial performance by vessel type on U.S.-flag liner trade routes.

Also during FY 1979, four studies were begun to help define the financial environment in which U.S.-flag liner companies operate. These studies are to:

- Measure the impact of inflation on balance sheets and income statements of U.S.-flag liner companies.
- Develop a standard definition of "return on investment" on a trade route basis, including allocation principles for investments shared among trade routes.
- Investigate whether, and with what limitations, the economic performance of countries on a given trade route can be used to forecast revenue generation of carriers on the route.
- Develop an alternative to revenue forecasting based on projections of cargo tons, commodity mix, and tariff rates.

During the year the Agency completed the design of a new system to create a data base similar to FIRST but containing financial information related to deepdraft, liquid and dry-bulk carriers, barge and inland waterways carriers, and the drill rig and supply boat industries. The new system, called FIRST XI, is being developed in tandem with the redesign of MarAd Form MA-172 to reduce and simplify reporting requirements of companies holding Title XI loan-guarantee agreements.

Management Information

The Maritime Administration continued to expand the use of automation in the management and support of its programs during this reporting period. In addition to developing many new computer systems, the Agency substantially increased its use of automated techniques for analytical, forecasting, and planning work, including the production of graphics.

Equipment additions for the computer system were converted from lease to purchase, with significant savings to the Government over a 5-year period. A new central processor unit was acquired.

Computer analysis, programming, and training services were provided to other Agencies of the Department of Commerce for the Employee Information System developed by MarAd. The interactive system, operated through terminals in personnel offices, has been adopted for departmental use and for use by selected Agencies.

During FY 1979 the Agency implemented a variable Manpower Supply and Demand Model to develop attrition rates for the existing maritime workforce over projected periods and to estimate future shipboard workforce demand.

Two innovative nationwide computer-based information systems were developed as part of the Commercial Development Port Emergency Planning Program. The Port Facilities Inventory System uses data collected by MarAd's regional offices about all U.S. ports and the characteristics of their cargo-handling terminals. The system enables ready acquisition of information through telephone terminals and allows data manipula-

tions for analytical and planning purposes. The Emergency Berth Utilization Reporting System uses the same data base to assist the National Shipping Authority in making decisions regarding the berthing of ships. It provides telecommunications support for up to 21 regional and local port controllers.

Also during the year, developmental work and specifications were completed for the automation of administrative functions of the U.S. Merchant Marine Academy. Planned first is the automation of the nominations and admissions process, followed by an automated registrar system to include scheduling, grading, record maintenance, and degree auditing.

Personnel

New Assistant Secretary

On July 18, 1979, the Senate confirmed President Carter's nomination of Samuel B. Nemirow to succeed Robert J. Blackwell as Assistant Secretary of Commerce for Maritime Affairs. A MarAd employee since 1972, Mr. Nemirow had served as the Agency's General Counsel and, most recently, as Deputy Assistant Secretary for Maritime Affairs. Mr. Blackwell, who became Assistant Secretary on August 7, 1972, resigned effective April 9, 1979.

Employment

Total employment in the Maritime Administration decreased from 1,464 to 1,456 in FY 1979.

Minority employees represented 27 percent of the total workforce, occupied 17 percent of the supervisory positions, and held 9 percent of the GS-12 and above positions.

The number of female employees increased from 471 to 474. Women occupied 14 percent of the supervisory positions, and 9 percent of the GS-12 and above positions.

Training

During the reporting period, the combined total MarAd employee attendance at formal Agency-sponsored training programs surpassed 1,700.

Emphasis continued to be placed on in-house training, which provides significant cost savings and better opportunity for evaluation. Forty-three courses were offered within the Agency's facilities during FY 1979.

The increased availability of non-traditional instruction methods, such as programmed texts and video and audio tapes, made it possible for more employees to receive training at minimal cost.

Awards

Top honors were awarded to 11 MarAd employees during the reporting period. One Gold Medal and 4 Silver Medals, the Department's highest awards, and 6 Bronze Medals, MarAd's highest honor award, were presented. In addition, four employees were recognized for their contributions to the Equal Employment Opportunity Program.

Performance awards were granted to 128 Maritime Administration employees, including 42 Quality Step Increases and 86 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 Kearney, N.J.; the U.S. Merchant Marine Academy at Kings Point, N.Y.; and the Wilmington, N.C., Maritime Facility.

Radar training schols are operated at 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.; 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.

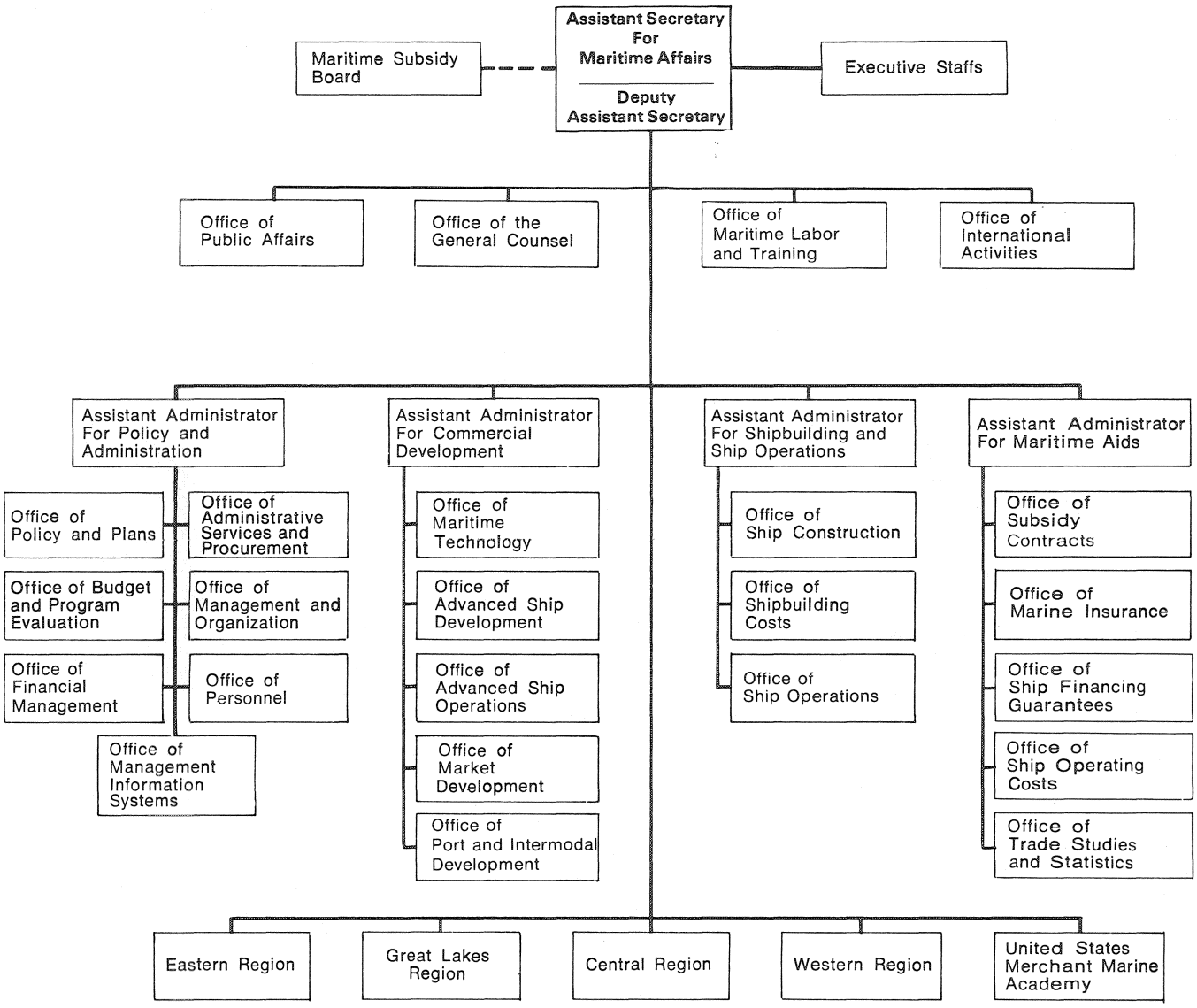
MarAd's Hokoben, N.J., terminal continued under lease to the Port Authority of New York and New Jersey.

Accounting

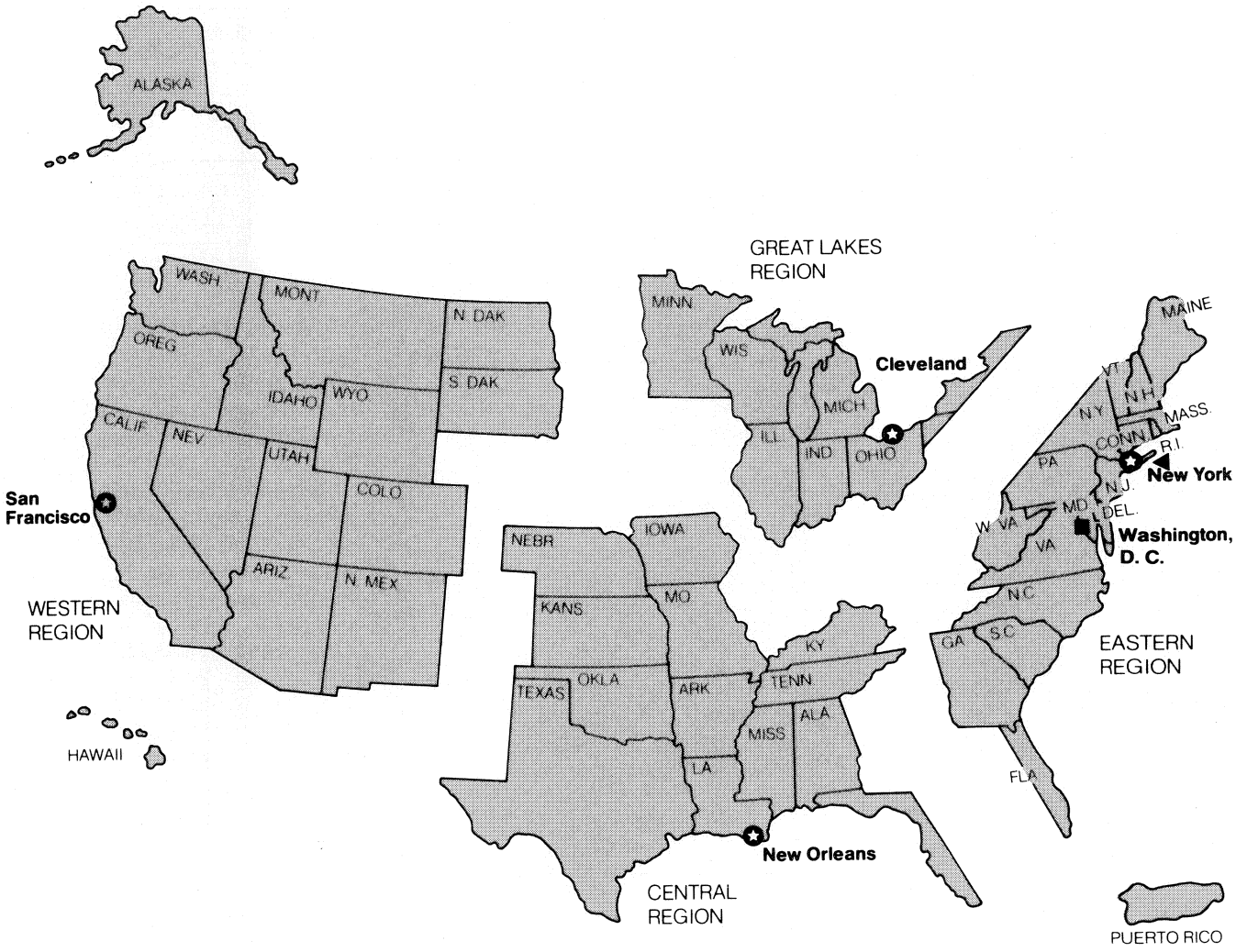
The accounts of the Maritime Administration were maintained on an accrual basis and in conformity with generally accepted accounting principles and standards, and related requirements prescribed by the Comptroller General. The cost of combined operations of the Maritime Administration for the year totaled $567.2 million. This included $521.4 million for ODS and CDS, $12.6 million for research and development, $28.7 million for administrative expenses, $5.5 million for maintenance and preservation of Reserve Fleet vessels, and $5.6 million for financial assistance to State maritime academies. MarAd received $19.5 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



■ MarAd Headquarters

✪ Region Headquarters

▲ U.S. Merchant Marine Academy
Kings Point, N.Y.

FINANCIAL STATEMENTS

U.S. Department of Commerce—Maritime Administration

Exhibit 1. Statement of Financial Condition

September 30, 1978, and September 30, 1979

ASSETS	September 30 1979	September 30 1978
Selected Current Assets		
Fund Balances with Treasury:		
Budget Funds	$ 614,643,201	$ 708,985,732
Deposit Funds	861,246	195,526
Allocation from Other Agencies	6,094,182	4,754,791
Budget Clearing Accounts	—	—
	621,598,629	713,936,049
Federal Security Holdings	100,096,000	71,741,000
Accounts Receivable:		
Government Agencies	2,090,416	2,438,913
The Public	3,061,450	12,829,484
Allowances (—)	—889,241	—171,216
	4,262,625	15,097,181
Advances To:		
Government Agencies	—	74,907
The Public	110,997	93,841
	110,997	168,748
Total Selected Current Assets	**$ 726,068,251**	**$ 800,942,978**
Loans Receivable:		
Repayment in Dollars	131,926,664	125,465,129
Allowances (—)	—55,940,522	—45,950,888
	75,986,142	79,514,241
Inventories		
Raw Material and Supplies	5,508,416	5,574,648
Real Property and Equipment:		
Land	5,811,757	5,898,348
Structures and Facilities	39,218,895	38,716,372
Equipment and Vessels	1,297,392,741	1,331,947,439
Leasehold Improvements	92,119	92,119
Allowances (—)	—1,249,598,999	—1,286,276,682
	92,916,513	90,377,596
Other Assets:		
Work-in-Process-Other	6,340,651	5,386,563
Materials and Supplies	740,526	727,319
Non-Current Assets	4,221,991	1,786,360
Notes Receivable	26,801,418	26,912,069
Allowances (—)	—121,102	—749,244
	37,983,484	34,063,067
Total Assets	**$ 938,462,806**	**$1,010,472,530**

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 1979	September 30 1978
Selected Current Liabilities (Note 2):		
Accounts Payable (including Funded Accrued Liabilities):		
Government Agencies	$ 1,541,650	$ 1,273,003
The Public	190,951,020	170,381,490
	192,492,670	171,654,493
Advances From:		
Government Agencies	6,094,182	4,547,089
The Public	15,907,114	16,247,809
	22,001,296	20,794,898
Total Selected Current Liabilities	**$ 214,493,966**	**$ 192,449,391**
Deposit Fund Liabilities	861,246	195,526
Unfunded Liabilities:		
Accrued Annual Leave	2,748,437	2,719,351
Other Liabilities:		
Vessel Trade-In Allowance	16,045,465	641,777
Total Liabilities	**$ 234,149,114**	**$ 196,006,045**

Government Equity

Unexpended Budget Authority:		
Unobligated	164,836,639	395,547,385
Undelivered Orders	477,523,420	272,725,383
	642,360,059	668,272,768
Unfinanced Budget Authority (—):		
Unfilled Customer Orders	—1,704,663	—
Contract Authority	—129,942,357	—59,974,707
	—131,647,020	—59,974,707
Invested Capital	193,600,653	206,168,424
Total Government Equity	**$ 704,313,692**	**$ 814,466,485**
Total Liabilities and Government Equity	**$ 938,462,806**	**$1,010,472,530**

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, 1979, and September 30, 1978	Years Ended September 30	
	1979	**1978**
Balance Beginning of Fiscal Year	$ 814,466,485	$ 862,601,484
Additions:		
Funds Appropriated by Congress	482,391,000	561,575,000
Deductions:		
Net Cost of Combined Operations (Exhibit 3)	567,179,448	531,148,725
Payments into General Funds Receipts	11,400,049	75,619,101
Property Capitalized without Use of Funds	11,084,311	—
Property Transferred and Donations	2,254,985	2,736,173
Appropriation Transferred Out	625,000	206,000
	$ 592,543,793	$ 609,709,999
Balance, Close Accounting Period (Exhibit 1)	**$ 704,313,692**	**$ 814,466,485**

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, 1979

	Years Ended September 30	
	1979	**1978**
OPERATIONS OF MARITIME ADMINISTRATION:		
Net Costs of Operating Activities		
Reserve Fleet Programs:		
Depreciation on Vessels	$ 341,455	$ 378,464
Maintenance and Preservation	5,464,246	4,245,954
	5,805,701	4,624,418
Maritime Training Program	12,934,502	12,536,100
Maintenance of Shipyard and Warehouses	8,667	9,763
Direct Subsidies and National Defense Cost:		
Operating-Differential Subsidies	319,967,661	370,566,015
Construction-Differential Subsidies	201,495,276	101,910,289
Cost of National Defense Features	2,207,730	647,679
	523,670,667	473,123,983
Administrative	28,568,685	28,313,196
Research and Development	12,611,509	15,397,801
Financial Assistance to State Marine Schools	5,609,905	4,896,185
	46,790,099	48,607,182
Other Costs (Net of Income)	1,097,130	—1,590,422
Net Cost of Maritime Administration Operations	**590,306,766**	**537,311,024**
OPERATIONS OF REVOLVING FUNDS (—Income):		
Vessel Operations Revolving Fund	2,898,405	—210,466
War-Risk Insurance Revolving Fund	—444,156	—382,094
Federal Ship Financing Fund Revolving Fund	—25,581,567	—5,569,739
Net Cost of Combined Operations (Exhibit 2)	**$ 567,179,448**	**$ 531,148,725**

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

Notes to Financial Statements—September 30, 1979, and September 30, 1978

1. The preceding financial statements include the assets, liabilities, income, and expenses of the Maritime Administration; the Vessel Operations Revolving Fund; the War-Risk Insurance 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 $5,438,498,665 on September 30, 1979, and $5,167,780,523 on September 30, 1978. Commitments to insure additional loans and/or mortgages amounted to $938,459,219 on September 30, 1979, and $433,202,725 on September 30, 1978. U.S. Government securities and cash of $265,121,307 on September 30, 1979, and $353,818,540 on September 30, 1978, 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, 1979.

On September 30, 1979, the U.S. Treasury held in safekeeping for the Maritime Administration $180,000 of U.S. Government Securities which had been accepted from vessel charterers, subsidized operators, and other contractors as collateral for their performance under contracts. On September 30, 1978, the amount was $130,000.

3. Contingent assets in the amount of $1,266,235, proceeds from the sale of construction materials, are not reported in the financial statements.

Appendix I: MARITIME SUBSIDY OUTLAYS—1936-1979

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	299,469,419
1966	69,446,510	2,571,566	72,018,076	186,628,357	258,646,433
1967	80,155,452	932,114	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	412,279,487
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
1979	198,518,437	2,258,492	200,776,929	300,521,683	501,298,612
Total	**$2,873,082,199**	**$199,654,381**	**$3,072,736,580**	**$5,482,653,606**	**$8,555,390,186**

[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, 1978 (Amounts Stated in Thousands of Dollars)

ASSETS	
Current Assets:	
Cash	$ 28,332
Marketable Securities	105,939
Accounts Receivable	306,841
Other Current Assets	55,788
Total Current Assets	496,900
Special Funds and Deposits	207,501
Investments	23,537
Deferred ODS Receivable (See Contra) [2]	(31)
Property and Equipment Less Depreciation:	
Vessels	928,367
Other Property and Equipment	111,952
Other Assets	151,179
Voyages in Progress-Net	-0-
TOTAL ASSETS	**$1,919,405**
LIABILITIES AND NET WORTH	
Liabilities:	
Current Liabilities:	
Accounts and Notes Payable	$ 222,259
Current Long-Term Debt	64,180
Other Current Liabilities	139,965
Total Current Liabilities	426,404
Voyages in Progress-Net	57,742
Long-Term Debt	625,875
Recapture ODS (See Contra) [2]	(31)
Other Liabilities	167,374
Total Liabilities	1,277,364
Net Worth:	
Capital Stock	89,025
Surplus:	
Paid in Capital	166,585
Retained Earnings	386,431
Total Surplus	553,016
Total Net Worth	642,041
TOTAL LIABILITIES AND NET WORTH	**$1,919,405**

Statement B—Combined Condensed Income and Surplus Accounts Year Ending December 31, 1978)
(Amounts Stated in Thousands of Dollars)

Shipping Operations:	
Revenue:	
Terminated Voyages	$1,627,054
Other Shipping Operations	1,203
Total Revenue	1,628,257
Expenses:	
Terminated Voyage Expense:	
Wages, Payroll Taxes, Welfare Contributions	355,915
Subsistence	16,035
Maintenance and Repair	93,174
Insurance (Hull and P & I)	79,639
Total	544,763
Less: Operating-Differential Subsidy (ODS)	279,487
Total	265,276
Other Vessel Expense	279,502
Voyage Expense	725,488
Total Terminated Voyage Expense	1,270,266
Other Shipping Operations Expense:	
Overhead	180,219
Depreciation on Shipping Property	58,150
Other Miscellaneous Shipping Expense	14,534
Total Expense	1,523,169
Gross Profit from Shipping Operations	105,088
Interest and Other Income	36,113
Interest and Other Deductions	(68,372)
Net Profit from Shipping Operations	72,829
Non-Shipping Operations-Net Profit	6,453
Ordinary Income before Federal Income Taxes	79,282
Provisions for Federal Income Taxes	17,028
Ordinary Income After Taxes	62,254
Extraordinary and Prior Period Items:	
Extraordinary Items-Net Income (Net Expense)	4,735
Federal Income Taxes Thereon (Net Expense)	—
Total	4,735
Net Income	66,989
Add: Paid in Capital and Retained Earnings Beginning of Year	562,157
Total Surplus Available	629,146
Surplus Changes:	
Cash Dividends	74,991
Other (Net)	1,139
Total	76,130
SURPLUS (CAPITAL AND EARNED) END OF YEAR	**$ 553,016**

NOTES TO STATEMENTS A AND B

[1] The data were obtained from Forms MA-172 filed by 18 subsidized companies.

[2] Represents ODS recapturable by Government pending settlement of 10-year subsidy recapture period.

Project	Task	Vendor	Contract Number	Amount[1]
	Advanced Ship Development			
Shipbuilding Research:				
Outfitting & Production Aids *	To develop a national shipbuilding performance program as recommended by the Ship Production Committee of SNAME.	Todd Shipyard Corp. Seattle, Wash.	2-36233	$473,000
Research & Engineering Applied to Productivity in Shipbuilding *	To develop a computer-based system to fabricate and produce geometric shapes of steel for use in shipbuilding.	Newport News Shipbuilding, Newport News, Va.	7-38061	368,000
Methods to Improve U.S. Shipbuilding Productivity	Conduct studies of foreign shipbuilding technologies and determine their suitability for transfer to U.S. shipyards.	IITRI Chicago, Ill.	9-00077	95,000
Shipbuilding Productivity *	To identify Japanese shipbuilding technology suitable for adoption by medium-sized U.S. shipyards, and to examine institutional changes that could increase U.S. shipbuilding productivity.	Levingston Shipbuilding Orange, Tex.	8-3036	1,307,000
Research & Engineering For Automation & Productivity in Shipbuilding *	To develop advanced shipyard manufacturing techniques employing automated computer based systems to perform critical functions of shipbuilding.	IITRI, Chicago, Ill.	5-38072	278,000
Shipyard Labor Assessment	To provide U.S. shipyards an automated data base of shipbuilding cost elements related to repair and new construction.	Systems Consultants, Inc. Washington, D.C.	9-00050	89,000

[1] "Amount" = MarAd funding in FY 1979.
* Asterisk indicates project is cost-shared. See Chapter 6.

Anchor chain covers dock at Bethlehem Steel Corp. shipyard.

Project	Task	Vendor	Contract Number	Amount
Ship Machinery Outfitting:				
Diesel Propulsion for Ships	To evaluate the utilization of low speed propulsion systems for commercial containerships.	Baham Corp. Columbia, Md.	9-00068	$ 33,900
Steam Propulsion Control System	To simulate steam turbine throttle control systems in failure modes in order to develop specifications for new advanced technology for merchant vessels centralized steam throttle control systems.	Systems Control, Inc. Palo Alto, Calif.	9-00040	127,800
Contra-Rotation System Design	A series of studies and design analyses to insure system performance of the contra-rotating propeller concept.	Sun Shipbuilding Chester, Pa.	7-38068	12,400
Contra-Rotation Propeller Model Test	To conduct model tests of the contra-rotating ship propeller.	David Taylor Naval Research & Development Center Bethesda, Md.	400-99004	14,000
Improved Marine Boiler Reliability	To fabricate, install, and conduct sea tests of marine boiler probes.	Combustion Engineering, Windsor, Conn.	6-38088	14,800
Improved Diesel Propulsion *	To conduct sea tests of emulsified fuels in marine boilers.	Seaworthy Systems Essex, Conn.	7-38058	89,000
Atomization Impovement Mod. 2 and Mod. 3	To conduct shoreside full scale testing of techniques to improve atomization of marine burners on heavy fuels and to employ laser instrumentation for the measurement of atomization improvement, particle size, and improvement.	Combustion Engineering Windsor, Conn.	7-38010	166,300
Steering Gear Reliability	To investigate alternative concepts for application to shipboard hydraulic steering systems.	Transmission Technology Fairfield, Conn.	9-00043	148,400
Sensors/Instrumentation—State-of-the-Art	To develop criteria (performance, reliability, and operation) for sensor/instrumentation used in critical shipboard automation and control systems.	Southwest Research Institute San Antonio, Tex.	9-00031	279,700
Shipboard Uptakes and Gas Takeoffs	Study the role of gas uptakes and takeoffs in supplying inert gas systems by the use of modeling techniques.	Southwest Research Institute San Antonio, Tex.	9-00026	121,900
Auxiliary and Support Piping	The application of nondestructive testing techniques to identify degradation/failure of cargo piping.	Daedalean Associates Woodbine, Md.	9-00070	209,000

* Cost-shared.

Appendix III: (Continued)

Project	Task	Vendor	Contract Number	Amount
Industrial Plant Vessels:				
Assessment of Industrial Plant Vessels for Municipal Services	To assess the applications of floating industrial plant vessels as potential prospects for the U.S. shipbuilding industry.	Global Marine Development, Inc. Irvine, Calif.	9-00080	$118,000
Offshore Technology Energy Conversion Plantship Design	To conduct a preliminary investigation of open-cycle hull systems and identify potential commercial use.	Westinghouse Electric Corp. Philadelphia, Pa.	9-00063	137,000
Waterborne Platforms for Processing Sludge	To conduct a feasibility study of waterborne platforms for processing/ disposal of sewage sludge.	TRS Associates Columbia, Md.	9-00057	34,000
Waterborne Alcohol Production Plant	To conduct a feasibility study to examine alternative alcohol fuels to be manufactured at sea or offshore and evaluate the economics related to the candidate process.	International Maritime Associates Washington, D.C.	9-00078	204,000
Nuclear Ships:				
Math Model for Impact Loads	Develop a math model to estimate crushing loads on ships' bows in collisions.	Hydronautics Laurel, Md.	9-00004	56,700
International Nuclear Standards	To continue the development of proposed standards pertaining to the handling of ships for consideration before international bodies.	Ship Analytics Old Mystic, Conn.	8-3014	9,400
Ship Accident Study	A study to calculate the maximum impact forces that would be encountered on a collision barrier of merchant vessels.	George G. Sharp, Inc. New York, N.Y.	7-38028	24,600

Project	Task	Vendor	Contract Number	Amount
	Advanced Ship Operations			
Fleet Management:				
Tankbarge Management Information System	To conduct a feasibility study to develop an automated, real-time river barge "trip" record system.	National Marine Service St. Louis, Mo.	9-00055	$ 76,616
Shipboard Management Information System	To identify specific shipboard information needs (crew lists, supply manifests, fuel consumption reports, etc.) that could be handled by advanced information processing technology and devise ways to develop such capabilities.	Marine Management Systems, Inc. Stamford, Conn.	9-00046	349,576
Fleet Management Technology Center	To determine the requirements to establish shipping management technology centers as a means of utilizing the advanced technological developments of shipping management systems.	Delta Steamship Lines, Inc. New Orleans, La.	9-00108	87,250
		Lykes Bros. Steamship New Orleans, La.	9-00060	130,750
		Autoliners, Inc. New York, N.Y.	9-00109	30,000
Cargo Handling:				
Sealift Strongback Spreader	To conduct engineering design for the "Strongback Spreader" for use on the Sea-Shed.	M. Rosenblatt and Son New York, N.Y.	8-3057	5,000
Grain Handling & Storage	To examine and compare methods for reducing shipboard grain damage caused by impact of kernel against ship's structure during loading and compare alternative methods for reducing grain dust.	J.A. Johnson, Inc. Plainfield, N.J.	9-00071	41,683
Cargo Measurement of Tank Vessels	To perform tests on the adaptability of a SONAR Oil Thickness Sensor (SOTS) for cargo measurement and ballast control on tankers.	University of Rhode Island Kingston, R.I.	9-00090	9,500
Sealift Containership Readiness	To develop profiles of three vessel types used as commercial containerships with alternate capability to meet military sealift readiness requirements.	Information Spectrum, Inc. Arlington, Va.	9-00073	64,960
Ship Performance and Safety:				
Hull Roughness Standards	To develop technology to measure ships' hull roughness, ship standards and cleaning and coating procedures; and upgrade quality control standards in ship construction.	Santa Fe Corp. Alexandria, Va.	9-00052	$107,542

Project	Task	Vendor	Contract Number	Amount
Ship Casualty Analysis	Analyze U.S. and foreign ship casualty data with special emphasis on collision casualties. Evaluate various collision avoidance systems in light of casualty analysis.	Marine Index Bureau New York, N.Y.	MA5-0091	148,444
Precise Maneuvering and Docking	To demonstrate a system to provide improved maneuvering and docking utilizing the inputs obtained from ships radar gyroscope.	American Steamship Co. Buffalo, N.Y.	9-00029	99,000
	Port & Intermodal Development			
Tug Forces Math Model	To develop and install tugboat simulation capability as a function of the CAORF system.	Sperry Systems Management Great Neck, N.Y.	MA5-0032	43,814
Virginia State Port Study	To analyze cargo demand, terminal capacity and future needs of Virginia ports, and to investigate the role of the Virginia Port Authority in the development of the State's commerce and ports.	Virginia State Port Authority Richmond, Va.	9-00042	65,000
Hawaii Cooperative Port Planning *	To develop an economic framework from which statewide port planning, and State transportation needs can be measured to develop future State transportation requirements.	State of Hawaii Dept. of Transportation Honolulu, Hawaii	9-00075	$75,000
Metropolitan Transportation Commission/Bay Conservation and Development Commission	To assist in developing the future needs of the entire San Francisco Bay area to provide for adequate port development and to protect the ecology of shoreline.	City of San Francisco, Calif.	9-00081	50,000
Public Port Liability Insurance Study	To examine and study "risk pools" of captive insurance companies for use by port associations.	Pacific Coast Ports Association San Pedro, Calif.	9-00025	49,481
Study of the Port of Detroit *	To conduct research to provide timely planning, management, and investment data relative to future waterfront development for certain areas of the Great Lakes Region.	City of Detroit, Mich.	9-00093	75,000
Regional Economic Impact Model of Port Activities	To produce a prototype analysis of the economic impact of a waterport on a regional area and develop a detailed methodology to employ the input/output model in other regional port areas.	The Port Authority of New York and New Jersey New York, N.Y.	9-00094	99,300

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
	Advanced Maritime Technology			
Advanced Ship Systems:				
Next Generation Cargo Liner*	To examine industry requirements for development of a preliminary design for an advanced technology cargo liner.	J. J. Henry Seattle, Wash.	6-38060	$ 97,725
Standardized Dry-Bulk Carrier	To develop the requirements and implementation plan needed to create industry demand for a standardized U.S.-flag dry-bulk carrier.	M. Rosenblatt & Son, Inc. Arlington, Va.	7-38053	83,129
Forecasting U.S.-Flag Operations in Merchant Shipping	To develop a computer model capable of determining and projecting the U.S.-flag fleet's requirements to serve U.S. foreign trade.	Pugh-Roberts Associates, Inc. Cambridge, Mass.	9-00072	130,000
Fleet Forecasting Model	To provide a U.S. merchant fleet forecast system to enable MarAd to produce a 25-year fleet forecasting requirement for U.S. foreign trade.	Temple, Barker and Sloane Lexington, Mass.	9-00074	130,000
Pacific Bulk Commodity Transfer *	To conduct assessment studies and definition of the recommended system design of alternate coal slurry systems for the export of coal.	Boeing Engineering and Construction Div. Seattle, Wash.	8-3038	95,980
Mobilization Ship Design	To develop production drawings for a ship capable of being mass produced during a national emergency.	M. Rosenblatt & Son New York, N.Y.	9-00064	768,059
Mobilization Ship Model Test	To perform ship model tests and analysis of the hull form for the Security Class PD-214 Ship Design for Mobilization	Hydronautics, Inc. Laurel, Md.	9-00053	91,200
Mobilization Ship Production and Scheduling Cost Study	To perform research of foreign production schedules, cost estimates, and production schedules for contractors of the mobilization ship in Japan.	Kawasaki Heavy Industries Kobe, Japan	9-00053	98,000
Forecasting Future Maritime Fleets *	To determine the effect that future cargo quantities and the mix of maritime vehicles will have on MarAd and Coast Guard R&D programs.	Forecasting International, Ltd. Arlington, Va.	8-3023	28,440

* Cost-shared.

Appendix III: (Continued)

Project	Task	Vendor	Contract Number	Amount
Marine Science:				
Ship Maneuvering Risk Analysis	To develop new concepts for improving maneuvering performance for LNG ships.	Systems Control, Inc. Palo Alto, Calif.	8-3079	$ 98,830
Ship Motion in Confined Waters	To develop an analytic technique for determining ship seakeeping performance in confined waters.	Austin Research Associates Austin, Tex.	9-00089	36,974
Evaluation of Large Propeller Semi-Tunnel Stern Concept	To examine and analyze the size of propellers located in the stern/tunnel as a means to improve the propulsive efficiency of merchant ships.	David Taylor Naval Research and Development Center Bethesda, Md.	400-99014	210,000
Hull Roughness	To conduct analytic and model studies of hull roughness on merchant vessels.	Sun Shipbuilding Chester, Pa.	9-00007	144,429
Polar Class Ice-Breaking Tests	To conduct icebreaking tests in the Bering Strait and apply the data to commercial merchant ships.	Arctec, Inc. Columbia, Md.	9-00035	84,000
Propeller-Induced Hull Vibration	To develop the major cause of hull vibration surface forces induced by the propeller as it rotates in the uneven wake velocity behind the ship.	Stevens Institute of Technology Hoboken, N.J.	9-00088	95,000
Marine Antifouling	To determine the basic mechanism of the release of toxins in antifouling paints in order to control hull fouling of ship bottoms.	University of New Orleans New Orleans, La.	8-3049	34,942
Reduced Hull Vibration	To analyze the effect of cavitation on hull pressures to develop a prediction technique for hull-vibration analysis.	Massachusetts Institute of Technology Cambridge, Mass.	9-00032	161,408
New Propulsion System Technique	To study a new concept of hydraulic propulsion transmission which is located outside the ship's hull.	Office of Naval Research Washington, D.C.	400-99001	45,564
Tandem Propeller Model Tests	To conduct tests to determine the cost-benefit ratio of adopting the tandem propeller as a single shaft, developing high power to replace more costly multiple-shaft screw arrangements.	David Taylor Naval Ship Research and Development Center Bethesda, Md.	400-89012	27,700
Great Lakes Hull Stress-Warning System	To develop detailed plans and provide arrangements for a prototype stress-warning system for an appropriate Great Lakes vessel.	Hoffman Maritime Consultants Glen Head, N.Y.	9-00048	149,676

Appendix III: (Continued)

Project	Task	Vendor	Contract Number	Amount
Information Exchange:				
Naval Engineers Cumulative Index *	To develop from the Naval Engineers Journal Cumulative Index a data base of abstracts screened from articles of 90 years of publication, and to convert the data base to magnetic tape for transfer to the Maritime Research Information System.	American Society of Naval Engineers New York, N.Y.	9-00092	$ 23,000
University Research:				
LNG Maneuvering	To develop an experimental system of assessing and optimizing for reducing wave production power of ships.	Stevens Institute of Technology Hoboken, N.J.	9-00013	27,111
Urban Passenger Transportation	To develop guidelines for planning and operation of waterborne transportation in urban areas.	Polytechnic Inst. of New York Transportation Training Center Brooklyn, N.Y.	9-00015	45,309
Maximum Strength of Ship Hulls	To develop a reliable method of evaluating the maximum strength of hulls using an analytic and laboratory effort.	Lehigh University Lehigh, Pa.	9-00019	49,695
Ship Wave Resistance	To study the ect of boundary layer and wake on ship's wave-making resistance.	University of Iowa Iowa City, Iowa	9-00017	49,986
Liquid Sloshing	To develop a nonlinear analysis of liquid sloshing in rigid containers (particularly LNG).	Texas A&M Research Foundation College Station, Tex.	9-00018	50,629
Vibrating Propeller Added Mass and Dampening	To conduct a study of propeller added mass and dampening from theory through design equations, and develop a computer program. The data is needed to match recent developments in shafting analysis for high-speed ships.	University of Michigan Ann Arbor, Mich.	9-00012	34,835
Port and Waterfront Development	To develop guidelines and plans for integration of port development and operations with urban waterfront redevelopment.	University of Michigan Ann Arbor, Mich.	9-00016	40,690
Analyzing Marine Accidents	To develop a framework for analyzing ship and marine accidents and examine the potential effects of regulatory changes on the prevention of similar type accidents.	Rensalear Polytechnic Institute Troy, N.Y.	9-00020	49,000

* Cost-shared.

Appendix III: (Continued)

Project	Task	Vendor	Contract Number	Amount
Intercom Communications System for Ships	To develop a system design combining two distinct types of communications systems aboard automated merchant ships to improve the reliability and safety, and reduce the costs of installing and maintaining communications systems aboard ships.	Purdue Research Foundation West Lafayette, Ind.	9-000101	$ 44,932
Biofouling Control Electrochemical Modification Interfaces	To conduct laboratory research of marine bacteria seeking to reduce or prevent fouling in the marine environment.	University of Miami Coral Gables, Fla.	9-00098	49,939
Decision Support for the Outfit Planning Problem	To conduct a pilot test to develop a methodology for solving the outfit planning problems in shipbuilding.	Georgia Institute of Technology Atlanta, Ga.	9-00067	49,236
Evaluation of Fleeting Operations in Port	To develop an evaluation model to optimize harbor fleeting activities at major deepwater and inland ports.	Washington University St. Louis, Mo.	9-00105	49,317
Utilization and Improvement of Experimental Means of Assessing and Optimizing for Reducing Wave Production Power of Ships	To develop a methodology to analyze the effect of bulb and other hull form changes in reducing the wave-production energy loss for modern hull forms.	Webb Inst. of Naval Architecture Glen Cove, N.Y.	9-00106	33,275
Inland Waterway Port Model	To develop an inland waterway port model suitable for use in conjunction with advanced analytical methodologies to plan for future marine transportation requirements for inland waterways.	University of Tennessee Knoxville, Tenn.	9-00103	44,880
Compatibility of Hull Propulsion Shafting of Great Lakes Ore Carriers	To study the contemporary design of lake carriers to analyze the problem of deflections that occur in the propulsion system of typical Great Lakes ore carriers.	University of Michigan Ann Arbor, Mich.	9-00099	48,003
Communications and Navigation:				
Spread Spectrum Application/Test	To demonstrate MarAd's spread spectrum concept through the MARISAT satellite system, and applicability of spread spectrum for terrestrial use.	Magnavox Torrance, Calif.	9-00036	163,682
Communications Technology Support	To provide communications engineering support as required.	Mitre Corp. Alexandria, Va.	9-00065	100,000
NAVSTAR Global Positioning System (GPS) Evaluation	To participate in a three-phase test program to determine the applicability of NAVSTAR GPS to the commercial maritime community.	Department of Transportation System Center Cambridge, Mass.	400-99011	35,000

Project	Task	Vendor	Contract Number	Amount
Market Analysis:				
North American Pleasure Cruise Industry	To conduct a market analysis of the North American pleasure cruise business.	Centaur Associates Inc. Washington, D.C.	9-00037	$ 49,908
Short-Range Trade Forecast	Develop simple methods for predicting short-range liner trade flows by motor carrier route.	Jack G. Faucett Associates, Inc. Chevy Chase, Md.	9-00041	116,449
Market Economics	To study the effects of terms of sale (CIF/FOB) on the selection of an ocean carrier and develop market strategies to influence favorable terms of sale.	International Science & Technology Washington, D.C.	9-00076	132,959
	National Maritime Research Center			
Exploratory Research:				
Estimation of Hydrodynamic Coefficients From Hull Scale Test	To develop a specification and design for an instrument system with the ability to obtain state-of-the-art vessel dynamic data in order to provide the maritime industry basic technology, testing, instrumentation, software, and engineering to satisfy the basic needs in the ship dynamic performance area.	Systems Control Inc. Palo Alto, Calif.	MA5-0098	35,931
Ship Response Monitoring and Guidance *	To provide for the testing, evaluation, and modification of the Ship Response Monitoring and Guidance System for installation aboard the MSC ship USNS FURMAN.	Hoffman Maritime Consultants Glen Head, N.Y.	MA5-0093	52,086
	Provide engineering support for tests of the ship Response Monitoring System aboard the USNS FURMAN.	Maritime Engineering Services Great Neck, N.Y.	MA5-0086	24,084
Wave Height Measurement Phase I	To procure, install, and test a pulsed laser wave height profiting device for ship use.	Associated Controls and Communication Lynn, Mass.	MA5-0083	21,000
Diesel Impediments	To identify and assess problem areas of shipowners with diesel fuel which constitute impediments to the application of diesel engines in U.S.-flag merchant ships.	Webb Institute of Naval Architecture Glen Cove, N.Y.	MA5-0092	17,200

* Cost-shared.

Project	Task	Vendor	Contract Number	Amount
Computer-Aided Operations Research Facility:				
Uninterruptable Power Supply	To provide an emergency power supply to the Computer-Aided Operations Research Facility (CAORF) in the event of power loss and to avoid disruptions to scheduled tests, due to local electrical power problems.	A&L Systems Flushing, N.Y.	MA5-0105	$148,000
Lake Charles Test Subject Orientation	To provide theoretical and mathematical background on ship behavior characteristics of LNG vessels to prospective CAORF test subjects.	Webb Institute Naval Architecture Glen Cove, N.Y.	MA5-0101	10,800
Improved Situation Display Graphics	To incorporate improved Situation Display Graphic Generation programs and equipment in CAORF.	Sperry Systems Management Great Neck, N.Y.	MA5-0068	59,572
Hydrodynamic Coefficent Estimator	To develop containership simulation maneuvering characteristics for CAORF.	J.J. Henry, Co. Inc. New York, N.Y.	MA2-4339	15,200
CAORF Diagnostic Programs	To develop, design, test, document, and install diagnostic programs to provide CAORF with a capability of isolating faults efficiency through the use of programmed diagnostics under computer control.	Sperry Systems Management Great Neck, N.Y.	MA5-0102	195,836
Optimized Ship Routing	To incorporate the latest technology in sea-state forecasting, ship response prediction, route planning, ship-to-shore communications for optimizing weather fouling patterns and test new ships routing algorithms incorporating seakeeping and sea-state data.	Hoffmann Maritime Consultants Glen Head, N.Y.	MA5-0094	65,496

Appendix III: (Continued)

Project	Task	Vendor	Contract Number	Amount
Docking Simulation	To design, program, manufacture, integrate, and test simulated docking vessel display equipment and software to provide CAORF with this simulation capability.	Sperry Systems Management Great Neck, N.Y.	MA5-0097	$186,786
Pier & Dolphin Forces	To design, program and integrate computer programs to test pier, mooring line, anchor, and dolphin forces and thereby provide this simulation capability to the facility.	Sperry Systems Management Great Neck, N.Y.	MA5-0097	193,566
Marine Radar Interrogator Transponder	To manufacture, develop, and integrate a subsystem in the CAORF simulator to provide a radar target base. The subsystem would describe characteristics of traffic ships, fixed stations in certain geographical areas, and messages to be used in the simulator's demonstration.	Sperry Systems Management Great Neck, N.Y.	MA5-0105	183,505
Management and Operations	To provide for management and operation of CAORF from November 1, 1978, through June 30, 1979.	Grumman Data Systems Bethpage, N.Y.	5-38003	2,363,517
Management and Operations	To provide for management and operation of CAORF from July 1, 1979, through October 31, 1979.	Grumman Data Systems Bethpage, N.Y.	5-38003	995,327
Engineering and Support	To provide engineering, logistics, and technical support to maintain CAORF.	Sperry Systems Management Great Neck, N.Y.	8-3027	1,982,500
CAORF Spare Projector	To provide a spare projector for use in event of failure of one of the five online units. This would substitute in part for purchase of spare modules required for new Eidophor projectors.	Conrac Corp. West Caldwell, N.Y.	9-00010	264,466

LNG TAURUS returns to General Dynamics' Quincy, Mass., shipyard after successfully completing sea trials.

The following studies or reports were released by the Maritime Administration during fiscal year 1979.

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 '78 (The Annual Report of the Maritime Administration for Fiscal Year 1978), 115pp, $3.25 [GPO]

Index of Current Regulations of the Maritime Administration, Maritime Subsidy Board, National Shipping Authority (revised as of January 1, 1979), 43pp [MarAd]

Port Economic Impact Kit, prepared by Arthur D. Little, Inc., Pacific Coast Association of Port Authorities, September 1979, 133pp [MarAd]

Vessel Inventory Report as of June 30, 1979, October 1979, 60pp [MarAd]

U.S. Imports Via Minibridge, prepared by Office of Port and Intermodal Development, July 1979, 16pp [MarAd]

United States Oceanborne Foreign Trade Routes, Calendar Year 1977, 394pp, $5.50 [GPO]

Mid-America Ports Study, prepared by Tippetts-Abbett-McCarthy-Stratton, July 1979 [NTIS]

Executive Summary	20pp
PB-299561/AS	$ 4.00
Volume 1—Main Report	360pp
PB-293371/AS	$12.00
Volume 2—General Appendices	434pp
PB-299563/AS	$14.50

Development of a Standardized U.S.-Flag Dry Bulk Fleet, Phase I, prepared by M. Rosenblatt & Son, Inc., January 1979 [NTIS]

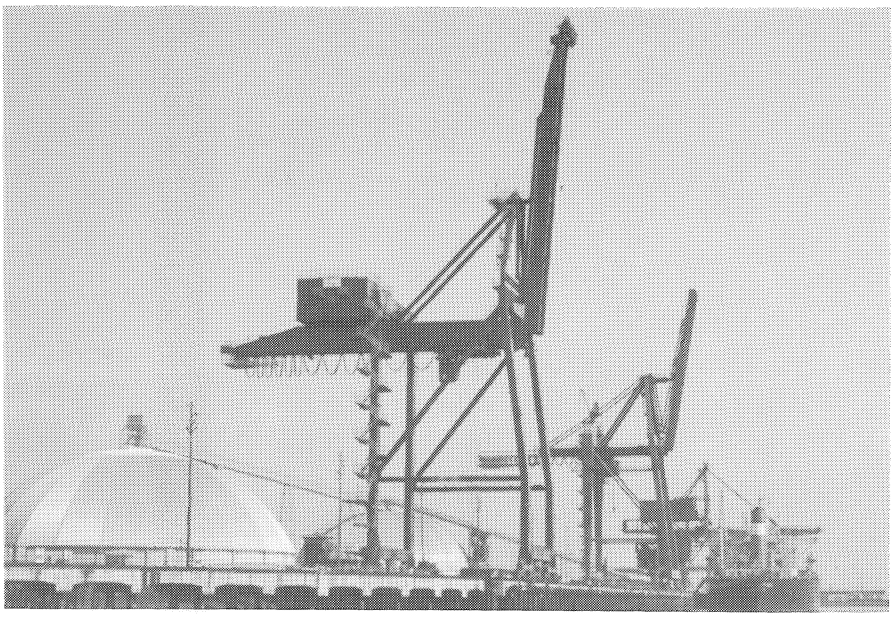
Executive Summary	14pp
PB-293368/AS	$ 4.00
Final Report	207pp
PB-293369/AS	$ 9.25
Appendix A—	
Commodities and Trade	485pp
PB-293370/AS	$15.00
Appendix B—	
Zone to Traffic Flows	57pp
PB-299562/AS	$11.75
Appendix C—	
Competitive Environment	289pp
PB-293372/AS	$11.00
Appendix D—	
Design Alternatives	182pp
PB-293373/AS	$ 9.00
Appendix E—	
Design Selections	148pp
PB-293374/AS	$ 7.25
Set	
PB-293367/AS	$50.00

Improving Productivity for Bulk Commodity Transfer Facilities in the Great Lakes Trade Area, prepared by Ernst & Ernst, April 1979 [NTIS]

Volume 1 Executive Summary	47pp
PB-296530/AS	$ 4.50
Volume 2 Report	416pp
PB-296531/AS	$13.25

Market Assessment for Transportation of Trade With Developing Nations, prepared by CACI, Inc., March 1979 [NTIS]

Volume I Executive Summary	25pp
PB-293096/AS	$ 4.50
Volume II Research Findings	174pp
PB-293097/AS	$ 8.00
Volume III Appendices	471pp
PB-293098/AS	$14.50
Set	
PB-293095/Set	$25.00



Two cranes are poised for action as third works ship in Port of Tacoma, Wash. Forty-ton container crane at left is new. Domes behind cranes hold imported alumina awaiting transshipment to Kaiser Aluminum plants in Tacoma and Spokane.

Acknowledgments

The Maritime Administration acknowledges with appreciation the courtesy of the following in supplying photographs for this report:

American Atlantic Shipping, Inc.

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Equitable Shipyards, Inc.

Farrell Lines, Inc.

Ford Motor Co.

Fraser Shipyards

General Dynamics, Quincy Shipbuilding Div.

Halter Marine, Inc.

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Ingalls Shipbuilding, Litton Industries, Inc.

Interlake Steamship Co.

IOT Corp.

Lykes Bros. Steamship Co., Inc.

Marine Const. and Design Co.

Maryland Port Administration, Port of Baltimore

Matson Navigation Co.

McDermott Shipyards

National Steel and Shipbuilding Co.

Newport News Shipbuilding and Dry Dock Co.

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M. Rosenblatt & Son

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