

MARAD '86



U.S. Department
of Transportation

**Maritime
Administration**

MARAD '86

The Annual Report of the
Maritime Administration
for Fiscal Year 1986

U.S. DEPARTMENT OF TRANSPORTATION
Maritime Administration

JUNE 1987

Table of Contents

Transmittal Letter		
Foreword	1	
Chapter 1—Shipbuilding	2	
Contract Awards	2	
Vessels on Order	2	
Ship Deliveries	2	
Title XI	2	
Capital Construction Fund	2	
Construction Reserve Fund	4	
Service Craft	4	
Shipyard Improvements	4	
Chapter 2—Ship Operations	7	
U.S. Fleet Profile	7	
Operating-Differential Subsidy	7	
Section 614 Activities	7	
Subsidy Rates	9	
Passenger/Cruise Service	10	
Section 804 Activities	10	
Corporate/Service Changes	11	
Foreign Transfers	11	
Chapter 3—Domestic Operations	19	
Great Lakes	19	
Inland Waterways	19	
Domestic Operations	21	
Domestic Ocean Trades	21	
Other Domestic Shipping Activities	21	
Charter Market Activity	21	
Offshore Drilling	21	
Chapter 4—Market Development	23	
Marketing Program	23	
Market Analysis and Planning	23	
Bilateral Cargo Monitoring	23	
Preference Cargoes	23	
Agencies Not in Full Compliance with Public Law 664	26	
Significant Developments in Cargo Preference	26	
Department of Defense	26	
Strategic Petroleum Reserve	26	
Eximbank	27	
Chapter 5—Port and Intermodal Development	28	
Annual Report on Ports	28	
Port and Waterway Development	28	
Technical and Research Assistance with Ports	28	
Port Planning Program	28	
Port Operations Program	30	
Technology Transfer	30	
Chapter 6—Research and Development	32	
Shipbuilding	32	
Ship's Machinery	32	
Fleet Management Technology	32	
Ship Performance and Safety	33	
Cargo Systems	33	
Military Sealift Research	33	
CAORF	34	
Advanced Systems and Technology	34	
Marine Science	34	
Arctic Shipping	35	
University Research	35	
Chapter 7—Maritime Labor and Training	36	
U.S. Merchant Marine Academy	36	
State Maritime Academies	37	
Supplemental Training	37	
Labor Relations	37	
Longshore	37	
Seafaring	38	
Labor Data	38	
Merchant Marine Awards	38	
Chapter 8—National Security	39	
Reserve Fleet	39	
Ready Reserve Force	39	
Ship Design and Engineering	39	
Exchanges for Scrap	42	
Ship Sales	42	
Donation for Museum Project	42	
Fish Reef Program	42	
War-Risk Insurance	42	
Marine Insurance	42	
Emergency Port Operations	43	
Emergency Operations	43	
Chapter 9—International Activities	44	
Maritime Discussions with Brazil	44	
Maritime Negotiations with the Soviet Union	44	
Maritime Consultations with China	44	
Maritime Discussions with Iceland	44	
Maritime Negotiations with Taiwan and Korea	44	
Consultative Shipping Group	44	
Other International Conferences	44	
Chapter 10—Administration	45	
Maritime Subsidy Board	45	
Legal Services, Legislation, and Litigation	45	
Management Initiatives	45	
Audits	45	

Information Management	46	4 Ship Financing Guarantees— Commitments Approved in FY 1986	5	15 Foreign Transfer Approvals— FY 1986	17
Personnel	46	5 Federal Ship Financing Guarantee (Title XI) Program Summary	5	16 U.S. Great Lakes Fleet— September 30, 1986	19
Safety Program	46	6 Capital Construction Fund Holders—September 30, 1986	6	17 Government-Sponsored Cargoes—Calendar Year 1985	24
Asbestos Control	46	7 Construction Reserve Fund Holders—September 30, 1986	6	18 Maritime Workforce Average Monthly Employment	38
Installations and Logistics	46	8 U.S. Oceangoing Merchant Marine—September 30, 1986	8	19 National Defense Reserve Fleet—September 30, 1986	40
Real Property	46	9 Employment of U.S.-Flag Oceangoing Fleet— September 30, 1986	9	20 National Defense Reserve Fleet—1945-1986	40
Accounting	46	10 Major Merchant Fleets of the World—July 1, 1986	10	21 Marine and War-Risk Insurance Approved in FY 1986	41
Maritime Administration		11 U.S. Oceanborne Foreign Trade/Commercial Cargo Carried	11	Appendices:	
Organization Chart	48	12 ODS Accruals and Outlays— January 1, 1937, to September 30, 1986	12	I Maritime Subsidy Outlays—1936-1986	54
Maritime Administration		13 Operating-Differential Subsidy Accruals and Outlays by Lines—January 1, 1937, to September 30, 1986	13	II Combined Condensed Financial Statements of Companies with Operating-Differential Subsidy Contracts	55
Field Organization Chart	49	14 ODS Contracts in Force— September 30, 1986	14	III Research and Development Contracts Awarded—FY 1986	57
Financial Statements				IV Studies and Reports Released in FY 1986	64
Exhibit 1 Statement of Financial Condition	50			Acknowledgments	
Exhibit 2 Statement of Operations	52				
Notes to Financial Statements	53				
Tables:					
1 Commercial Ship Construction Under Contract—September 30, 1986	3				
2 New Commercial Ships Delivered from U.S. Shipyards During FY 1986	3				
3 Worldwide Ship Deliveries— Calendar Year 1985	3				



Containership PRESIDENT GRANT, owned by American President Lines, Ltd., loads cargo at newly reconstructed terminal at the Port of Seattle.



THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

The President
The White House
Washington, D.C. 20500

The Honorable George Bush
President of the Senate
Washington, D.C. 20510

The Honorable James C. Wright, Jr.
Speaker of the House
of Representatives
Washington, D.C. 20515

Dear Sirs:

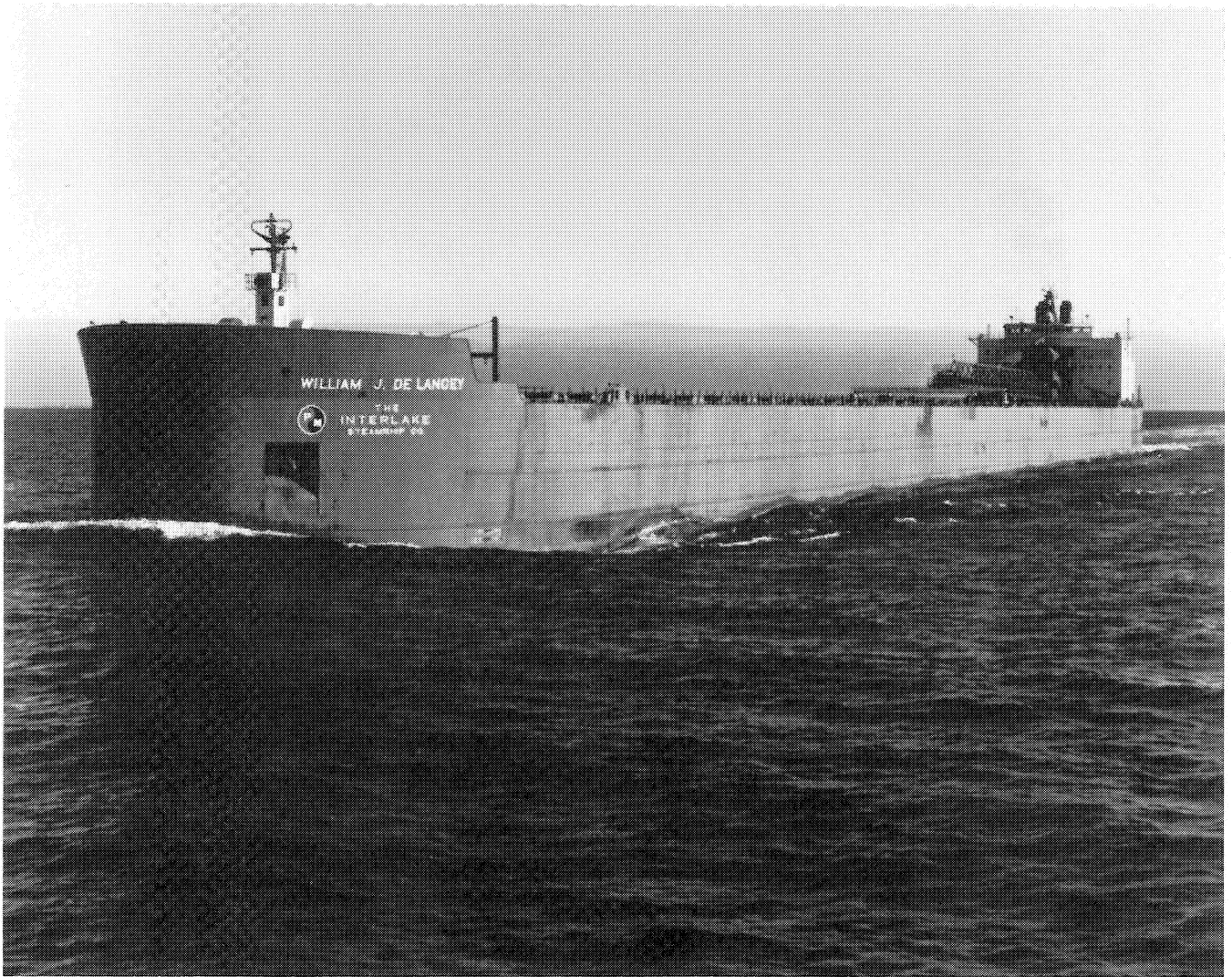
I have the pleasure of forwarding to you the annual report of the Maritime Administration for fiscal year 1986 as required by the Merchant Marine Act, 1936, as amended.

Sincerely,

A handwritten signature in black ink, reading 'Elizabeth H. Dole', is positioned above the typed name. The signature is fluid and cursive, with a large loop at the end of the last name.

Elizabeth Hanford Dole

Enclosure



With an overall length of 1,013.5 feet, the WILLIAM J. DE LANCEY is the largest vessel operating on the Great Lakes.

FOREWORD

The Annual Report of the Maritime Administration (MARAD) for the fiscal year ending September 30, 1986, is submitted in accordance with Section 298 of the Merchant Marine Act, 1936, as amended.

It incorporates reports required by the Congress on the following topics: acquisition of obsolete vessels in exchange for credit; war-risk insurance activities; scrapping or removal of obsolete vessels owned by the United States; and U.S.-flag carriage of Government-sponsored cargoes. No reportable activities occurred during FY 1986 concerning the allocation of construction- and operating-differential subsidy to port ranges and the settlement of claims arising under the Suits in Admiralty Act.

During FY 1986 four new commercial vessels aggregating 94,800 deadweight tons (dwt.) were delivered by American shipyards. At the close of the period, nine merchant vessels of 1,000 gross tons and over, totalling 499,980 dwt. and valued at \$522.9 million, were under construction or on order in American shipyards. However, work had been suspended on two of the vessels.

All new U.S. Navy construction contracts under the largest combatant ship program in peacetime history continued to be awarded to the Nation's commercial shipyards. During the 5 years ending September 30, 1986, the Navy committed \$58.8 billion to this program.

MARAD continued to experience a number of defaults under its Federal Ship Financing Guarantees (Title XI) Program. New applications were approved during the period to aid in financing the construction of six vessels in American shipyards.

At the end of the reporting period, the U.S.-flag privately owned, deep-draft merchant fleet (including the Great Lakes fleet) totaled 570 vessels with an aggregate carrying capacity of nearly 23 million dwt.

The report provides details on these topics and many other MARAD activities as well as on the state of the maritime industry.

JOHN A. GAUGHAN
Maritime Administrator

Chapter 1

Shipbuilding

In FY 1986, American shipyards delivered four commercial vessels aggregating 94,800 deadweight tons (dwt.).

Contract Awards

During this reporting period, private contracts were finalized for the construction of two dredges ordered the previous year, contingent upon Federal Ship Financing Guarantee Program approval. One dredge was ordered from Southern Shipbuilding Co. by Great Lakes Dredge and Dock Co. and the other from McDermott Shipyards by American Dredging Co.

The Maritime Administration (MARAD) has requested no construction-differential subsidy (CDS) funds since FY 1981 and no CDS contracts were awarded in FY 1986. However, the largest combatant ship program in the U.S. Navy's peacetime history was underway. Approximately \$58 billion has been appropriated to this program in the 5 years ending September 30, 1986. All Navy new construction contracts continue to be awarded to the Nation's commercial shipyards.

As of September 30, 1986, there were 60 naval vessels (excluding noncombatant T-Ships) of 1,000 light displacement tons (LDT) and over, under construction or on order in nine privately owned U.S. shipyards. Under the Navy's T-Ship program, 9 privately owned shipyards had 17 new T-Ships on order or under construction as well as 7 merchant ships being converted or under contract for major conversion. Eleven T-Ships were completed during FY 1986.

Vessels in the multibillion dollar T-Ship procurement program are mission oriented and include maritime repositioning ships, fast sealift ships, fleet oilers, auxiliary crane ships, and hospital ships. Some are Government-owned and operated by union or Military Sealift Command (MSC) civil service crews, and some are privately owned and chartered to the MSC with union crews.

Vessels on Order

On September 30, 1986, nine merchant vessels 1,000 gross tons and over, totaling 499,980 dwt. and valued at \$522.9 million, were under construction or on order in American shipyards. (See Table 1.) None will be built with CDS funds, but four are participating in the Title XI Program.

The builder of two of the vessels on order ceased construction after filing for protection under Chapter 11 of the U.S. Bankruptcy Code.

Ship Deliveries

Four new commercial vessels aggregating 94,800 dwt. were delivered by American shipyards in FY 1986. (See Table 2.) None of the vessels were built with CDS. The vessels delivered were:

- Three 30,000 dwt. product tankers, SAMUEL COBB, RICHARD G. MATTHIESEN, and LAWRENCE H. GIANELLA, built by Tampa Shipyards, Inc., a subsidiary of American Shipbuilding Co. The vessels are owned by Ocean Carriers, Inc., and will be chartered to the Military Sealift Command for use in point-to-point transportation; and
- The 4,800 dwt. self-propelled dredge QUACHITA, built by Twin City Shipyard, Inc., for Gulf Coast Trailing Co.

Table 3 shows merchant ship deliveries by major shipbuilding nations during calendar year 1985.

Title XI

Title XI of the Merchant Marine Act of 1936, as amended, established the Federal Ship Financing Guarantee Program. As originally enacted, Title XI authorized the Federal Government to insure private-sector loans or mortgages made to finance or refinance the construction or reconstruction of American-flag vessels.

Title XI was amended in 1972 to provide direct Government guarantees of the underlying debt obligations, with the Government holding a mortgage on the equipment financed. The U.S. Government in-

sure or guarantees full payment to the lender of the unpaid principal and interest on the mortgage or obligation in the event of default by the vessel owners.

Title XI guarantees of approximately \$47.6 million covering six vessels were approved in principle by MARAD during FY 1986. (See Table 4.) Based on previous Title XI commitments, MARAD issued security agreements covering a total of three vessels during this reporting period.

As of September 30, 1986, Title XI guarantees in force amounted to approximately \$5 billion. Active pending applications on that date represented approximately \$241.3 million in requests for additional guarantees. (See Table 5.)

During FY 1986, Congressional authority for the Title XI program had a cap of \$12 billion, with \$9.5 billion allocated to MARAD, \$1.65 billion reserved for use by the Department of Energy in ocean thermal-energy conversion vessels and facilities, and \$850 million authorized to guarantee the financing of fishing vessels by the National Oceanic and Atmospheric Administration.

The total costs of the MARAD portion of the program are underwritten by fees which are paid by users. The insurance premiums and guarantee fees go into the Federal Ship Financing Fund, a revolving fund which may be used for payment of any defaults and administrative expenses. During FY 1986, MARAD borrowed \$1.2 billion from the U.S. Treasury to pay off 92 contract defaults involving a total of 1,247 vessels. Nearly 900 of these vessels were barges and shipboard lighters.

During FY 1986, the Federal Ship Financing Fund operated at a deficit of \$755 million. The balance of the fund on September 30, 1986, was \$64,397,119.

Capital Construction Fund

The Capital Construction Fund (CCF) Program was established under the Merchant Marine Act of 1970. It assists operators in accumulating capital to build, acquire, and reconstruct vessels through the deferral of Federal income taxes on certain deposits, as defined in Section 607 of the Merchant Marine Act, 1936, as amended.

Table 1: COMMERCIAL SHIP CONSTRUCTION UNDER CONTRACT—SEPTEMBER 30, 1986

Owner	Shipbuilder	Ship Type ¹	No. of Ships	Total Deadweight Tons	Est. Completion Date	Est. Cost (Millions)	Government Participation ²
New Construction:							
Sea-Land Service, Inc.	Bay Shipbuilding	C	3	63,000	9/87	\$ 180.0	None
Exxon Shipping Co.	National Steel	COT	2	418,400	2/87	\$ 250.0	None
At-Sea Incineration	Tacoma Boatbuilding	I	2	12,400	³	\$ 74.6	MG
Atlantic Trailing Co.	McDermott Shipyard	D	1	5,280	4/87	\$ 14.0	MG
Great Lakes Dredge & Dock Co.	Southern Shipbuilding	D	1	900	12/86	\$ 4.3	MG
Total New Construction ⁴			9	499,980		\$522.9	

¹ C= Containership; COT= Crude Oil Tanker; I= Incinerator Ship; D= Self-Propelled Dredge.

² MG= Title XI mortgage guarantees.

³ Work suspended in September 1985 when builder filed petition for Chapter 11 of U.S. Bankruptcy Code.

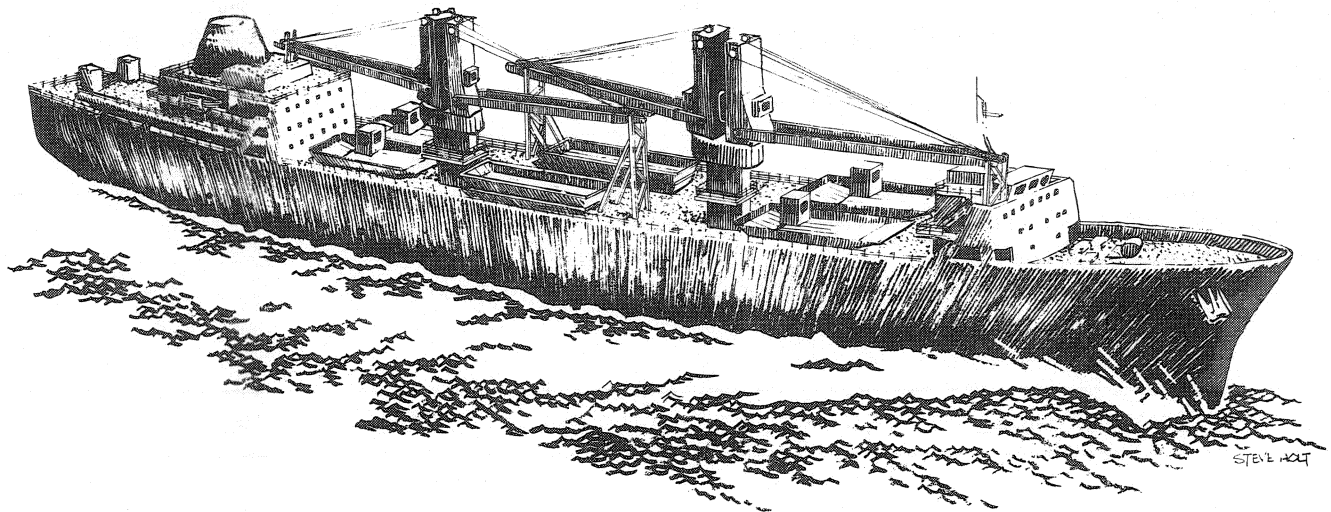
⁴ Merchant vessels 1,000 gt. and over.

Table 2: NEW COMMERCIAL SHIPS DELIVERED FROM U.S. SHIPYARDS DURING FY 1986

Owner	Builder	Vessel Type	Vessels
Ocean Carriers, Inc.	Tampa Shipyards	Product Tanker	3
Gulf Coast Trailing Co.	Twin City Shipyard	Self-Propelled Dredge	1
Total Deliveries			4

Table 3: WORLDWIDE SHIP DELIVERIES—CALENDAR YEAR 1985 (TONNAGE IN THOUSANDS)

Country of Construction	Total All Types		Combination Pass. & Cargo		Freighters		Bulk Carriers		Tankers Deadweight Tons	
	No.	Deadweight Tons	No.	Deadweight Tons	No.	Deadweight Tons	No.	Deadweight Tons	No.	Tons
Total	790	20,631.7	6	22.6	340	3,869.1	293	12,441.1	151	4,298.9
United States	8	188.7	—	—	3	75.5	1	21.5	4	91.7
Brazil	12	684.5	—	—	—	—	9	413.6	3	270.9
China (Mainland)	13	165.9	—	—	9	74.7	4	91.2	—	—
China (Taiwan)	6	245.6	—	—	4	170.8	2	74.8	—	—
Denmark	20	465.4	1	7.1	12	103.3	3	133.3	—	—
Finland	7	79.3	1	0.4	3	48.4	1	4.6	2	25.9
German Dem. Republic	10	131.6	—	—	10	131.6	—	—	—	—
Germany (Fed. Republic)	76	627.4	1	3.4	70	545.0	1	25.6	4	53.4
Japan	423	11,996.5	—	—	140	1,438.1	200	8,484.7	83	2,073.7
Korea (Republic of)	72	2,936.7	—	—	21	612.0	40	1,878.0	11	446.7
Netherlands	19	111.5	—	—	15	66.6	—	—	4	44.9
Poland	13	383.0	—	—	5	56.4	5	169.6	3	157.0
Spain	20	712.5	—	—	7	56.6	8	438.2	5	217.7
Sweden	5	214.9	—	—	2	55.1	—	—	3	159.8
U.S.S.R.	1	29.5	—	—	—	—	—	—	1	29.5
United Kingdom	10	223.6	—	—	6	75.3	4	148.3	—	—
Yugoslavia	11	133.5	2	8.0	2	12.8	—	—	7	112.7
All Others	64	1,301.6	1	3.7	31	346.9	15	557.7	21	615.0



During fiscal year 1986, the Maritime Administration awarded a contract to Norfolk Shipbuilding & Drydock Corp. for the conversion of three National Defense Reserve Fleet containerships into U.S. Navy Auxiliary Crane Ships. Vessels, shown in artist's rendering, will offload containerships lacking cargo-handling gear while moored alongside.

The CCF program enables operators to build vessels for the U.S. foreign, Great Lakes, noncontiguous domestic trade (e.g., between the West Coast and Hawaii), and the fisheries of the United States. It aids in the construction, reconstruction, or acquisition of a wide variety of vessels, including containerships, tankers, bulk carriers, tugs, barges, supply vessels, ferries, and passenger vessels.

During calendar year 1985, \$65 million was deposited in these accounts. Since the program was initiated in 1971, fund holders have deposited \$4.4 billion in CCF accounts and withdrawn \$3.5 billion for the modernization and expansion of the U.S. merchant marine.

The value of projects completed or begun by CCF holders since the start of the program totals approximately \$5.9 billion. As of September 30, 1986, the 101 fund holders (shown in Table 6) had projected expenditures under this program totaling \$4.8 billion. Of this total, \$2.4 billion is projected for vessels operating in the U.S. foreign trade, \$2.3 billion for noncontiguous domestic trade, and \$90 million for the Great Lakes trade.

Construction Reserve Fund

Like the Capital Construction Fund, the Construction Reserve Fund (CRF) encourages upgrading of the domestic American-flag fleet. This program allows eligible parties to defer taxation of capital gains on the sale or other disposition of a vessel if net proceeds are placed in a CRF and reinvested in a new vessel within 3 years.

The CRF is used predominantly by owners of vessels operated in coastwise trades, the inland waterways, and other trades not eligible for the CCF Program, but its benefits are not as broad as those of the CCF. The number of companies with CRF balances increased to nine during FY 1986. (See Table 7.) Total deposits decreased from \$5.8 million to \$4.9 million.

Service Craft

During FY 1986 MARAD continued construction of 12 Reserve Fleet

Service Craft which will be used as utility workboats at the three National Defense Reserve Fleet anchorages. Eight craft were delivered in FY 1986; the other four were scheduled to be delivered in FY 1987. Construction is being performed at Quality Shipbuilders, Inc., of Moss Point, MS.

Shipyard Improvements

During FY 1986, the American shipbuilding and ship repair industry invested over \$225 million in upgrading and expanding facilities. Plans were underway to invest at least \$50 million in FY 1987, mainly to improve efficiency and competitiveness for future participation in the Navy's construction, repair, and overhaul projects.

Since enactment of the Merchant Marine Act of 1970, the U.S. shipbuilding and ship repair industry has invested approximately \$3.9 billion in facility improvements.

Table 4: SHIP FINANCING GUARANTEES—COMMITMENTS APPROVED IN FY 1986

Number	Type	Company	Amount Guaranteed
Ocean:			
1	American Dredge	American Trailing Co.	\$ 12,589,000
1	Mobile Mooring Facility		
1	Passenger Cruise Vessel	Liberty Cruise Line, Inc.	\$ 8,962,000
1	Clamshell/Dipper Dredge	Great Lakes Dredge & Dock Co.	\$ 26,010,000
2	Dump Barges		
6		Total Vessels	\$ 47,561,000

**Table 5: FEDERAL SHIP FINANCING GUARANTEE (TITLE XI) PROGRAM SUMMARY
(Statutory Limit \$9.5 Billion) Principal Liability on September 30, 1986**

Vessel Types	Contracts in Force		Pending Applications	
	Vessels Covered	Principal Amount	Vessels Covered	Principal Amount
Deepdraft Vessels:				
Tankers	74	\$1,602,687,020	—	\$ —
Cargo	94	791,935,616	—	—
LNGs	10	772,147,000	—	—
Bulk/OBOs	22	339,917,691	—	—
Total	200	\$3,506,687,327	—	\$ —
Other Types:				
Drill Rigs/Ships	38	\$ 306,160,040	—	\$ —
Tugs/Barges/Drill Service	2,868	1,021,230,275	2	4,125,000
Miscellaneous	21	165,989,890	11	237,155,000
Total	2,927	\$1,493,380,205	13	\$ 241,280,000
Total Vessels	3,127	\$5,000,067,532	13	\$ 241,280,000
Shipboard Lighters	1,386	\$ 30,256,022	—	\$ —
Total	4,513	\$5,030,323,554	13	\$ 241,280,000

Table 6: CAPITAL CONSTRUCTION FUND HOLDERS—SEPTEMBER 30, 1986

Alaska Riverways, Inc.	Falcon Capital, Inc.	Moore McCormack Resources, Inc.
Amak Towing Co., Inc.	Falcon Funding, Inc.	Neuman Boat Line, Inc.
AMC Boats, Inc.	Falcon World Shipping, Inc.	Nicor, Inc.
American President Lines, Inc.	Farrell Lines, Inc.	O.L. Schmidt Barge Lines, Inc.
American Shipping, Inc.	Foss Launch and Tug Co.	Oceanic Research Services, Inc.
Andover Co., L.P.	Fred Devine Diving & Salvage, Inc.	Ocean Carriers, Inc.
Aquarius Marine Co.	G & B Marine Transportation, Inc.	Öffshore Marine, Inc.
Ashland Oil, Inc.	GATX Corp.	Oglebay Norton Co.
Atlantic Richfield Co.	General Electric Credit and Leasing Corp.	OMI Corp.
Atlas Marine Co.	General Electric Credit Corp. of Delaware	Overseas Bulktank Corp.
Bankers Trust of New York Corp.	General Electric Credit Corp. of Georgia	Pacific Hawaiian Lines, Inc.
Bethlehem Steel Corp.	Gilco Supply Boats, Inc.	Pacific Shipping, Inc.
Binkley Co., The	Graham Boats, Inc.	Petro-Boats, Inc.
Blue Lines, Inc.	Great Lakes Towing Co.	Prudential Lines, Inc.
Brice Inc.	Hannah Brothers	Ritchie Transportation Co.
Cambridge Tankers, Inc.	Hannah Marine Corp.	Rouge Steel Co.
Campbell Towing Co.	Hvide Shipping, Inc.	Seabulk Tankers, Ltd.
Canonie Offshore, Inc.	Inland Steel Co.	Sea-Land Corp.
Canonie Transportation, Inc.	Inter-Cities Navigation Corp.	Sea Savage, Inc.
Cement Transit Co./Medusa Corp.	Intercontinental Bulktank Corp.	Sheplers, Inc.
Central Gulf Lines, Inc.	Interstate Marine Transport Co.	Smith Lighterage Co., Inc.
Citimarlease (Burmah I), Inc.	Interstate Towing Co.	State Boat Corp.
Citimarlease (Burmah LNG Carrier), Inc.	John E. Graham & Sons	Steel Style Marine
Citimarlease (Burmah Liquegas), Inc.	Kinsman Lines, Inc.	Sun Co., Inc.
Citimarlease (Fulton), Inc.	L & L Marine Service, Inc.	Tidewater Inc.
Citimarlease (Whitney), Inc.	Leppaluoto Offshore Marine, Inc.	Totem Resources Corp.
Crowley Maritime Corp.	Lykes Bros. Steamship Co.	Union Oil Co. of California
CSI Hydrostatic Testers, Inc.	Madeline Island Ferry Lines, Inc.	United States Cruises, Inc.
Dillingham Tug & Barge Corp.	Matson Navigation Co., Inc.	United States Lines, Inc.
Edison Chouest Offshore, Inc.	Middle Rock, Inc.	United States Lines (S.A.), Inc.
Edward E. Gillen Co.	Miller Boat Line, Inc.	Waterman Steamship Corp.
Eserman Offshore Service, Inc.	Moody Offshore, Inc.	Western Pioneer, Inc.
Exxon Shipping Co.		Windjammer Cruises, Inc.
Falcon Alpha Shipping, Inc.		Young Brothers, Ltd.
		Zidell, Inc.

Table 7: CONSTRUCTION RESERVE FUND HOLDERS—SEPTEMBER 30, 1986

Arrow Tankers, Inc.	Joan Turecamo, Inc.	Kurz Marine, Inc.
Cargo Carriers, Inc.	Ingram Industries, Inc.	Mobil Oil Corp.
Central Gulf Lines	Keystone Shipping Co.	Serodino, Inc.

Chapter 2

Ship Operations

U.S. Fleet Profile

On September 30, 1986, the U.S.-flag privately owned, deep-draft merchant fleet (including the Great Lakes fleet listed in Table 16) totaled 570 vessels with an aggregate carrying capacity of about 23 million deadweight tons (dwt.).

The oceangoing segment of the privately owned fleet consisted of 465 vessels of 20.7 million dwt., of which 381 ships of 16.5 million dwt. were active. The latter comprised 36 breakbulk cargo ships, 134 intermodal vessels (containerships, barge-carrying vessels, and roll-on/roll-off vanships known as RO/ROs), 2 combination passenger-cargo ships, 188 tankers (including liquefied natural gas carriers), and 21 bulk carriers. (See Table 8.)

Of the 84 inactive vessels, 6 were temporarily inactive, either awaiting cargoes or undergoing repairs, and 78 were laid up.

Employment of the U.S.-flag oceangoing fleet (including Government-owned ships) at the end of the fiscal year is shown in Table 9.

As of July 1, 1986, the privately owned American-flag fleet ranked 6th in the world on a deadweight-ton basis and 13th on the basis of number of ships. (See Table 10.)

Commercial cargoes carried by ships of all flags in the U.S. oceanborne foreign trade totaled 640.9 million tons in calendar year 1985. U.S.-flag tonnage decreased from 29.4 million to 27.3 million tons, and the U.S.-flag share of total tonnage remained at the 4.3 percent level of the previous year.

Commercial cargoes transported in U.S. oceanborne trade from 1976 through calendar year 1985 are shown in Table 11. The table shows the total trade by tonnage and value, and the portion carried by U.S.-flag vessels.

Operating-Differential Subsidy

U.S. flag vessels which operate in essential foreign trades are eligible for operating-differential subsidy (ODS) which is administered by MARAD. ODS is designed to offset certain lower ship-operating cost advantages of foreign-flag competitors. Net subsidy outlays during FY 1986 amounted to \$287.8 million.

Subsidy of approximately \$5.1 million was paid to one liner company for voyages in the Great Lakes trade in fiscal year 1986.

ODS accruals and expenditures from January 1, 1937, through September 30, 1986, are summarized in Table 12. Accruals and outlays by shipping lines for the same period are shown in Table 13.

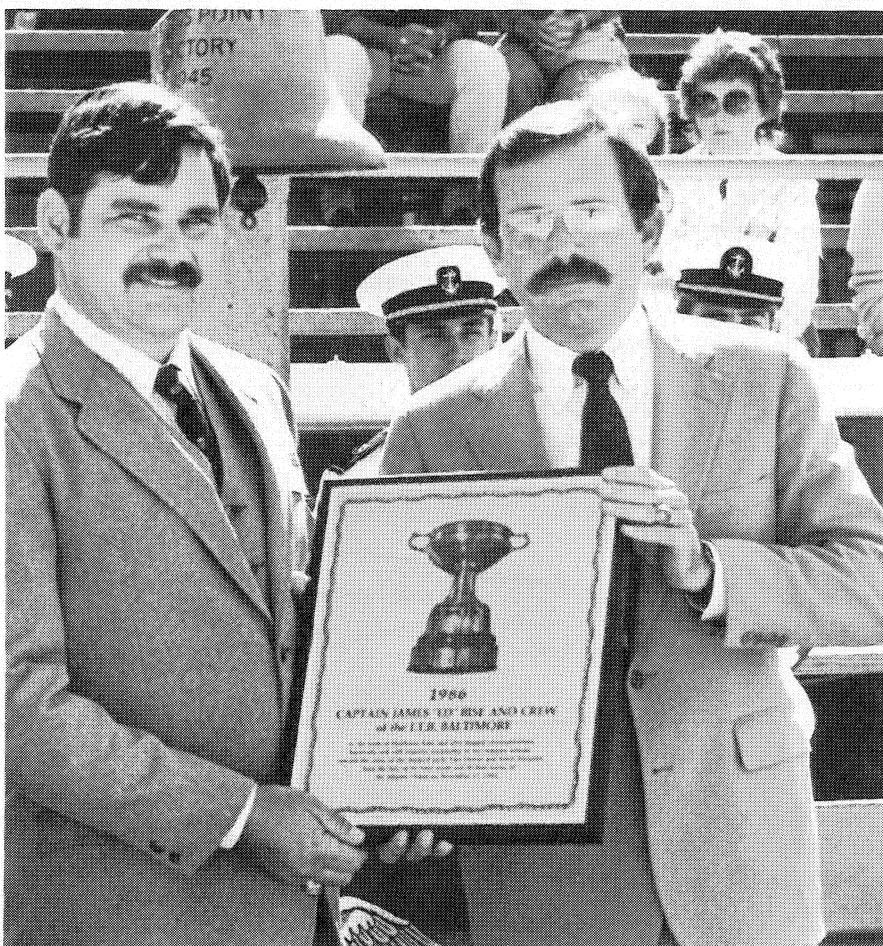
During FY 1986, 21 operators (7 liner and 14 bulk) held 25 ODS contracts with MARAD and operated 109 subsidized vessels. (See Table 14.)

On that same date, the nonsubsidized oceangoing fleet comprised 355 vessels and 175 companies.

Total operating and construction subsidy outlays since the program's inception are shown in Appendix I.

Section 614 Activities

Section 614 of the Merchant Marine Act, 1936, as amended, permits a company receiving ODS funds to suspend its ODS agreement for all or a portion of its vessels, subject to certain conditions. Suspension of the ODS agreement includes suspending all attendant statutory and contrac-



Maritime Administrator John Gaughan, right, presents the 1986 American Merchant Marine Seamanship Award to Capt. J. Edward Bise of the integrated tug-barge ITB BALTIMORE. The award honored Capt. Bise and his crew for the 1985 rescue of survivors of two yachts which foundered in the Caribbean during Hurricane Kate.

tual restrictions in the ODS agreement, except those pertaining to operation in the domestic trade.

During FY 1986 six companies operated under suspended ODS agreements:

- Equity Carriers, I, Inc., suspended its ODS contract on the PRIDE OF TEXAS effective September 21, 1981.
- Asco-Falcon II Shipping Co. suspended its ODS agreement on the STAR OF TEXAS effective December 4, 1981.
- Aries Marine Shipping Co. suspended its ODS agreement

on the ULTRAMAR effective April 10, 1982, and on the ULTRASEA effective December 10, 1982. (On February 10, 1986, American Maritime Transport, Inc. assumed the operating-differential subsidy rights of these two vessels.)

- Equity Carriers III, Inc., suspended its ODS contract on the SPIRIT OF TEXAS effective December 29, 1982.
- Aeron Marine Shipping Co. suspended its ODS contract on the GOLDEN ENDEAVOR effective

November 20, 1984. (On February 10, 1986, American Maritime Transport, Inc. assumed the operating-differential subsidy rights of this vessel.)

- United States Lines, Inc. suspended its ODS contract on the AMERICAN PIONEER effective June 6, 1986, and on the AMERICAN PURITAN effective June 27, 1986.

On April 15, 1986, three vessels were reinstated, PRIDE OF TEXAS, STAR OF TEXAS and SPIRIT OF TEXAS.

Table 8: U.S. OCEANGOING MERCHANT MARINE—OCTOBER 1, 1986¹

Vessel Type	Privately Owned		MARAD Owned ²		Total	
	Number Ships	Deadweight Tons (000)	Number Ships	Deadweight Tons (000)	Number Ships	Deadweight Tons (000)
Active Fleet:						
Passenger/Passenger-Cargo	2	15	4	32	6	47
General Cargo	36	534	4	28	40	562
Intermodal	134	3,624	—	—	134	3,624
Bulk Carriers (Incl. TB)	21	870	—	—	21	870
Tankers (Incl. TKB & LNG)	188	11,430	2	21	190	11,451
Total Active Fleet	381	16,473	10²	81	391	16,554
Inactive Fleet:						
Passenger/Passenger-Cargo	6	59	26	199	32	258
General Cargo	14	179	186	2,135	200	2,314
Intermodal	20	355	26	676	46	1,031
Bulk Carriers (Incl. TB)	5	400	—	—	5	400
Tankers (Incl. TKB & LNG)	39	3,252	25	690	64	3,942
Total Inactive Fleet	84	4,245	263	3,700	347	7,945
Total Active and Inactive:						
Passenger/Passenger-Cargo	8	74	30	231	38	305
General Cargo	50	713	190	2,163	240	2,876
Intermodal	154	3,979	26	676	180	4,655
Bulk Carriers (Incl. TB)	26	1,270	—	—	26	1,270
Tankers (Incl. TKB & LNG)	227	14,682	27	711	254	15,393
Total American Flag	465	20,718	273	3,781	738	24,499

¹ Vessels of 1,000 gross tons and over, excluding privately owned tugs, barges, etc.

² Includes 250 National Defense Reserve Fleet vessels of which 77 belong to the RRF.

NOTE: Tonnage figures may not add due to rounding.

Subsidy Rates

The Subsidy Index System, which provides for payment of seafaring wage subsidies in per diem amounts, was established by the Merchant Marine Act of 1970. The rate of change in the index is computed annually by the Bureau of Labor

Statistics and is used as the measure of change in seafaring employment costs.

In addition to the wage category, ODS rates are calculated for subsistence (for passenger vessels only), maintenance and repairs, hull and machinery insurance, and protection

and indemnity insurance for both premiums and deductibles.

MARAD is modifying its procedures for determining ODS so that final subsidy payments can be maintained on a current basis. Regulations governing procedures for liner vessels were expected to become ef-

Table 9: EMPLOYMENT OF U.S.-FLAG OCEANGOING MERCHANT FLEET—SEPTEMBER 30, 1986¹

Status and Area of Employment	Vessel Type (tonnage in thousands)											
	Total		Passenger/ Pass. & Cargo		General Cargo		Intermodal		Bulk Carriers ²		Tankers ³	
	No.	Deadweight Tons	No.	Deadweight Tons	No.	Deadweight Tons	No.	Deadweight Tons	No.	Deadweight Tons	No.	Deadweight Tons
Grand Total	738	24,499	38	305	240	2,876	180	4,655	26	1,270	254	15,393
Active Vessels	391	16,554	6	47	40	562	134	3,624	21	870	190	11,451
Privately Owned	381	16,473	2	15	36	534	134	3,624	21	870	188	11,430
U.S. Foreign Trade	144	4,832	—	—	27	401	83	2,507	9	488	25	1,436
Foreign-to-Foreign	12	643	—	—	—	—	4	72	—	—	8	571
Domestic Trade	168	9,474	2	15	—	—	25	440	10	320	131	8,699
Coastal	96	3,857	—	—	—	—	2	47	6	179	88	3,631
Noncontiguous	72	5,617	2	15	—	—	23	393	4	141	43	5,068
M.S.C. Charter	57	1,524	—	—	9	133	22	605	2	62	24	724
Government Owned	10	81	4	32	4	28	—	—	—	—	2	21
B. B. Charter & Other Custody	10	81	4	32	4	28	—	—	—	—	2	21
Inactive Vessels	347	7,945	32	258	200	2,314	46	1,031	5	400	64	3,942
Privately Owned	84	4,254	6	59	14	179	20	355	5	400	39	3,252
Temporarily Inactive	6	259	—	—	—	—	1	38	1	63	4	158
Laid-Up	77	3,983	6	59	14	179	18	314	4	337	35	3,094
Laid-Up (MARAD Custody)	1	3	—	—	—	—	1	3	—	—	—	—
Government Owned (MARAD Custody)	263	3,700	26	199	186	2,135	26	676	—	—	25	690
National Defense Reserve Fleet	250	3,267	22	173	186	2,135	20	491	—	—	22	468
Ready Reserve Force (RRF)	77	1,167	1	9	53	661	15	356	—	—	8	141
Other Reserve	145	1,832	7	64	124	1,389	5	135	—	—	9	244
Special Programs ⁴	4	33	1	5	3	28	—	—	—	—	—	—
Non-Retention ⁵	24	235	13	95	6	57	—	—	—	—	5	83
In Processing for RRF	5	169	—	—	—	—	5	169	—	—	—	—
Other Government Owned	8	264	4	26	—	—	1	16	—	—	3	222

¹ Excludes vessels operating exclusively on the Great Lakes, inland waterways, and those owned by the United States Army and Navy, and special types such as cable ships, tugs, etc.

² Includes Tug Barges

³ Includes Tanker Barges and LNG vessels

⁴ Vessels unavailable for activation due to special status

⁵ Vessels not actively maintained.

fective early in FY 1987. Similar procedures applicable to bulk vessels were still being considered at close of FY 1986. For liner operators, MARAD has completed, on an ad hoc basis, 1986 single per diem subsidy rates for all items of expense. For bulk operators, MARAD has substantially completed 1986 subsidy rates for wages and 1983 subsidy rates for all other eligible expenses.

Passenger/Cruise Service

As of September 30, 1986, U.S.-flag oceangoing passenger service was provided by the cruise liners INDEPENDENCE and CONSTITUTION. These vessels are operated by American Hawaii Cruises, Inc. in the Hawaiian inter-island trade.

On the inland waterways, two traditionally styled steamboats operated by Delta Queen Steamboat Co. provided a variety of cruises on the Mississippi and Ohio Rivers. Additionally, the Padelford Packet Boat

Co. and American Cruise Lines offered cruises on the Upper Mississippi River and along the Gulf Coast.

Five operators provided local coastwise service with vessels carrying 100 or fewer passengers. American Canadian Line served the New England Coast, Great Lakes, Saguenay River of Canada, and the Caribbean; American Cruise Lines served the Atlantic Coast; Clipper Cruise Line and Coastal Cruise Line served the Atlantic Coast and the Caribbean; and Exploration Cruise Lines operated on the U.S. and Canadian Pacific Coasts, including Alaska.

Under its Title XI program, MARAD received applications during FY 1986 to aid in financing the construction of two 800-passenger oceangoing cruise ships and six 100+ passenger coastwise cruise vessels.

One application for a 140-passenger cruise vessel was approved, but no cruise vessels were added to the fleet during the year.

In December 1985, the U.S. Customs Service issued Treasury

Decision 85-109 which eliminated the 24-hour rule governing foreign cruise ship visits in U.S. ports. It also allows foreign cruise ships to visit consecutive U.S. ports as long as an appropriate number of nearby foreign ports are also in their itineraries.

Section 804 Activities

Section 804 of the Merchant Marine Act, 1936, as amended, prohibits 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 U.S.-flag service, without prior approval of the Secretary of Transportation. The prohibition also applies to any officers, directors, agents, or executives of such an organization.

On May 22, 1986, MARAD waived the provisions of section 804 to allow American President Lines, Ltd. (APL) to charter and operate for a period

Table 10: MAJOR MERCHANT FLEETS OF THE WORLD—JULY 1, 1986

Country	No. of Ships ¹	Rank by No. of Ships	Deadweight Tons	Rank by Deadweight Tonnage
Liberia	1,783	3	113,856,000	1
Panama	3,611	1	70,379,000	2
Japan	1,572	5	59,394,000	3
Greece	1,756	4	57,524,000	4
U.S.S.R.	2,531	2	25,151,000	5
United States (Privately Owned)	468	13	20,790,000	6
United Kingdom	527	9	19,557,000	7
Norway	387	17	17,116,000	8
British Colonies	468	14	16,814,000	9
Cyprus	747	7	16,463,000	10
China (mainland)	1,048	6	15,989,000	11
Italy	573	8	12,557,000	12
France	260	24	11,887,000	13
Korea (Republic of)	487	10	11,150,000	14
Singapore	472	12	11,052,000	15
All Others ²	8,734		136,726,000	
Total	25,424		616,667,000	

¹ Oceangoing merchant ships of 1,000 gross tons and over.

² Includes 269 United States Government-Owned Ships of 3,597,000 dwt.

of 2 years four foreign-flag vessels for feeder service between APL's Line A or Line B ports. Two vessels are permitted to serve Singapore and Thailand, and two may serve China.

Corporate/Service Changes

In May 1986, Prudential Lines, Inc., ceased its regular liner service on Trade Route 10 (U.S. North Atlantic-Mediterranean).

Foreign Transfers

In FY 1986, MARAD approved the transfer of 69 ships of 1,000 gross tons and over to foreign firms. Thirty-

one of these vessels were sold for scrapping abroad.

Permission was granted for the foreign transfer of 322 vessels of less than 1,000 gross tons during the fiscal year. These included 218 commercial and 104 pleasure craft.

During the year MARAD approved three contracts of affreightments and modified one. Thirty-four U.S.-owned ships of over 1,000 gross tons were approved for charter to aliens, and 20 charter approvals involving 569 vessels were modified.

Pursuant to Public Law 89-346 and 46 CFR 221.21-221.30, the Agency approved the retention of 38 banks on the roster of Approved Trustees. Four new banks were approved as trustees.

During FY 1986 46 CFR 221 was revised so as to grant the approval required by Sections 9 and 41 of the Shipping Act, 1916, as amended, of: (1) the bareboat charter of U.S.-documented recreational vessels to noncitizens of the United States for recreational use for periods of less than six (6) months; and (2) the sale of U.S.-flag vessels of less than 200 gross tons to aliens, and the transfer of such vessels to foreign registry and flag. These blanket approvals eliminate the requirement for additional action by MARAD.

During the fiscal year there were 59 foreign sale violations reported, of which 49 were mitigated or settled.

User charges for filing applications for foreign transfers and similar ac-

Table 11: U.S. OCEANBORNE FOREIGN TRADE/COMMERCIAL CARGO CARRIED ¹
Tonnage (Millions)

Calendar Year	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Total Tons	698.8	775.3	775.6	823.1	772.2	760.0	675.5	630.4	676.8	640.9
U.S.-Flag Tons	33.8	34.8	32.1	35.0	28.2	34.2	31.1	36.7	29.4	27.3
U.S. Percent of Total	4.8	4.5	4.1	4.2	3.7	4.5	4.6	5.8	4.3	4.3
Liner Total Tons	49.8	47.8	56.5	57.0	59.3	60.0	54.5	56.8	63.5	66.7
Liner U.S.-Flag Tons	15.4	14.4	16.0	15.7	16.2	16.5	14.3	14.0	13.8	14.0
Liner U.S. Percent	30.9	30.2	28.3	27.5	27.3	27.6	26.2	24.6	21.7	21.0
Non-Liner Total Tons	289.6	289.0	308.8	342.7	356.7	365.6	335.8	317.7	346.3	327.5
Non-Liner U.S.-Flag Tons	4.9	4.9	4.5	3.6	4.1	4.5	3.3	4.8	5.1	5.1
Non-Liner U.S. Percent	1.7	1.7	1.5	1.0	1.2	1.2	1.0	1.5	1.5	1.5
Tanker Total Tons	359.4	359.4	410.3	423.4	356.3	334.4	285.6	256.0	266.9	246.7
Tanker U.S.-Flag Tons	13.6	13.6	11.6	15.7	7.9	13.2	13.2	17.9	10.5	8.2
Tanker U.S. Percent	3.8	3.8	2.8	3.7	2.2	3.9	4.7	7.0	3.9	3.3
Value (\$ Billions)										
Total Value	148.4	171.2	195.8	242.1	294.3	315.4	281.2	267.4	302.7	311.0
U.S.-Flag Value	26.4	28.0	30.7	35.7	42.3	47.0	43.5	43.0	44.6	46.4
U.S. Percent of Total	17.8	16.4	15.7	14.7	14.4	14.9	15.5	16.1	14.7	14.9
Liner Total Value	75.8	82.3	99.9	117.6	136.9	148.0	140.6	139.6	164.0	181.2
Liner U.S.-Flag Value	23.9	24.2	28.6	32.5	39.2	41.7	39.1	37.9	41.2	43.4
Liner U.S. Percent	31.6	30.7	28.6	27.6	28.7	28.1	27.8	27.2	25.1	24.0
Non-Liner Total Value	38.2	42.7	52.5	62.0	74.1	81.0	72.0	69.8	78.6	77.2
Non-Liner U.S.-Flag Value	1.1	1.2	1.0	1.1	1.3	1.9	1.2	1.2	1.1	1.4
Non-Liner U.S. Percent	2.8	2.8	1.8	1.7	1.8	2.3	1.7	1.7	1.5	1.8
Tanker Total Value	34.4	46.3	43.4	62.6	83.6	86.4	68.5	58.0	60.1	52.6
Tanker U.S.-Flag Value	1.4	1.6	1.1	2.1	1.8	3.4	3.2	4.0	2.2	1.6
Tanker U.S. Percent	4.2	3.5	2.7	63.4	2.1	3.9	4.7	6.8	3.7	3.1

¹ Table includes Government-sponsored cargo; excludes U.S./Canada translates cargoes and certain Department of Defense cargoes.

tions totaled \$126,645 in the reporting period, including \$5,180 in fees filed pursuant to outstanding MARAD contracts reflecting prior foreign transfers.

MARAD's approval of the transfer of vessels of 3,000 gross tons and

over to foreign ownership or registry, or both (whether for operation or scrapping) are subject to the terms and conditions of the Agency's current Foreign Transfer Policy (46 CFR Part 221 Appendix). There are presently 66 vessels subject to these

terms and conditions, which accompany titles to the ship and remain in effect for the period of their remaining economic lives.

Activities under Section 9 of the Shipping Act, 1916, are summarized in Table 15.

Table 12: ODS ACCRUALS AND OUTLAYS—JANUARY 1, 1937, TO SEPTEMBER 30, 1986

Calendar Year of Operation	Accruals			Outlays		
	Subsidies	Recapture	Subsidy Accrual	Paid In FY 1986	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	179,396,797	4,929,404	174,467,393	–0–	174,467,393	–0–
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	230,256,091	2,217,144	228,038,947	–0–	228,038,947	–0–
1970	232,541,169	(1,908,643)	234,449,812	–0–	234,449,812	–0–
1971	202,440,101	(2,821,259)	205,261,360	–0–	205,261,360	–0–
1972	190,732,158	–0–	190,732,158	–0–	190,732,158	–0–
1973	219,475,963	–0–	219,475,963	–0–	219,475,963	–0–
1974	219,297,428	–0–	219,297,428	–0–	219,297,428	–0–
1975	260,676,152	–0–	260,676,152	–0–	260,676,152	–0–
1976	275,267,465	–0–	275,267,465	–0–	275,267,465	–0–
1977	294,779,691	–0–	294,779,691	–0–	294,779,691	–0–
1978	285,075,424	–0–	285,075,424	–0–	285,075,424	–0–
1979	279,347,897	–0–	279,347,897	–0–	279,347,897	–0–
1980	386,309,467	–0–	386,309,467	909,675	386,309,467	–0–
1981	351,829,617	–0–	351,829,617	1,529,850	351,829,617	–0–
1982	366,426,383	–0–	366,426,383	1,592,831	366,426,383	–0–
1983	276,860,479	–0–	276,860,479	3,378,247	276,860,479	–0–
1984	346,847,000	–0–	346,847,000	324,128	340,406,803	6,440,197
1985	364,938,807	–0–	364,938,807	37,836,454	364,938,807	–0–
1986	268,661,676	–0–	268,661,676	242,189,355	242,189,355	26,472,321
Total Regular ODS	\$8,075,476,749	\$238,186,435	\$7,837,290,314	\$287,760,540	\$7,804,377,796	\$32,912,518
Soviet Grain Programs ¹	\$147,132,626	–0–	\$147,132,626	–0–	\$147,132,626	–0–
Total ODS	\$8,222,609,375	\$238,186,435	\$7,984,422,940	\$287,760,540	\$7,951,510,422	\$32,912,518

¹ No longer operative.

**Table 13: OPERATING-DIFFERENTIAL SUBSIDY ACCRUALS AND OUTLAYS BY LINES—
JANUARY 1, 1937, TO SEPTEMBER 30, 1986**

Lines	Accruals			ODS Paid	Net Accrued Liability
	ODS	Recapture	Net Accrual		
Aeron Marine Shipping	\$ 26,013,769	\$ -0-	\$ 26,013,769	\$ 25,957,497	\$ 56,272
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	693,821,868	10,700,587	683,121,281	683,121,281	-0-
American Mail Lines ³	158,340,739	7,424,902	150,915,837	150,915,837	-0-
American President Lines ³	1,104,900,418	17,676,493	1,087,223,925	1,083,722,112	3,501,813
American Shipping	21,139,154	-0-	21,139,154	19,825,629	1,313,525
American Steamship	76,462	-0-	76,462	76,462	-0-
Aquarius Marine Co.	25,307,237	-0-	25,307,237	24,063,921	1,243,316
Aries Marine Shipping	25,349,168	-0-	25,349,168	25,266,107	83,061
Atlantic & Caribbean S/N ¹	63,209	45,496	17,713	17,713	-0-
Atlas Marine Co.	24,025,170	-0-	24,025,170	22,874,779	1,150,391
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.	46,536,401	-0-	46,536,401	45,129,482	1,406,919
Delta Steamship Lines	575,053,817	8,185,313	566,868,504	566,868,504	-0-
Ecological Shipping Co.	4,968,943	-0-	4,968,943	4,968,943	-0-
Farrell Lines	576,649,833	1,855,375	574,794,458	573,177,051	1,617,407
Prudential Lines ⁴	642,057,851	24,223,564	617,834,287	616,788,736	1,045,551
Gulf & South American Steamship ⁵	34,471,780	5,226,214	29,245,566	29,245,566	-0-
Lykes Bros. Steamship	1,441,247,718	52,050,598	1,389,197,120	1,378,907,054	10,290,066
Margate Shipping	72,032,744	-0-	72,032,744	70,269,852	1,762,892
Moore McCormack Bulk Transport	60,634,762	-0-	60,634,762	57,219,928	3,414,834
Moore McCormack Lines ⁶	724,988,608	17,762,445	707,226,163	706,075,915	1,150,248
N.Y. & Cuba Mail Steamship	8,090,108	1,207,331	6,882,777	6,882,777	-0-
Oceanic Steamship ⁵	113,947,681	1,171,756	112,775,925	112,775,925	-0-
Ocean Carriers	37,938,592	-0-	37,938,592	35,612,486	2,326,106
Pacific Argentina Brazil Line ¹	7,963,936	270,701	7,693,235	7,693,235	-0-
Pacific Far East Line ⁶	283,693,959	23,479,204	260,214,755	260,214,755	-0-
Pacific Shipping Inc.	18,622,900	-0-	18,622,900	18,587,875	35,025
Prudential Steamship ¹	26,352,954	1,680,796	24,672,158	24,672,158	-0-
Sea Shipping ¹	25,819,800	2,429,102	23,390,698	23,390,698	-0-
States Steamship	231,997,100	5,110,997	226,886,103	226,886,103	-0-
United States Lines ⁷	747,814,309	54,958,689	692,855,620	692,102,523	753,097
Waterman Steamship	257,512,664	-0-	257,512,664	256,555,766	956,898
Worth Oil Transport	17,851,195	-0-	17,851,195	17,389,795	461,400
South Atlantic Steamship ¹	96,374	84,692	11,682	11,682	-0-
Seabulk Transmarine I & II, Inc.	20,649,354	-0-	20,649,354	20,305,657	343,697
Equity	629,504	-0-	629,504	629,504	-0-
Total Regular ODS	\$8,075,476,749	\$238,186,435	\$7,837,290,314	\$7,804,377,796	\$32,912,518
Soviet Grain Programs ⁹	\$147,132,626		\$147,132,626	\$147,132,626	\$-0-
Total ODS	\$8,222,609,375	\$238,186,435	\$7,984,422,940	\$7,951,510,422	\$32,912,518

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., Inc.

⁶ Went into receivership August 2, 1978.

⁷ Ceased to be subsidized line in November 1970 but returned as a subsidized carrier in January 1981.

⁸ Purchased by United States Lines October 1983.

⁹ No longer operative.

Table 14: ODS CONTRACTS IN FORCE—SEPTEMBER 30, 1986

A. Liner Trades:

Operator and Contract No.	Contract Duration	Number of Subsidized Ships	Service (Trade Route/Area)	Annual Sailings	
				Minimum	Maximum
American President Lines, Ltd. MA/MSB-417	1-01-78 to 12-31-97	23	Transpacific Services: ¹	72	108
			California/Far East Line A (TR 29)		
			California/Far East Line A Extension (TRs 17, 28, 29) ^{2, 3}	18	28
			Washington-Oregon/Far East Line B (TR 29)	54	80
			Washington-Oregon/Far East Line B Extension (TRs 17, 28, 29) ⁴	6	—
Farrell Lines, Inc. MA/MSB-352	1-01-76 to 12-31-95	3	U.S. Atlantic/West Africa (TR 14-1) ^{5,6}	20	38
Farrell Lines, Inc. MA/MSB-482	1-01-81 to 12-31-2000	4	U.S. Atlantic/Mediterranean Service (TRs 10, 13) ⁶	44	66
Lykes Bros. Steamship Co., Inc. MA/MSB-451	1-01-79 to 12-31-98	23	U.S. Gulf/U.K.-Continent (TR 21) ⁷	36	60
			U.S. Gulf & S. Atlantic/Mediterranean (TR 13) ⁸	42	48
			U.S. Gulf/Far East (TR 22) ^{8, 9, 10, 11}	36	60
			U.S. Gulf/South & East Africa (TR 15-B) ^{8, 9, 12}	18	24
			U.S. Atlantic and Gulf/West Coast South America (TR 31/2) ¹³	24	48
			Great Lakes/Mediterranean-India (Trade Area 4) ⁹	3	10
			U.S. Pacific/Far East, North (TR 29) ¹¹	20	80
U.S. Pacific/Far East, South (TR 17/29) ¹¹	20	20			
Prudential Lines, Inc. MA/MSB-421	1-01-78 to 12-31-97	3	U.S. North Atlantic/Mediterranean (TR 10) ¹⁴	24	36
United States Lines, Inc. MA/MSB-483	6-29-82 to 6-29-87	4	U.S. North Atlantic/Western Europe (TR 5, 7, 8, 9/11) ¹⁵		105
		11	U.S. Atlantic and Pacific/Far East (TR 12/29)	70	53
Addendum No. 4 to amended and restated MA/MSB-483	7-08-83 to 12-31-95	0	U.S. Atlantic & Gulf/Australia New Zealand (TR 16) ¹⁶	16	21
United States Lines (S.A.) Inc. MA/MSB-338 (formerly Moore-McCormack Lines, Inc.)	1-01-75 to 12-31-94	1	U.S. Atlantic/East Coast South America (TR 1) ¹⁷	40	70
			U.S. Atlantic/South & East Africa (TR 15-A) ¹⁸	22	36
MA/MSB-353 (formerly Delta Steamship Lines, Inc.)	1-01-76 to 12-31-95	3	U.S. Gulf/East Coast South America (TR 20) ¹⁹	26	53
MA/MSB-425 (formerly Delta Steamship Lines, Inc.)	6-17-78 to 12-31-97	8	U.S. Atlantic/Caribbean (TR 4) ¹⁷	22	33

Overall maximum not to exceed 330

(Continued on page 15)

Table 14: (Continued)

Operator and Contract No.	Contract Duration	Number of Subsidized Ships	Service (Trade Route/Area)	Annual Sailings	
				Minimum	Maximum
Waterman Steamship Corp. MA/MSB-115	6-04-71 to 6-03-91	3 ²⁰	U.S. Atlantic-Gulf/India, Persian Gulf & Red Sea, Indonesia, Malaysia, Singapore, Brunei (TRs 18, 17) ²¹	30	40
Waterman Steamship Corp. MA/MSB-378	10-26-76 to 10-25-96	0 ²²	U.S. Atlantic-Gulf/Far East, Indonesia, Malaysia, Singapore, Brunei (TRs 12, 22, 17) ²¹	8	12
Waterman Steamship Corp. MA/MSB-450	11-21-78 to 11-20-98	0 ²³	U.S. Gulf/Western Europe (TR 21)	24	35
Total Liner Trades		86			

¹ Dual service privileges provide that full containerships may call at both California and Washington-Oregon, with voyages originating in California being Line A sailings, and voyages originating in Washington-Oregon being Line B sailings; however, both types of such voyages shall be counted toward maximum sailings in both Lines A and B, with the outbound and inbound portions of the sailings being counted and applied separately.

² Service to/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 Farrell is also permitted to make 12 sailings annually from the U.S. Gulf to West Africa.

⁶ Farrell owns one LASH vessel, AUSTRAL RAINBOW, which is eligible to operate with subsidy on TR 10/13 or 14-1.

⁷ Principally, Lykes operated Sea Barge Carriers on TR 21. Each sailing of a Sea Barge Carrier counted as two sailings toward the contractual minimum/maximum of 36/60; thus, actual sailing min/max for Sea Barge Carriers is 18/30. The Sea Barge Carriers were traded into the Reserve Fleet in September 1986. Four containership are currently operated on TR 21.

⁸ Lykes is permitted to make 24 sailings annually between U.S. North Atlantic and Mediterranean ports on a privilege basis in conjunction with required service on TR 13, 15-B, 22, and TA 4.

⁹ Lykes has the option to perform additional sailings on TRs 22 and 15-B over maximum sailings if the minimum sailings are made on all other services: On TR 22, nine additional sailings; on TR 15-B, five additional sailings. The overall maximum must not exceed 330 annual sailings.

¹⁰ Subject to stipulation that a minimum of 12 and a maximum of 30 sailings per annum shall include ports in the following described area: Indonesia and Malaysia (including Singapore).

¹¹ Except on TR 29 and TR 17/29, one sailing by a C7-S-95a in any service of the operator shall count as 1 1/4 sailings against the contractually required minimum and maximum in such services. Dual service privileges provide that sailings made by vessels calling at both U.S. Gulf and U.S. Pacific ports count toward the minimum and maximum sailings on TR 22 and on TR 17/29. Lykes stopped service on TR 29 and TR 17/29 in July 1986.

¹² Lykes is also permitted to make 12 sailings annually from the U.S. Gulf of West Africa.

¹³ Caribbean Subservice—a maximum of 24 sailings per annum may provide limited TR 19 service exclusively between U.S. Gulf ports and ports on the Atlantic coast of the Republic of Panama, the former Panama Canal Zone, and the north coast of Colombia.

¹⁴ Prudential Lines TR 10 service was temporarily suspended in May 1986.

¹⁵ No more than 8 vessels may be operated with subsidy on TR 5-7-8-9/11 at any one time and no more than 11 vessels may be operated with subsidy on TR 12/29 at any one time, except when the exercise of interchange and transfer privilege creates a temporary overlap of subsidized voyages. One sailing by a C8-S-85c/d vessel on TR 5-7-8-9/11 shall count as two sailings against the contractually required minimum and maximum sailings on such service and each such vessel operated with subsidy on TR 5-7-8-9/11 shall count as two vessels towards the limitation of eight vessels to be operated at any one time on the service. Operation in 1986 is with four C8 vessels. In third quarter 1986, USL realigned ships and services, serving TR 5-7-8-9/11 with 2 C6-M-F146a, each sailing counting as two, and two Lancer vessels, subsidized, plus phasing in unsubsidized TR 29-only transpacific service.

¹⁶ Subsidized service with no more than 4 vessels may commence at any time after one year after execution of contract addendum adding the TR 16 service, until a reasonable period of time after delivery of the operator's twelfth Jumbo Econsip (Sept. 1985).

¹⁷ Vessels of the Operator may provide dual service on TR 1 and TR 4 services; a vessel calling at ports on both services counts toward minimum and maximum sailings specified for each service.

¹⁸ USL (S.A.) stopped operating direct subsidized U.S.-flag service on TR 15-A in February 1986.

¹⁹ USL (S.A.) stopped operating a direct subsidized U.S.-flag service on TR 20 in December 1985.

²⁰ Between March and July 1984, Waterman sub-bareboat chartered three of the six vessels assigned to the contract back to Central Gulf Lines, from which they had been bareboat chartered.

²¹ Waterman is to provide a minimum of 12 and a maximum of 18 sailings annually to the Indonesia, Malaysia, Singapore, Brunei (TR 17) area under Contract Nos. MA/MSB-115 and MA/MSB-378.

²² Both vessels which had previously been assigned to the contract were turned in to MARAD under custodial agreements, and are currently at NDRF Beaumont.

²³ Waterman is authorized to operate its LASH vessels assigned to other contracts on TR 21.

Table 14: (Continued)**B. Bulk Trades:**

Operator and Contract No.	ODS Agreements		Number of Subsidized Ships 9/30/86	Service	Annual Sailings
	Contract Effective Date	Contract Termination Date			Minimum No. of Days
Aeron Marine Shipping Co. MA/MSB-166	10-10-74	10-09-94	0 ¹	Worldwide Bulk Trade	335
American Shipping, Inc. MA/MSB-272	4-14-76	4-13-96	1	Worldwide Bulk Trade	335
Aquarius Marine Co. MA/MSB-309	10-15-75	10-14-95	1	Worldwide Bulk Trade	335
American Maritime Transport, Inc. MA/MSB-129	8-09-73	8-08-93	2	Worldwide Bulk Trade	335
American Maritime Transport, Inc. MA/MSB-166A	10-10-74	10-09-94	1	Worldwide Bulk Trade	335
Asco-Falcon II Shipping Co. MA/MSB-439	5-24-81	5-23-2001	1	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
Equity Carriers I, Inc. MA/MSB-439	5-24-81	5-23-2001	1	Worldwide Bulk Trade	335
Equity Carriers III, Inc. MA/MSB-439	5-24-81	5-23-2001	1	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
Ocean Carriers, Inc. MA/MSB-167	4-03-76	4-02-96	4	Worldwide Bulk Trade	335
Seabulk Transmarine I, Inc. MA/MSB-440	3-27-81	3-26-2001	1	Worldwide Bulk Trade	335
Seabulk Transmarine III, Inc. MA/MSB-442	9-20-81	9-19-2001	1	Worldwide Bulk Trade	335
Total Bulk Trades			23		

¹ The vessel ARCHON has been approved for subsidized operation. However, Aeron has not executed a contract addendum to place the ship in subsidized service.

Table 15: FOREIGN TRANSFERS AND OTHER SECTION 9 APPROVALS—FY 1986 ¹

A. Program Summary:	Number	Gross Tons		
U.S. PRIVATELY OWNED VESSELS				
Transfers to foreign ownership and/or registry				
Vessels of 1,000 gross tons and over	69	567,062		
Vessels under 1,000 gross tons				
Commercial Craft	218	49,964		
Pleasure Craft	104	2,788		
Subtotal	322	52,752		
Total	391	619,814		
Charters to Aliens				
Vessels of 1,000 gross tons and over				
Approvals	34			
Modifications	6			
Terminations	2			
Vessels of under 1,000 gross tons				
Approvals	27			
Modifications ²	20			
Terminations	2			
Contracts of Affreightment				
Approvals	3			
Modifications	1			
Violations				
Reported	59			
Mitigated or Settled	49			
Rescissions (Sales to Aliens)			9	
Stock Transfers to Aliens			5	
Modifications (Sales to Aliens)			1	
Mortgages to Aliens			1	
U.S. GOVERNMENT-OWNED VESSELS	0	0		

¹ Approvals granted by the Maritime Administration pursuant to section 9, Shipping Act, 1916, as amended.

² Involving 569 vessels.

Table 15: (Continued)**B. Foreign Transfer Approvals—Vessels of 1,000 Gross Tons and Over**

	Pursuant to Section 9 (U.S. Owned and U.S. Documented)		
	No. of Vessels	Gross Tons	Average Age
Tankers	11	178,501	38.91 yrs
Cargo	22	265,755	38.50 yrs
Miscellaneous	36	122,806	13.19 yrs
Total	69	567,062	
Recapitulation by Nationality	Number	Gross Tons	
Bahamian	2	7,257	
British	1	7,501	
Canadian	2	9,891	
Colombian	2	2,042	
Liberian	4	23,867	
Mexican	3	5,674	
Micronesian	1	1,738	
Netherlands	2	13,456	
Panamanian	5	25,730	
Paraguayan	2	4,296	
China (<i>mainland</i>)	1	6,031	
Trinidad	1	2,741	
United Arab Emirates	2	13,260	
Venezuelan	4	4,647	
Total	32	128,131	
Sale to Domestic Alien-Controlled Corporation	6	10,779	
Sale to Alien for Scrapping	31	428,152	
Total	37	438,931	
GRAND TOTAL	69	567,062	

Chapter 3

Domestic Operations

About one billion tons of cargo is moved each year in the domestic waterborne commerce of the United States. This segment of the American merchant marine includes the Great Lakes, inland waterways, and intercoastal, coastwise, and domestic offshore trades.

Great Lakes

On September 30, 1986, the U.S. Great Lakes fleet consisted of 105 self-propelled vessels of 1,000 gross tons and over, of which 47 were active. (See Table 16.)

Dry bulk cargoes such as iron ore, coal, and limestone are the primary cargoes for waterborne commerce in the Great Lakes. During the 1986 shipping season, through September, over 86.3 million net tons were carried from region mines to various

steel mills and power generating facilities. The major commodity, iron ore, totaled 36.5 million tons, followed by coal with 24.9 million tons, and limestone with 14.1 million tons.

Lake vessel scrapping continues to be a strong activity as fleet operators dispose of outdated vessels. A total of 13 dry-bulk vessels of 241,340 tons capacity and 2 tankers of 13,166 tons capacity, were either scrapped or converted to non-transportation use. The average age of these "fresh-water" vessels was 51 years.

In July 1986, LTV Steel filed for reorganization under Chapter 11 of the Bankruptcy Code, invalidating the long-term contracts with lake vessel operators for carriage of iron ore, coal, and limestone. These contract freight rates were replaced by spot market rates at nearly half the 1984 revenue level.

Another significant event which caused a decline in domestic dry-bulk tonnage was the work stoppage when USX Corp. failed to reach a labor agreement. The work stoppage, claimed by the union to be a lockout, started August 1 and idled steel mills and caused the lay-up of nine company-owned vessels.

The region's steel-producing industry was undergoing considerable restructuring during the reporting period. Some small mills were turning to lower cost imported ore and semi-finished steel in order to remain competitive. This foreign sourcing activity, while not yet significant in tonnage, was expected to create further downsizing of the U.S. Great Lakes fleet.

Inland Waterways

In calendar year 1985 (the last year for which statistics are available) 606 million short tons of traffic moved on the inland waterways of the United States, compared with 619.6 million short tons in 1984. The cargo consisted primarily of bulk commodities and raw materials moved in barges.

More than 280 million tons, or 46.2 percent of the total annual shipments, were coal, coal products, crude oil, and petroleum products. Some of these cargoes moved to power plants which could not otherwise have been supplied.

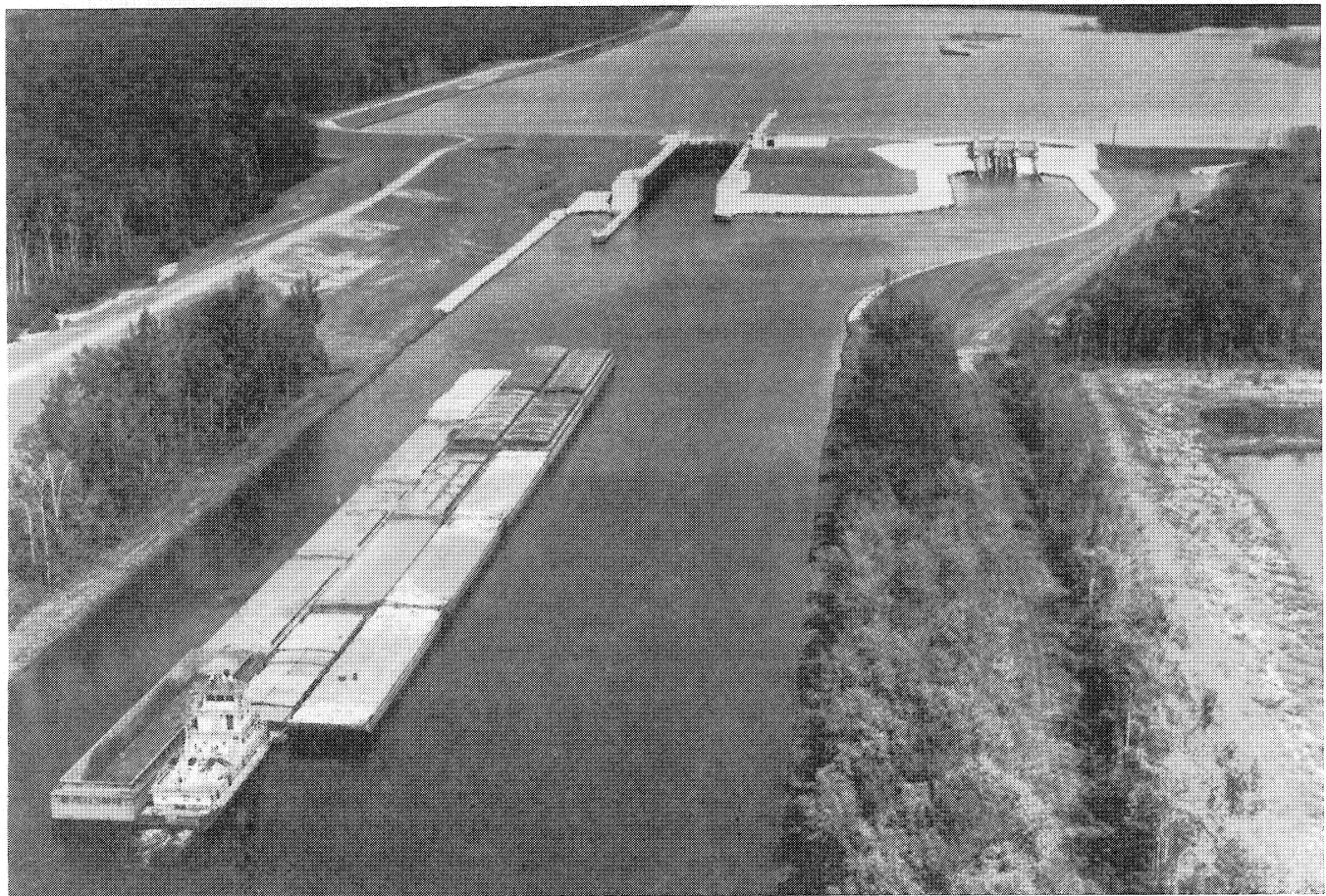
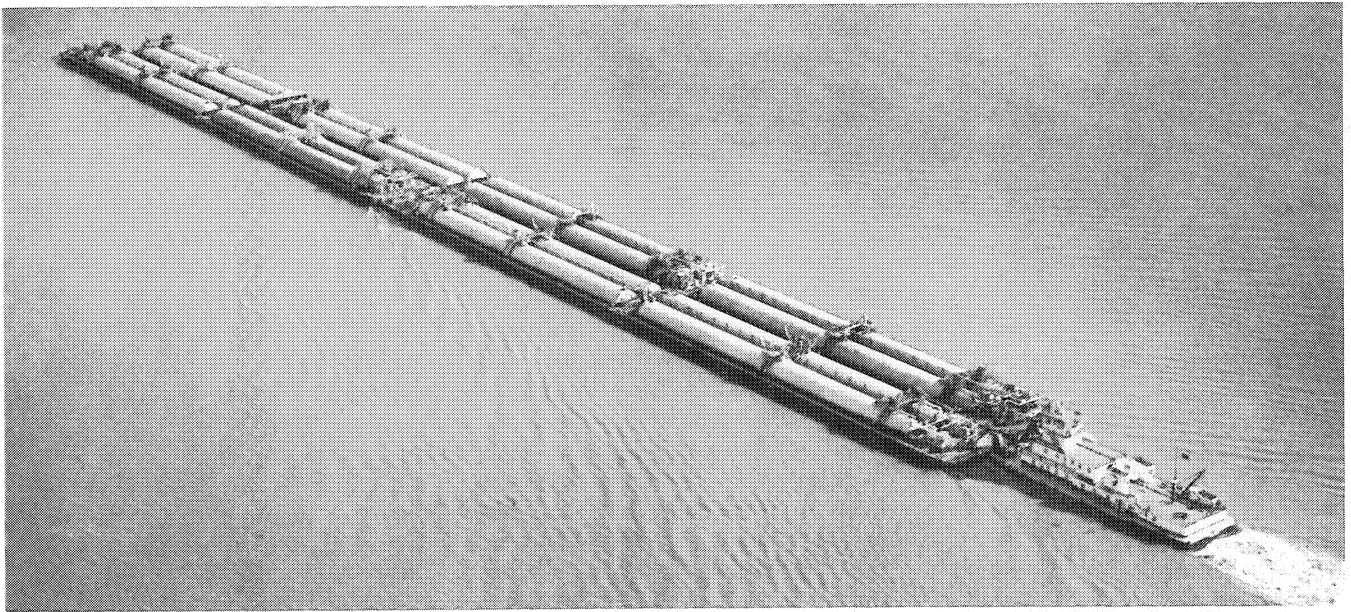
Shipments of chemicals and allied products totaled approximately 104

Table 16: U.S. GREAT LAKES FLEET¹—SEPTEMBER 30, 1986

	Vessels	Gross Registered Tons	Estimated Deadweight Tons
Total	105	1,345,358	2,497,662
Bulk Carriers	92	1,285,918	2,469,375
Active	46	776,105	1,520,390
Temporarily Inactive	18	228,217	437,625
Laid-Up Inactive (More than 12 months)	28	281,596	511,360
Tankers	4	19,465	28,287
Active	0	—	—
Temporarily Inactive	4	19,465	28,287
Others ²	9	39,975	—
Active	1	3,968	—
Temporarily Inactive	0	—	—
Laid-Up Inactive (more than 12 months)	8	36,007	—

¹ Self-propelled vessels of 1,000 gross registered tons and over.

² Includes railroad car ferries, auto ferries.



The MV NATIONAL GATEWAY is shown with a 20,100-ton anhydrous ammonia tow on the lower Mississippi River. On the Tennessee-Tombigbee Waterway, the YAZOO powers a 15-barge tow.

million tons or 17 percent of inland waterways' cargoes. Farm products for domestic and export markets provided 58 million tons or 9.6 percent of inland waterways' cargoes.

Overtonnaging was a serious problem at the beginning of the FY 1986 reporting period. A program sponsored by the United States Department of Agriculture utilized about 2,000 covered hopper barges for grain storage—reducing excess barge tonnage by about two-thirds. Grain rates, however, had increased about 65 percent by August 1986, with an additional 35 percent increase expected by year's end.

On the Tennessee Tombigbee Waterway, the newest waterway system linking the Tennessee River with the Gulf via Mobile, Alabama, cargo doubled in the first 6 months of 1986 to 1.8 million short tons compared with 1.7 million short tons for the entire 1985 calendar shipping year.

Domestic Operations

The domestic waterborne commerce of the United States exceeds its waterborne foreign trade shipments in terms of cargo tonnage, number of vessels, and capacity. The domestic segment of the American merchant fleet serves the Great Lakes, the inland waterways, and the coastwise, intercoastal, and domestic offshore trades.

Domestic Ocean Trades

The number and capacity of self-propelled vessels in the domestic ocean trade at the close of FY 1986 showed little change over the opening levels, at 168 and 9.5 million deadweight tons (dwt). However, there was as much as 10 percent upward variation in both number of vessels and capacity during the year.

No new vessels were delivered for commercial domestic ocean service during the year, nor were any new shipbuilding orders placed for that service.

The Alaskan North Slope crude oil trade saw 56 U.S.-flag and 8 foreign-flag tankers carrying an estimated 96 million long tons, an increase of 4.8 million tons or 5.3 percent over

the FY 1985 level. A total of 985 voyages were made from Valdez.

Ports in the Lower 48 States, Alaska and Hawaii, and Puerto Armuellas in Panama (for transshipment to the Gulf and East Coast) were served by U.S.-flag vessels. Foreign-flag ships served the U.S. Virgin Islands (a refining point) and St. Lucia (a storage point) via Cape Horn.

To compensate for a temporary non-availability of enough domestic trade tankers of suitable size for the North Slope crude trade, MARAD authorized one very large crude carrier (VLCC) and one 90,000-dwt. tanker built with the aid of CDS (construction-differential subsidy) to enter the domestic trade on a short-term basis. Federal regulations permit transfer of a CDS-built tanker to the Alaskan oil trade under certain conditions for up to 6 months of any 12-month period. A pro rata payback to the Government of CDS for the time spent in domestic service is required.

An additional vessel owner availed itself of the one-year period for CDS tanker owners to repay the unamortized CDS with compound interest, thereby gaining permanent eligibility to operate the vessels in domestic trade. The VLCC BROOKLYN repaid \$19.3 million.

The Caribbean terminal of the Trans-Panama Pipeline at Chiriqui Grande, Panama, loaded shipments for 30 U.S.-flag tankers. These vessels made 459 voyages to assorted U.S. Gulf and Atlantic ports, carrying an estimated 31 million long tons. In FY 1986, the average daily flow rate of the pipeline was just over 600,000 barrels; the maximum design rate is 800,000 barrels per day. Twenty-four U.S.-flag tankers carried 40 percent of the Virgin Islands refined products trade for FY 1986, a decrease of 18 percent over FY 1985.

Other Domestic Shipping Activities

In other domestic shipping activities during FY 1986:

- MARAD continued to work with the Department of Energy, the Customs Service, and industry representatives to devise a

means of assuring adequacy of U.S.-flag shipping for the distribution of any crude oil drawn down from the Strategic Petroleum Reserve (SPR).

- The Agency continued to support domestic shipping governed by the Jones Act and related coastwise laws, particularly in the area of shipments of unusual size or weight. Advice was also provided to the Customs Service on two requested waivers involving use of foreign-built vessels.

Charter Market Activity

The Alaskan crude oil trade and product shipments between U.S. Gulf and Atlantic Coast ports remained the two key trades for U.S.-flag tankers in FY 1986.

Tanker surpluses in the handy-sized range were partially offset by MSC charters to transport oil for the SPR. Thirty-four tankers with a total capacity of 2.4 million tons remained in lay-up for most of the fiscal year. As noted earlier, the Alaskan oil trade provided employment for much of the remaining domestic tanker fleet.

The U.S. Gulf to West Coast tanker trades remained slow in FY 1986. This was primarily due to increased crude and refined petroleum imports and, secondarily, to increased pipeline throughput.

At the close of this reporting period, freight rate in the Jones Act tanker trades were essentially unchanged from levels of 1985. Although the majority of the tankers involved in this trade were proprietary vessels either owned or long-term chartered and operated by the oil companies, a significant single-voyage market continued for independent tanker operators.

Offshore Drilling

As of September 30, 1986, U.S.-based drilling contractors owned 439 offshore, mobile exploratory drilling rigs (excluding tankers). Also on that date, 241 rigs, of which 235 were U.S.-owned and operated, were

located in U.S. waters. (Two hundred twenty-six of the U.S.-owned rigs were located in the U.S. Gulf of Mexico.)

Over 800 large (150-foot length overall or greater) U.S.-flag offshore service vessels were available to service these rigs. An estimated 87 percent were supply or combination tug/supply vessels. Approximately 1,200 crew, utility and multi-function vessels, along with 100 self-elevating maintenance barges, were available to supply and service offshore drilling facilities.

During FY 1986, the utilization rate for mobile rigs in the Gulf plunged to a low of 27 percent. Operators of jackup rigs caught the brunt of the downturn. Low utilization levels reflected cuts in capital expenditures for oil and gas exploration and development. By March 1986 most of the major oil companies had cut their 1986 capital expenditures budgets some 30 to 40 percent from originally planned levels. The reduction in available funds for offshore oil and gas exploration and development can be traced directly to the collapse of OPEC oil price supports. By the end of September 1986, the average OPEC price for a barrel of crude oil

was \$15, compared to \$28 per barrel a year earlier.

The gross oversupply of equipment, combined with the prognosis for weak and unstable oil and gas prices, resulted in a further decline in the offshore contract drilling services industry. Day rates fell to the point where they often did not cover operating costs. The industry was forced into a massive financial restructuring that included several mergers and the sale or scrapping of noncompetitive equipment. Nonetheless, severe financial difficulties persisted for many operators, forcing several to liquidate their assets and others into Chapter 11 Bankruptcy. The sale or scrapping of vessels brought little financial relief as market values for secondhand rigs and support vessels fell to historically low levels.

After many attempts at achieving debt restructuring, MARAD initiated foreclosure proceedings with respect to many of the defaulted vessels financed with the aid of Title XI ship financing guarantees. By the end of FY 1986 the agency had taken title to 73 offshore service vessels and 5 offshore mobile rigs. In an attempt to reduce the oversupply of offshore

drilling equipment and service vessels, tenders for resale were sought from non-oil and gas concerns and from nationally owned oil companies intending to use equipment in noncompetitive service.

The Department of Interior held two Gulf of Mexico area-wide lease auctions during FY 1986. The latest offerings generated only modest interest due to the backlog of unworked lease tracts remaining from the 1983-84 area-wide sales. With the majority of leases from the 1983 sales due to expire in 1988, drilling activity increased somewhat towards the end of the fiscal year. Several major oil companies farmed out acreage to independent drilling contractors in an attempt to keep it from reverting to Government control.

At the end of FY 1986, there were 12 offshore mobile rigs on order to the account of U.S.-based drilling contractors. Only one was with a U.S. yard. The 12 rigs include 2 jackups and 10 semisubmersibles. All of the orders originated prior to the start of FY 1986. No new rigs were delivered to U.S. firms during the fiscal year.

Chapter 4

Market Development

The Maritime Administration (MARAD) engages in comprehensive marketing programs designed to increase U.S.-flag participation in the Nation's oceanborne foreign commerce. The programs concentrate on market research and marketing assistance to U.S.-flag operators, improvement of communications between these carriers and shippers, and direct consultation with firms active in international trade.

Marketing Program

MARAD's marketing program is conducted in cooperation with Agency offices strategically located throughout the country. During FY 1986 trade specialists assigned to regional and area offices consulted with transportation policymakers of nearly 1,200 firms to encourage use of U.S.-flag vessels for the carriage of their oceanborne commerce.

Voluntary reports from carriers and shippers indicate that some \$4.8 million in ocean freight revenues for U.S.-flag vessels resulted from these consultations. Over the last 5 years, it is estimated that more than \$101 million in additional revenue for U.S.-flag carriers has been generated by this program.

During FY 1986, U.S.-flag operators continued to use MARAD resources to strengthen and reinforce their own competitive marketing initiatives. Under the Market Lead System, six reports providing market intelligence from private and Government sources were distributed to vessel operators. These letters identified close to 200 individual business opportunities having cargo potential for U.S.-flag carriers.

MARAD actively participated in 63 U.S. seminars, forums, workshops, and other meetings dealing with international trade in FY 1986. Attended by shippers, carriers, freight forwarders, and other maritime inter-

ests, these meetings provided an opportunity to discuss and exchange views on changing transportation economics and practices. They also enabled the Agency to brief several thousand executives on the national benefits which result from patronage of U.S.-flag services.

Market Analysis and Planning

The Market Analysis and Planning Program is MARAD's primary area of research aimed at enhancing the U.S.-flag fleet's competitiveness, revenues, and profitability. It also assists in developing Agency policy on major issues with market impacts, in gauging the state of the industry, and in guiding the development of effective maritime marketing programs.

Market information activities included the issuance of a periodic report on U.S. imports and exports transshipped through Canada for 1984.

During the year, MARAD also further improved information procedures to provide quick access to cargo data. As a result, information concerning cargo movements between U.S. and foreign ports is available within 45 days of loading at the port of exit.

Bilateral Cargo Monitoring

MARAD continued to monitor cargo movements between the United States and its trading partners. While numerous trades were examined, 11 countries received special attention due to changing trade conditions, unilateral actions on their part, or the existence of bilateral trade agreements.

Waterborne liner cargo moving between the United States and China continued to be monitored in fiscal year 1986 due to the prior existence of a bilateral maritime agreement covering that trade and subsequent meetings exploring the possibilities for a new agreement.

In calendar year 1985, the oceanborne trade between the United States and China totalled 6.7 million tons valued at \$4.8 billion, an increase of approximately 30 percent

over the previous year. U.S.-flag vessels carried an adjusted 6 percent by weight and 21 percent by value, representing a modest increase in U.S.-flag market share.

Preference Cargoes

MARAD is responsible for monitoring compliance with the cargo preference laws of the United States and encouraging Federal agencies to ensure that the U.S.-flag fleet receives the maximum cargo shares it is entitled to carry under these laws.

The three principal cargo preference laws are:

- The Cargo Preference Act of 1904, which requires all items procured for or owned by the military departments to be carried exclusively on U.S.-flag vessels. (MARAD's oversight responsibilities under the Merchant Marine Act of 1970 [Public Law 91-469] encompass all of the Department of Defense's [DOD's] ocean transportation requirements to ensure that at least 50 percent of the 100 percent requirement is met by the use of privately owned U.S.-flag commercial vessels as required by Public Law 83-664.);
- Public Resolution 17 of the 73rd Congress, which requires that all cargoes generated by the Export-Import Bank (Eximbank) be shipped on U.S.-flag vessels, unless a waiver is granted; and
- The Cargo Preference Act of 1954 (Public Law 83-664), which requires that at least half of all Government-generated cargo subject to the law be transported on privately owned, U.S.-flag commercial vessels available at fair and reasonable rates. As noted below, recent amendments to the Merchant Marine Act, 1936, further require that the percentage of certain agricultural cargoes moving on U.S.-flag vessels increase from 50 to 75 percent over a three-year period commencing in April 1986.

To assure that all cargo preference laws are followed, MARAD monitors the shipping activities of

Table 17: GOVERNMENT-SPONSORED CARGOES—CALENDAR YEAR 1985 ^{1 2}**Public Law 664 Cargoes:**

Shipper	U.S.-Flag Revenue (\$1,000)	Total Metric Tons	U.S.-Flag Metric Tons	Percentage U.S.-Flag Tonnage
Agency for International Development (AID):				
Loans and Grants	79,081	2,264,060	1,071,093	47 ³
P.L. 480—Title II	151,965	2,724,137	1,398,545	51
Section 416	14,585	163,513	89,686	55
Department of Agriculture:				
P.L. 480—Title I	162,443	5,205,067	2,600,054	50
CCC African Food Assistance Program	15,081	337,641	196,322	58
Department of Commerce:				
Agencies	461	957	334	35 ⁴
Department of Defense:				
Foreign Military Sales Credit and MAP/Merger Programs	49,792	151,579	119,798	79 ²
U.S. Corps of Engineers	714	2,791	2,090	75
Department of Energy:				
Bonneville Power Administration	296	890	598	67
Strategic Petroleum Reserve	26,667	5,245,341	2,811,441	54 ⁵
Hydroelectric Program	0	195	0	0 ³
Department of Health and Human Services				
	11	20	13	66
Department of Interior:				
Bureau of Reclamation	3	17	17	100
Other Agencies	16	25	20	80
Department of Justice:				
Federal Bureau of Investigation	50	67	67	100
General Accounting Office				
	4	10	6	60
National Aeronautics and Space Administration				
	87	296	121	41 ⁴
National Science Foundation				
	44	78	43	55
Tennessee Valley Authority				
	117	728	385	53
General Services Administration:				
Stockpile	891	6,723	2,551	38 ³
Other Agencies	735	2,183	1,205	55
Department of Transportation:				
Urban Mass Transportation Administration	6,795	35,840	24,236	66 ²
Federal Aviation Administration	3	2	2	100
Coast Guard	72	85	85	100
U.S. Information Agency				
	346	997	703	71
Department of State:				
Foreign Building Office	554	3,462	2,053	59
Defense Attache Office	16	33	29	88
Other Agencies (not including AID)	43	34	34	100
Other Agencies				
	16	29	19	65 ⁶

Table 17: GOVERNMENT-SPONSORED CARGOES—CALENDAR YEAR 1984^{1 2}—(Continued)

Public Resolution 17 Cargoes:

	Total Freight Revenue	U.S.-Flag Freight Revenue	Percentage U.S.-Flag
Export-Import Bank	\$30,626,000	\$23,824,828	79 ⁷

Cargo Preference Act of 1904 Cargoes:

	Metric Tons	Percentage of Total Troop Support Cargoes
Department of Defense Troop Support Cargoes (Military Sealift Command) ⁸		
U.S.-flag privately owned vessels	12,013,302	85.8
U.S.-flag (vessels) less than 3 years under U.S. registry	68,902	.5
U.S. Government-owned vessels	755,899	5.4
Total U.S.-flag carriage of MSC Troop Support Cargoes	12,838,103	

Shipper	U.S.-Flag Revenue (\$1,000)	Total Metric Tons	U.S.-Flag Metric Tons	Percentage U.S.-Flag Tonnage
Department of Defense Commercial Contractor Cargoes ⁹				
Army Material Command	93	14,155	1,404	10
Air Force	65	7,402	496	6
Corps of Engineers	69	2,792	2,090	75
Defense Logistics Agency	143	29,017	4,789	17
Navy	6,039	15,942	15,675	98
Total U.S.-flag carriage of Department of Defense Commercial Contractors Cargoes	6,049	69,308	24,454	

	Total U.S.-Flag Revenue	U.S.-Flag Metric Tons	Percentage Metric Tons	U.S.-Flag Tonnage
Agency for International Development (AID)/Israeli Agreement-Cash Transfer Program:	\$28,207,011	1,533,699	824,906	53.8 ¹⁰

¹ Includes civilian agencies, Department of Defense (DOD) Foreign Military Sales Program, and a partial listing of DOD commercial contractor shipments. DOD Troop Support cargoes processed by the Military Sealift Command are reported for the first time.

² Several agencies' tonnages are reflected in metric tons for uniformity only. Cargo preference compliance for those programs involving high cube/low density cargo, is achieved on a gross revenue ton basis. Percentages reflected on a weight tonnage basis for such programs do not necessarily represent the exact extent of the program's compliance with the statute.

³ This program did not meet the minimum 50 percent U.S.-flag participation level. Sufficient U.S.-flag service was available on a timely basis which would have enabled the agency to meet the cargo preference compliance requirement.

⁴ Agencies complied with the statute. The imbalance in favor of foreign-flag shipments was due to nonavailability of U.S.-flag service.

⁵ MARAD accounts for the SPR program on the basis of long-ton miles (LTM). In CY 1985, this program provided a total of 17.5 billion LTM of which U.S.-flag carriers derived 8.8 billion LTM or 50 percent.

⁶ Cargo of government and private agencies that generated less than 100 metric tons of cargo in 1985. The agencies which reported in 1985 are: Action; Agriculture Marketing Service; Agriculture Research Service; American Battle Monuments Commission; Animal, Plant Health Inspection Service; Center for Disease Control; Defense Accounting Office; Drug Enforcement Administration; Foreign Agricultural Service; General Accounting Office; Geological Survey; Immigration and Naturalization Service; International Exchange Service, Labor Department; Library of Congress; Narcotics Assistance Unit; National Oceanic and Atmospheric Administration; National Park Service; Peace Corps; Smithsonian Institute; Soil Conservation Service; Treasury Department; U.S. Customs Service; U.S. Trade Representatives; Veterans Administration; Board of International Broadcasting; and Foreign Broadcast Information Services.

⁷ Compliance based on Freight Revenue only.

⁸ As MSC records liner cargo in measurement tons, MARAD has converted these to metric tons using a factor of .293 metric tons per measurement ton. Statistics are shown on a fiscal year (1985) basis, since calendar year data was not provided.

⁹ DOD's contracting activities are subject to the Cargo Preference Act of 1904 (10 USC 2631). P.L. 664 impacts 10 USC 2631 by requiring that privately owned U.S.-flag vessels must be used for at least 50 percent of DOD's 100 percent U.S.-flag requirement. DOD's contractor's must use privately owned U.S.-flag commercial vessels for 100 percent of their cargoes since such cargoes are processed totally within the commercial transportation environment. Data reflects only a partial listing of DOD's contracting activities for the year due to the delayed involvement of MARAD in these contracting activities, and the need by DOD to update its active contracts to reflect the U.S.-flag shipping provisions contained in the Federal Acquisition Regulation (FAR).

¹⁰ While statistics are shown for CY 1985 shipments, Israeli cash transfer program is maintained on a fiscal basis. This reflects the terms of the side letter executed each year between the Government of Israel (GOI) and AID. On a fiscal year (1985) basis, GOI shipped 48.6 percent on U.S.-flag vessels: Total tons FY 1985 1,567,098; U.S.-flag tons, 761,940; and U.S.-flag revenue, of \$25,769,304.

56 Federal agencies, independent establishments, and Government corporations. (See Table 17.) With the exception of the Eximbank, for which records are maintained over the life of a loan or guarantee, statistics for such programs are maintained on a calendar-year (CY) basis.

A computerized reporting system enabled MARAD to process 29,666 bills of lading for CY 1985. These documents covered civilian agencies, some DOD contractor shipments, Eximbank, and most Foreign Military Sales Credit program (FMSC) cargoes. The equivalent of 30,500 bills of lading covering Military Assistance Program (MAP) and FMSC shipments also were processed using computer tapes provided by DOD.

Agencies Not in Full Compliance with Public Law 664

For CY 1985 the Agency for International Development (AID) loans and grants program failed to meet the 50 percent requirement. AID could not substantiate the non-availability of U.S.-flag vessels for 296,782 metric tons of gasoil from points outside the United States. Additionally, AID awarded a contract for the movement of fertilizer to Burma with transshipment. The contract inhibited the full use of U.S.-flag vessels by allowing a foreign-flag vessel to carry the cargo on the major portion of the voyage.

For CY 1985 MARAD has determined that the General Services Administration stockpile program did not meet the 50 percent U.S.-flag requirement. U.S.-flag vessels were available but were denied these cargoes by the receivers in favor of foreign-flag vessels. Accordingly, MARAD has determined this program to be in noncompliance with Public Law 664.

For CY 1985 the U.S. Department of Energy, in its cooperative hydropower projects, failed to meet the 50 percent U.S.-flag requirement. Since U.S.-flag service was available on a regular basis, and the receivers used foreign-flag vessels, MARAD has determined that this program was not in compliance with the Cargo Preference Act of 1954.

Significant Developments in Cargo Preference

The Merchant Marine Act, 1936, was amended in December 1985 by the passage of Section 1142 of the Food Security Act of 1985 (Public Law 99-198). This revised the cargo preference requirements affecting the U.S. Department of Agriculture and the Commodity Credit Corporation (CCC).

The 1936 Act previously provided under section 901(b), in part, that at least 50 percent of the gross tonnage of certain Government-impelled cargoes shall be transported on privately owned U.S.-flag commercial vessels. The amendments now require that certain specified export programs of the CCC be increased beyond the 50 percent U.S.-flag requirement and that U.S. farm products made available at prevailing world prices, with blended credit guarantees or under a barter arrangement, are exempt from cargo preference. An additional 10 percent of the tonnage of these programs shall be transported on U.S.-flag vessels for the 12-month period commencing April 1, 1986. This additional percentage increases to 20 percent for the 12-month period commencing April 1, 1987, and to 25 percent for each 12-month period thereafter. These stepped increases will bring the U.S.-flag share of these cargoes to 75 percent.

Department of Defense

In 1985, MARAD executed agreements with the Departments of Army, Navy, and Air Force, the Corps of Engineers, and the Defense Logistics Agency, covering their commercial contracting activities. Under these agreements, MARAD assists DOD and its commercial contractors and suppliers in securing appropriate U.S.-flag shipping service.

The CY 1985 statistics shown in Table 17 include only a small portion of the commercial contract cargoes generated by these agencies, because the vast majority of DOD's contracts did not contain bills of lading reporting provisions. MARAD will be able to secure these documents for future reports as contracts are modified to reflect MARAD's agreements with the defense agencies.

Tonnages carried by U.S.-flag vessels for troop support cargoes processed by the Military Traffic Management Command and the Military Sealift Command (MSC) are not included in Table 17's DOD contractor shipment statistics. However, MARAD is initiating the reporting of the DOD troop support cargoes processed by the MSC, as a separate listing. A breakdown of this tonnage between U.S.-flag privately owned and U.S. Government-owned vessels is included. The data is provided by the MSC, with no independent MARAD verification. Precise revenue data from the MSC is not available. This report covers activities which occurred in FY 1985.

The Army, Navy, Air Force, and the Corps of Engineers failed to achieve 100 percent U.S.-flag participation in their commercial contracting activities during CY 1985. Only a small portion of foreign-flag participation was due to the non-availability of U.S.-flag vessels. The primary reasons for the shortfalls were the inconsistencies previously existing in the Defense Acquisition Regulation provisions, the absence of appropriate U.S.-flag provisions in the preponderance of DOD's contracts, and some procuring agencies' lack of experience with cargo preference. These problems have been addressed by recent agreements between MARAD and the DOD contracting commands, and by the Federal Acquisition Regulation (FAR), which became effective on April 1, 1984. The FAR clearly states that DOD cargoes are covered by the Cargo Preference Act of 1904, making them subject to a 100 percent U.S.-flag requirement.

Technically, each of the DOD contracting commands failed to meet the requirements of both the Cargo Preference Act of 1904 and Public Law 664. In view of the corrective action agreed to, the shortfalls in compliance are not viewed by MARAD as overt violations of the statutes.

Strategic Petroleum Reserve

In 1977, the U.S. Government announced its intention to store 750 million barrels of crude oil in salt domes along the U.S. Gulf Coast as

a Strategic Petroleum Reserve (SPR). At the end of CY 1985, 493 million barrels of crude oil had been stored at five SPR sites.

The Cargo Preference Act requires the Department of Energy to transport at least 50 percent of the oil in U.S.-flag tankers. In 1977, MARAD and DOE agreed that a long ton/miles formula would be used to determine compliance, rather than total tonnage carried.

In CY 1985, U.S.-flag tankers carried SPR cargo amounting to 8.8 billion long ton/miles (50.3 percent). This carriage generated \$26.7 million in revenue. All shipments in CY 1985 were from foreign sources.

Eximbank

In the Eximbank program, total ocean freight revenues increased from \$23.6 million in CY 1984 to \$30 million in 1985. During 1985 U.S.-flag

operators earned \$23.8 million representing 79 percent of the total ocean freight revenues. The increase in the Eximbank program was attributed to the approval of several new projects that generated ocean shipments during the calendar year.



Cotton being loaded aboard Farrell Lines' EXPORT LEADER in New Orleans was part of 47,700-bale shipment to Zaire and Bangladesh.

Chapter 5

Port and Intermodal Development

MARAD provides research and technical assistance in the management areas of port and intermodal planning and operations to state and local port authorities and private industry. It also develops contingency plans for the utilization of ports and port facilities to meet defense needs in times of national emergency or war. (See Chapter 8.)

Annual Report on Ports

The Secretary of Transportation is required by Public Law 96-371 to submit an annual report to Congress on the status of public ports of the United States. The report for CY 1985 examined the composition of the port industry, highlighted the issues and problems which affect it, and reviewed the importance of U.S. ports to the Nation's economy and military security. It was delivered to the Congress on September 30, 1986. Initial plans for the 1986 report were formulated with a goal of delivery to the Congress early in 1987.

Port and Waterway Development

During FY 1986, MARAD continued to promote the use of the Agency's marine research simulator, located at its Kings Point Computer-Aided Operations Research Facility (CAORF), for testing alternative port channel designs to reduce the costs of maintenance dredging and improvement projects. The Agency also participated in developing data bases and analytical methods needed to estimate the costs of dredging and maintaining navigable channels. These assessments can be used to evaluate various proposed user charges and to measure their direct impact on individual U.S. ports and waterways.

Technical and Research Assistance with Ports

MARAD provided technical and research assistance through programs and projects dedicated to strengthening the role of U.S. ports in national defense and economic development. This required the development of analytical research tools and techniques to improve planning, productivity, and the general efficiency of port management and marine terminal operations. These technical projects were funded on a cost-sharing basis involving State or local port authorities or private sector organizations and MARAD.

For example, in FY 1986 the Agency entered into a cooperative agreement with the five Upper Mississippi River States (Illinois, Iowa, Minnesota, Missouri, and Wisconsin) to carry out a transport economic study of that river's towing industry. Its primary purpose is to define and test efficiency measures that will improve operating costs, capital recovery, and profit of tow operators. The study will also assess infrastructure procedures and recommend actions to improve operating practices. The five states participate as a managing and funding consortium. The Department of Agriculture and MARAD provided matching funds and are members of the study Advisory Committee.

As part of MARAD's cost-sharing research and development efforts with industry, the Agency developed a conceptual design of a port financial management information system with the American Association of Port Authorities (AAPA) and 14 participating ports. The project produced an automated modular design adaptable to the specific requirements of individual ports.

Continuing its efforts to provide the U.S. port industry with analytical planning and management tools, the Agency completed its first update of the *Port Economic Impact Kit*. This update provides a full report plus a description of a hand-calculation method for assessing a port's economic impact. Consistent with current practice, the update also provides

the methodology programmed on a floppy disk for IBM compatible mini- or personal computers. (Information on ordering MARAD publications is contained in Appendix IV.)

During FY 1986 the Agency completed research for an automated methodology to determine the pricing by ports of facilities used by terminal operators based on an existing MARAD formula. The intent is to enable port managers to develop optimum pricing strategies.

MARAD continued development of new port-oriented data systems in FY 1986. In conjunction with the Office of the Secretary of Transportation, the Agency initiated a new mainframe/microcomputer-based information system to generate the foreign trade and transport data needed for international transport negotiations. The system also enhances efforts to promote use of the Nation's ports and the U.S.-flag merchant marine.

In addition, 14 software components were completed in the development and demonstration of an automated Inland River Port Management Information System at the Port of St. Louis. The system will provide other river ports with more rapid access to data needed to make decisions such as capital budgeting and land use.

Port Planning Program

MARAD's FY 1986 cost-shared port and intermodal planning programs included cooperative port-development studies with local, State, and regional port agencies and associations; port-planning and management information systems, including database development; and financial and economic-impact analyses projects. Emphasis during the year was placed on developing generic methodologies usable by any U.S. port or region. This included the development of the appropriate software for use on mini- or personal computers. Projects under this program which were completed, continued, or initiated in FY 1986 are listed on the next page.

Projects Completed	Description
Cost Reduction Proposals for P.L. 480 Cargo	Prepared a set of six proposals to reduce transport costs of government-generated cargo moving under Public Law 480. The proposals were submitted to the U.S. Department of Agriculture, the Agency for International Development and the Office of Management and Budget.
Service Contracts	Evaluated potential U.S. Government cost savings that could be realized through service contracts for commodity transactions and ocean transportation of agricultural export programs.
Laminar Flow/Boundary Air Technology	Updated an analysis of anticipated investment and operating costs compared with other existing systems to discharge bulk cargo vessels anchored offshore. Developed a discounted cash-flow analysis of these revised costs and potential revenues, and prepared a comparison of voyage costs for shipping various tonnages of bulk cargos using laminar flow/boundary air technology.
Port Financial Management System	Designed and developed a generic port financial management information system for the U.S. port industry, through a cooperative agreement with the American Association of Port Authorities involving 14 participating ports.
Port Pricing	Revised and automated the MARAD Port Pricing Formula for the use of port terminal facilities. Ports derive benchmark prices based on this formula and the prices, in turn, form the basis for compensatory tariffs.
Inland River Port Information System	Developed and demonstrated a prototype management information system for the U.S. inland river port industry, at the Port of St. Louis. The system addresses inland port data requirements for management, operations, marketing, and planning.
Marine Terminal Capacity Handbook	Updated the <i>Port Handbook for Estimating Marine Terminal Cargo Handling Capability</i> . The handbook provides a simple and reliable method of estimating the annual cargo-throughput capacity of U.S. ports and marine terminals.
Potential Port Revenue Sources	Monitored the multi-phase, MARAD-sponsored university research contract with the Transportation Center, University of Tennessee, which assessed potential new revenue sources available to inland and ocean U.S. ports.
Terminal Productivity Study	At the request of the National Association of Stevedores, initiated and funded a study and symposium on improving productivity in U.S. marine container terminals. The study was prepared by a committee established by the National Academy of Sciences' Marine Board.
Ongoing Projects	Description
Upper Mississippi River Transportation Economic Study	Signed a Cooperative Agreement with the Iowa Department of Transportation representing a consortium of five Upper Mississippi River States for an economic analysis and modeling of operating efficiencies for river towing companies. The U.S. Department of Agriculture also participates in this project.
Study of Socio-economic and Technological Change at Ports	Continued monitoring a MARAD-sponsored university research project by the Massachusetts Institute of Technology on the impacts of socio-economic and technological change on U.S. ports.
MARAD/Corps of Engineers Memorandum of Understanding	Participated in semi-annual meetings of a joint working committee with the U.S. Army Corps of Engineers, addressing cooperative projects in marine transportation technology systems, port and waterway development, joint research, and applied engineering.
Port Facilities Inventory	Continued updating various segments of the Agency's automated Port Facility Inventory, including the Columbia-Snake River system, all Alaskan ports, and the individual ports of Chicago, Texas City, Galveston, Stockton, and Sacramento.
Small Port Siting Evaluation System	Continued preparation of a report, computer software, and user's guide for an automated model to analyze and evaluate facility sites at small ports.
Projects Initiated	Description
Port Expenditure Survey	Initiated research to update the MARAD report <i>United States Port Development Expenditure Survey</i> which profiles major expenditures for new construction and rehabilitation.
Economic Impact of U.S. Port Industry	Began contractual process for the development of a MARAD input-output model to conduct annual assessments of the national economic contributions of the U.S. port industry.
Waterborne Trade Data Base	In conjunction with the Office of Economics, Office of the Secretary of Transportation, MARAD initiated efforts to update and expand the automated, international waterborne-trade data base used to generate current port and bilateral trade statistics.
Port Facility Inventory Evaluation	Initiated an in-house study of the Port Facility Inventory to evaluate appropriate changes in the hardware, software, and data record configuration.

Port Operations Program

This cost-shared program helps improve productivity in the operation of facilities, equipment, and waterways.

The program also provides planning for emergency operating conditions in time of crisis or war.

Following are FY 1986 completed and ongoing projects:

Completed Projects	Description
Computer Program to Aid Spill Response	In cooperation with the Coast Guard, monitored Phase II of DOT-sponsored university research by Dillard University on an oil and chemical spill response computer program. It is designed to enable regional response teams to use high technology tools, such as microcomputer mapping and laser video disks, to expedite containment and clean-up operations.
Port Vessel Emissions Model	Coordinated the technical review of the MARAD Port Vessel Emissions Model developed by the Port of Long Beach with the Coast Guard, the Environmental Protection Agency, and the American Institute of Merchant Shipping to validate potential use of the model by the maritime industry and environmental regulators.
Publications	Prepared and distributed the 1984 and the 1985 inventories of intermodal equipment owned by American steamship companies and major leasing organizations operating in the United States. Also distributed the publication, <i>Existing and Potential U.S. Coal Export Terminals</i> .
Marine Board Vapor Emissions Study	Provided technical assistance to the National Academy of Sciences' Marine Board study on Vapor Emissions which investigated the state of technology in controlling and recovering hydrocarbon vapors from ships and barges.
Port Study of Ocean Incineration	Completed study of the environmental, safety, facility, and regulatory requirements for the transfer of hazardous materials to ocean incineration vessels at ports.
Ongoing Projects	Description
Regional Community Cargo Release System	Signed a Cooperative Agreement with the Golden Gate Ports Association to develop a generic design of an automated regional Community Cargo Release System for U.S. ports that plan to use the U.S. Customs Automated Commercial System.
Port Shipping Safety	Completed first MARAD Report on Port and Shipping Safety and Environmental Protection.
Projects Initiated	Description
Disposal of Vessel Generated Wastes	Initiated and coordinated a maritime industry-wide meeting with the Environmental Protection Agency (EPA) concerning EPA's February 1986 policy directive on vessel generated wastes. EPA subsequently retracted its position that the Resource Conservation and Recovery Act governs vessel wastes before their removal from the vessel.

Technology Transfer

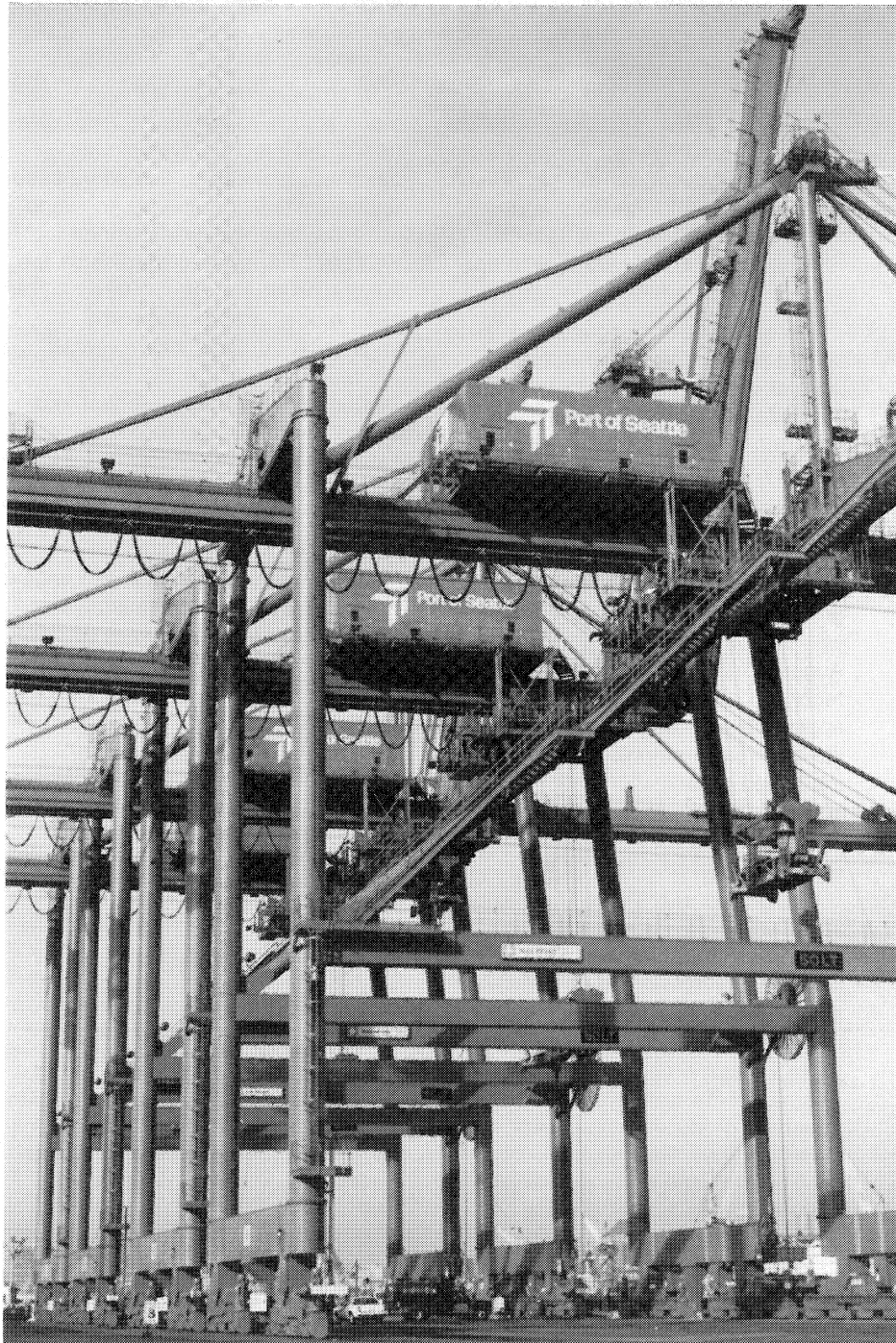
A large share of projects undertaken by MARAD are initiated at port industry request or are proposed as a response to port industry needs. In

each case, results are designed to serve the needs of the widest spectrum of port users, in addition to the proponent. Consequently, the Agency has an active program to acquaint

the port industry with available tools, their benefits, and the procedures for obtaining materials. During FY 1986, the following technology transfer activities occurred:

Transfer Projects	Description
Conference on Barge Fleeting	Cosponsored with the Inland Rivers, Ports and Terminals, Inc., the first National Conference on Barge Fleeting, held in Memphis, TN, as a follow-up to the distribution of MARAD's regional barge-fleeting handbook.
Container on Barge Seminar	In cooperation with Louisiana State University and several industry entities, conducted a seminar on present and potential container-on-barge movements.
Computer-Aided Operations Research Facility (CAORF) Simulations of Port Channel Improvements	Promoted increased Government and industry awareness of the potential of the MARAD ship simulator at CAORF to optimize port channel designs and reduce dredging costs. The Corps of Engineers contracted MARAD during FY 1986 to simulate and evaluate alternative channel improvements at the ports of Oakland and Miami.

Transfer Projects	Description
Multi-purpose Harbor Service Craft	Briefed officials of the New York, NY, Fire Safety and Port and Terminals Departments on the findings of the tests of the Tacoma, WA, prototype harbor service vessel and its flexible advantages to meet port emergencies.
Port Administration and Operation Seminar	Made a presentation on port economics and port pricing at the New York World Trade Institute's annual Port Administration and Operation Seminar for senior port managers of developing countries.
Port Finance Seminar	Made a presentation on MARAD's <i>Port Pricing Formula</i> and port pricing trends in the United States at the American Association of Port Authorities' (AAPA) Port Finance Seminar.
AAPA Annual Port Directors Meeting	Made a presentation on MARAD's major port and intermodal programs to all U.S. port directors at the American Association of Port Authorities' Annual Meeting in Portland, OR.



Part of a \$50 million facelift for the Port of Seattle's Terminal 5, these four new high-speed container cranes have a 50-long-ton capacity, 95-foot lifting height, and 145-foot outreach.

Research and Development

The Maritime Administration's (MARAD's) research program is designed to develop cost-effective means of meeting the Nation's maritime objectives as stated in current laws. An important part of the program is designed to assist the major sectors of the American maritime industry in becoming more competitive. A substantial part of the program is cost-shared with industry, other federal agencies, academic institutions and state and foreign governments. Research and development (R&D) contracts and cooperative agreements awarded in FY 1986 are listed in Appendix III.

Shipbuilding

The National Shipbuilding Research Program in FY 1986 continued technical research related to all ship construction processes. The 10 technical areas involved are facilities/environmental effects; production aids; design/production integration; human resources innovation; standards; welding; industrial engineering; education and training; flexible automation; and surface preparation and coatings.

With a reduction in the Agency's available research funds, emphasis in FY 1986 was placed on the completion of ongoing projects and the transfer of advanced technologies to help improve productivity. Participants in the program included experts from all major U.S. shipyards, supplier industries, marine industry consultants, Government agencies, and academic institutions. In addition to formulating and recommending a FY 1987 research program, these technical experts performed, administered, and monitored previously authorized research.

A number of research projects, many of which were cost-shared, were completed and related reports published during FY 1986. These included:

- *Design for Production Manual*, detailing the logic and steps necessary to design vessels in order to reduce production costs by emphasizing the preparation of technical information in a different sequence, earlier time frame, and a more detailed format;
- *Flexible Production Scheduling System*, describing a phased approach to schedule development that avoids man-hour losses from scheduling and regulating process flows based on insufficient and inaccurate inputs; and
- *Product-Oriented Safety and Health Management*, documenting contributions to organization safety and health programs from the "product-oriented" approach to manufacturing. This features safety and health matters as part of everyday work, with emphasis on small group activities.

Technology transfer functions included publication of the quarterly *Journal of Ship Production*, which presents the results of technical research relevant to the shipbuilding industry. Microfiche libraries of completed shipbuilding research reports were produced and distributed on a continuing basis. The Second National Shipbuilding Research Program's Annual Technical Symposium was held in Williamsburg, VA, August 27-29, 1986. More than 20 technical papers were delivered and approximately 400 representatives of industry, Government, and other interested organizations attended.

Ship's Machinery

The goal of the Ship's Machinery and Outfitting Program is to accelerate the implementation of advanced technology for shipboard power conversion equipment to reduce operating costs. The program's major emphasis has been on alternative low-cost marine fuels, coal-fired propulsion machinery, and diesel engines. Research has been on a cost-shared basis with engine manufacturers, vessel owners and operators, and technology innovators.

During FY 1986, significant progress was made in evaluating the application of ceramic coatings to combustion components of marine

diesel engines. Over 8,000 hours testing of thin-film ceramic coatings in a marine diesel engine was completed.

Research associated with eventual long-term endurance testing of thick-film ceramic coatings was initiated. The objective is to identify generic candidate ceramic coatings being developed by others, either independently or under Department of Energy/Department of Defense-sponsored programs, and to determine their benefits in the form of improved engine efficiency, increased component durability, and alternative fuels utilization.

In cooperation with a major engine manufacturer, a variable-timing, electronic fuel-injection system was designed, fabricated, and shore-base tested. Installation aboard an inland waterway towboat was planned for FY 1987. The system represents the adaptation of a system offered in the 1986 model year of truck-size engines. A contract was awarded to the manufacturer for the design, fabrication, and in-service test and evaluation of a novel turbocharger for marine engines. Known as a three-wheel turbocharger, the device will provide improved fuel economy and transient torque response.

Improved fuel economy and engine torque response is the objective of another contract awarded in FY 1986. Under this contract, a system incorporating a motor-driven blower and turbocharger will be retrofitted on an engine with a gear-driven turbocharger. Another system providing enhanced charge-air cooling was being tested in underway trials aboard an inland waterway towboat.

Fleet Management Technology

The application of computer and communications technology to the operations and management of U.S.-flag shipping companies was the major thrust of the Fleet Management Technology Program in fiscal year 1986.

Principal accomplishments involved the completion of several software development projects for IBM-PC (personal computer) applications in the office and aboard ship. A

number of companies acquired the program called *Part Power Heat Balance*, used by both shipboard and shoreside staffs to produce a heat balance for steam-powered propulsion systems. Through this program, the propulsion-system performance can be tuned to ensure fuel-efficient operation at all ship speeds.

Another program was developed to assist operators of diesel-powered vessels. Entitled *Marine Diesel Fuel Cost and Quality*, it is used by vessel operators to evaluate alternative fuel suppliers and to select, among the fuels of acceptable quality, those having the lowest cost per million BTU. The program also uses laboratory test data of fuel-property values of purchased fuels to give the operator cautions or advisories if the fuel is of poor quality.

Other IBM-PC programs were developed to report and analyze shoreside operating costs incurred by liner vessel operators, conduct strategic planning for liner and bulk operators, and analyze operating costs and vessel performance of a small vessel/tugboat/barge operator.

Ship Performance and Safety

During FY 1986 work continued on the development of a Voyage Monitoring System. This technology permits shipboard operating personnel to obtain timely and accurate measures of fuel consumption attributed to hull roughness, propeller roughness, ship's ballasting and trim, navigation and steering, high winds, and heavy seas. Such information allows operating personnel to make on-the-spot decisions for corrective actions and to determine if these actions result in improved efficiency.

Tests of the system were underway at the beginning of the reporting period. However, the ship being used as a test platform was removed from service. Equipment was removed from the ship and planning commenced for reinstallation on another test platform.

In another project, work was conducted to develop detailed shipyard production methods and cost estimates for sheathing an existing

steel ship hull with a thin copper-nickel alloy. The intent is to eliminate repainting of the ship's bottom to prevent fouling and corrosion, thereby reducing maintenance costs and improving fuel efficiency.

In the Effective Manning Program, work continued on cooperative agreements with two U.S.-flag ship operators for projects to improve the efficiency and productivity of both shoreside and shipboard personnel and to improve the quality of life in the shipboard environment. Smaller crew sizes heighten the necessity of utilizing people efficiently, maintaining safety, and providing a more comfortable environment in which to work and live.

Cargo Systems

With the goal of increasing productivity in marine terminals and intermodal transportation, MARAD's Cargo Handling Cooperative Program (CHCP) conducted research, development, test, and evaluation projects with five U.S.-flag liner carriers during FY 1986.

Tests of radio frequency automatic equipment identification systems at Puerto Rico Marine Management, Inc. terminal at Port Elizabeth, NJ, were concluded. The system, which automatically reads an equipment identification number encoded in a microchip, was proven to function satisfactorily with an accuracy level above 99 percent over a six-month period. Additional testing using underground antennae was continuing at the end of the period, at Matson Terminals, Oakland, CA.

A system which allows direct computer input to container yard inventory data via radio transmission was tested during the year and showed significantly improved operations at U.S. Lines' terminal in Savannah, GA. Total direct savings over the one-year test provided a 6 to 1 return on investment. Additional, non-quantifiable benefits, such as improvements in employee morale, customer services, and vessel turnaround, also were attributed to the system.

Four projects jointly conducted and funded with Department of Defense (DOD) agencies to expand on the application of microchip

technology in logistics were initiated. These projects will test systems to produce automated electronic manifesting and tracking of containerized cargo, automated maintenance and repair data for cranes, tractors, and other mobile equipment, automated storage and transportation information for hazardous materials, and automated updating of the condition of equipment as it passes through the repair cycle. In addition, the U.S. Army is testing the capabilities of microchip hardware to function under conditions it will be subjected to in all transport and handling modes.

The CHCP addressed non-compatibility of microchip systems among manufacturers by calling together potential transportation industry users and microchip systems manufacturers to begin a standardization effort.

Military Sealift Research

Continuing this important program which developed the Sea Shed System and the Auxiliary Crane Ship (T-ACS), MARAD, working with the assistance and cooperation of the Navy, Strategic Sealift Division (OP-421), issued a Request for Proposals and awarded five contracts for research during FY 1986. The major thrust of the program is directed toward the development of low cost, efficient systems which will facilitate the rapid transition from commercial shipping to military sealift in times of national need. Emphasis is placed on those developments which are both commercially sound and also meet military logistics needs and those which make the additions or modifications to existing commercial systems which allow them to meet sealift requirements.

Contracts awarded in FY 1986 cover a broad spectrum of research including improved crane technology, a new method for loading and discharging breakbulk cargo, improved utilization of domestic water transportation assets for commercial and military sealift benefit, the development of modularized acoustic quieting systems for merchant ships, and the examination of the technical

feasibility of using mobile offshore drilling units for temporary offshore port facilities.

CAORF

The Computer-Aided Operations Research Facility (CAORF), operated by MARAD at Kings Point, NY, is a highly sophisticated ship maneuvering research simulator, dedicated exclusively to solving maritime problems.

CAORF realistically simulates vessel operations in port or at-sea in real time using a full-scale mock-up of a ship's bridge and a full-color projected image on a 60-foot diameter screen providing 240 degrees of visibility. A wide variety of safety-related problems can be studied. These include ship control and navigation, bridge layout, collision-avoidance procedures, the design of equipment, and harbor and restricted waterway configurations, including the placement of navigational aids.

The U.S. Navy reimburses MARAD for research in the area of ship-handler training and the U.S. Army Corps of Engineers supports numerous U.S. port development projects.

During FY 1986, the Agency issued a request for proposals for the transfer of CAORF to private operation. MARAD anticipated executing a cooperative agreement early in 1987 to turn the facility over to a private organization for operation as a private venture.

Many research activities continued during FY 1986. The major program effort was in harbor and waterway development, including channel design and waterway improvements to identify optimal dimensions which will permit safe ship transit while minimizing dredging and maintenance costs.

During FY 1986, CAORF completed an extensive multi-year study of the Panama Canal. Modifications to allow two-way traffic of Panamax size vessels in the Gaillard Cut were developed and simulation studies utilized to minimize modification costs.

Studies of harbor design modifications in Oakland, CA, and Miami, FL,

began in FY 1986 with further work planned for FY 1987.

Evaluations of proposed alternative turning basin designs for TRIDENT submarines for the Navy's Strategic Systems Program Office continued during this reporting period. Simulation of TRIDENT submarine operations will help determine tug assist requirements for the Navy.

The U.S. Merchant Marine Academy continued to use CAORF to provide simulated ship-handling experience for deck midshipmen. The simulator training substitutes for at sea experience required for deck officer licensing by the U.S. Coast Guard. A series of courses for master mariners was given to prepare them for emergency readiness. Additionally, an extensive set of studies to improve the effectiveness of submarine simulator trainers was performed for the Naval Training Systems Center in Orlando, FL. Follow-on development will provide improved training for submariners.

MARAD also worked with the U.S. Army Corps of Engineers (USACE) on a comparative study of "Ship Simulator Capability and Channel Design." The study reviewed the capabilities of CAORF and two "part task" simulators, the USACE simulator at Vicksburg, MS, and the U.S. Coast Guard simulator in Washington, DC. Application of ship-handling simulation to the channel design process was determined to be a valuable tool.

Advanced Systems and Technology

During the fiscal year, MARAD completed most of the work for the second volume in the navigation/communications study for the Great Lakes and Saint Lawrence River system. This report, *Volume II Requirements Definition Statement*, attempts to quantify ship-maneuvering accuracy requirements in restricted waterways using results from ship simulators. The final report is scheduled to be published in FY 1987.

MARAD continued to participate in the Department of Transportation

Small Business Innovative Research Program by awarding two study contracts in FY 1986. One study involves an instrument to measure the height of overhead obstructions above ships (such as bridges) and the other addresses a non-intrusive ship's shaft torque-measurement system.

MARAD completed work on the WATERCOM inland waterways communications system during the year. This project was identified as a requirement by the participants in the 1972 Domestic Shipping Conference sponsored by MARAD. A contract for a conceptual design was awarded to Waterway Communication Systems, Inc. in 1973 and a cost-shared system development contract was awarded in 1975. Final steps to install a fully commercialized system were taken during FY 1986. All hardware and installation costs for the final system were funded by the private sector.

During the reporting period, MARAD continued support of analyses conducted by the National Academy of Sciences' Marine Board.

The Agency also actively represented the U.S. maritime community in the DOD/DOT Navigation Working Group (responsible for development of the Federal Radio Navigation Plan) subcommittees and ad-hoc panels within the Radio Technical Commission of Maritime Services, and working groups on Safety of Life at Sea, and Navy advisory groups dealing with merchant ship survivability.

Marine Science

The goal of MARAD's Marine Science Program is to improve ship hydrodynamics, structures, and propulsion, and to transfer that technology to the U.S. merchant marine.

Ship maneuvering remained a central concern in FY 1986. A new instrumentation package, the Maritime Coefficient Identification System (MARCIS), has been under development for some time. Following successful prototype tests, MARCIS was undergoing upgrading and completion during the period. The system will enable naval architects to determine

the coefficients of maneuvering response equations directly from ship trials. MARCIS is expected to increase the level of confidence in model test predictions for new design, and provide better insight into design features which improve maneuverability.

MARAD continued its involvement in cooperative ship structural research through the inter-governmental Ship Structure Committee.

Arctic Shipping

Field tests to analyze Arctic shipping conditions and to develop design and operating criteria for ships operating in the Arctic continued in FY 1986.

Coordinated by MARAD and performed on a U.S. Coast Guard Polar Class icebreaker, these tests also were supported by other U.S. Government agencies, the State of Alaska, the Canadian Government,

and private U.S. companies. Ice-impact tests and ship-icing experiments were conducted on the icebreaker POLAR SEA in the south Bering Sea during April 1986. Instruments on the bow and deck of the POLAR STAR measured structural loads imposed by ice during operations in the Beaufort Sea in September 1986. Additional testing was scheduled to continue into October 1986.

Over the past eight years, this program has produced extensive information on ice conditions over potential Arctic tanker routes and their effects on ships' hulls and performance. Many ice ridges have been profiled and ice cores taken in the Beaufort, Chukchi, and Bering Seas. As a result of these tests, year-round operations have been shown to be feasible in the Bering Sea.

Long-range goals of this joint research program include developing

design and operating criteria for ships engaged in the year-round transportation of Alaskan natural resources. Additionally, the program develops environmental, safety, and marine transportation data to enable the Government to make rational decisions concerning expanding Arctic activities.

University Research

MARAD solicits research proposals each year from the U.S. academic community to bring new perspectives to the problems of the maritime industry and to provide new dimensions to its research program.

In FY 1986, projects were undertaken on nonlinear ship motions, antifouling hull coatings, structural details, barge transportation, ship maneuvering, loads on ship structure due to slamming, and liquid sloshing in cargo tanks.

Chapter 7

Maritime Labor and Training

The Maritime Administration (MARAD) supports the training of merchant marine officers and supplemental training related to safety in U.S. waterborne commerce. The Agency also monitors maritime industry labor practices and policies in conjunction with national and international organizations, and promotes consonant labor relations.

U.S. Merchant Marine Academy

The U.S. Merchant Marine Academy at Kings Point, NY, which MARAD operates, trains young men

and women to become officers in the American merchant marine. In addition to classroom training, midshipmen are required to 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. U.S. citizen graduates are obligated to apply for commissions as ensigns in the U.S. Naval Reserve.

The Class of 1986 comprised 114 third mates, 109 third assistant engineers, and 21 graduates who completed the dual deck/engine program. There were 25 women among the graduates. Within 90 days following commencement, approximately 79 percent of the 244 graduates had already found employment in the maritime industry, aboard ship or ashore, or were serving on active duty in the U.S. military service.

Average enrollment at the Academy during the year was 976.

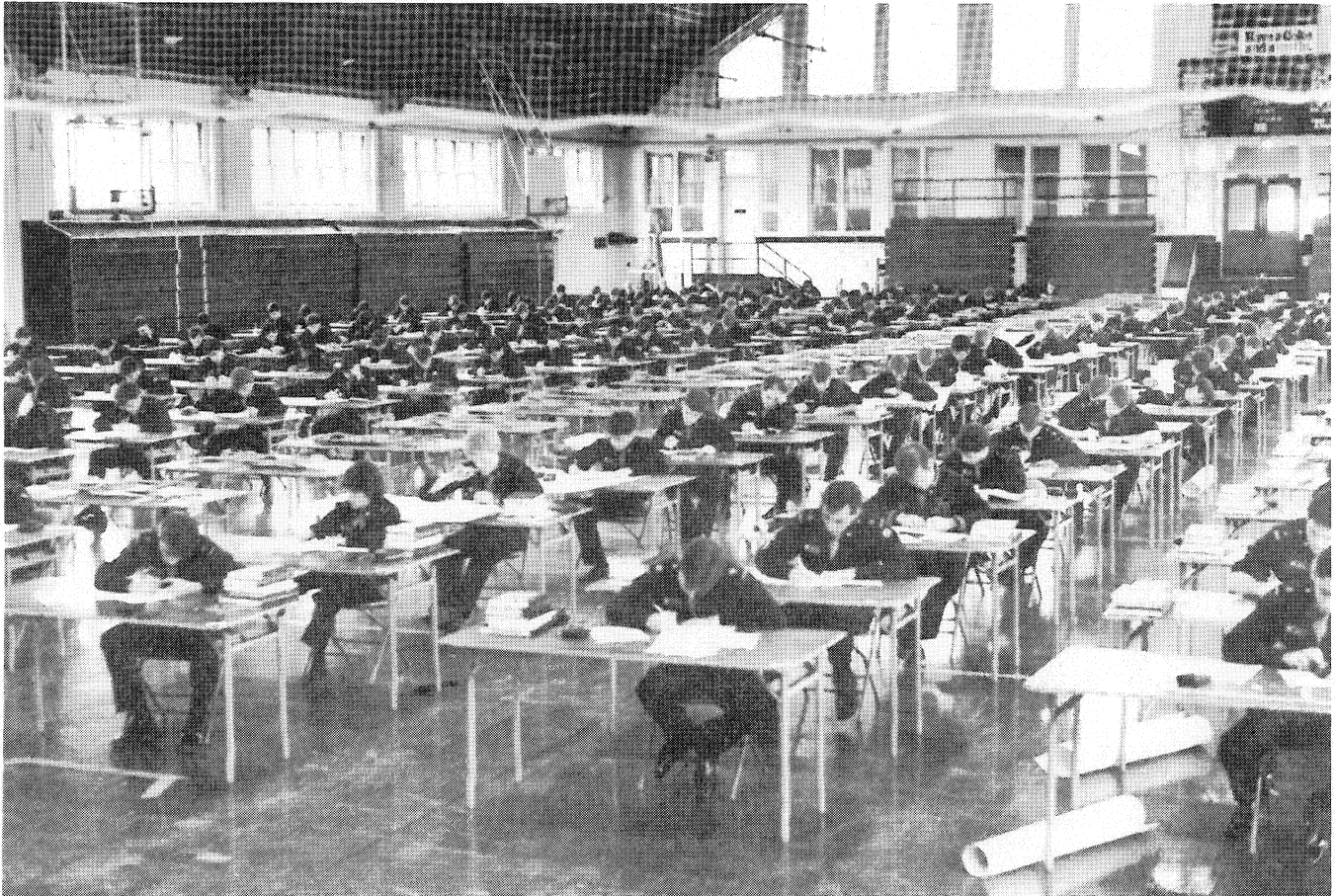
At the beginning of the 1986-87 school year, the regiment of midshipmen included 66 women—15 of whom are scheduled to graduate in June 1987.

Members of Congress nominated 2,018 constituents for the Class of 1990. A total of 271 appointments were made in FY 1986.

All classes of the Academy are now under mandatory service obligation contracts to serve 5 years in the U.S. merchant marine, maintain a Naval Reserve commission for 8 years, and renew the 5-year U.S. Coast Guard license at least once after graduation.

The Academy is accredited by the Middle States Association of Colleges and Schools. The Marine Engineering Systems curriculum is accredited by the Accreditation Board of Engineering and Technology.

In FY 1986, the Academy began a regimental system self-study to examine the regimental program mis-



Members of the U.S. Merchant Marine Academy's class of 1986 take their Coast Guard-administered license examination, which led to their certification as third mates, third assistant engineers, or, for 21 graduates, both.

sion and goals, enforcement of regulations and standards, and the mechanics of implementing the disciplinary system. This type of indepth self-study has not been done since the establishment of the Academy in 1943.

During the reporting period, the Academy also was in the process of developing a five-year Academy master plan. It will contain elements of the existing academic plan and the facilities modernization plan.

The Academy revised the method by which the Academy honor concept is maintained and the way in which the Honor Review Board functions.

State Maritime Academies

MARAD rendered financial assistance to six State maritime academies in accordance with the Maritime Education and Training Act of 1980 (Public Law 96-453). The legislation provides for the training of merchant marine officers to meet national objectives stated in the Merchant Marine Act of 1936, as amended.

The State academies are located at Vallejo, CA, Castine, ME, Buzzards Bay, MA, Traverse City, MI, Fort Schuyler, NY, and Galveston, TX.

Graduates from the six academies in 1986 totaled 687.

In addition to U.S. Coast Guard licenses, graduates of five academies receive Bachelor of Science degrees (associate degrees are awarded by the Great Lakes Maritime Academy in Traverse City, MI) and, if qualified, are commissioned as ensigns in the U.S. Naval Reserve.

After graduation, 57 percent of the graduates found employment in the maritime industry aboard ship or ashore, or were serving on active duty in the Navy or Coast Guard.

Public Law 96-453 provides for a mandatory 3-year service obligation in the U.S. merchant marine for any subsidized student as a condition to receiving annual Federal student incentive payments of \$1,200 each for all graduating classes entering after April 1982.

Under Public Law 96-453 MARAD also provides training vessels to each of the five salt-water academies. During the spring of 1986, Massachusetts Maritime Academy conducted its first training cruise on the T.V. PATRIOT STATE, which was acquired and converted into a training vessel for its use. The Academy's former training vessel, TS BAY STATE, was severely damaged by fire in 1981.

Supplemental Training

MARAD's supplemental training program provides classroom and hands-on instruction dealing with fire fighting, damage control, and diesel engines.

During FY 1986, MARAD trained 1,660 maritime personnel in ship and barge fire fighting. Participants were largely U.S. seafarers, but included others concerned with maritime fire safety such as Coast Guard personnel and port-city professional fire fighters.

MARAD-sponsored basic fire-fighting training is offered at the Agency's fire school at Swanton, OH, the U.S. Navy-Military Sealift Command/MARAD fire training facility in Earle, NJ, and the U.S. Navy fire-training installation, Treasure Island, San Francisco, CA. A fee of \$25 per student training day is charged for MARAD fire-training courses.

MARAD's Fire Training Center in Swanton, OH, expanded its training course to include special instruction for municipal port-city fire personnel from Great Lakes and Tidewater ports. While municipal fire personnel have extensive fire-technology training and experience, the MARAD course acquaints them with vessel lay-out and terminology and fire fighting field exercises in the simulator *M.V. TOLEDO*. The course also was conducted at the Port of Lorain, OH, co-sponsored by U.S. Coast Guard, 9th District. In addition to training programs, fire instructors assisted the City of Winona, MN, in a local study involving the Winona Port City Master Plan.

A draft curriculum outline for MARAD's Advanced Firefighting Program for ships' officers was completed in the last quarter of FY 1986.

In FY 1987, the complete course package will be finalized and distributed to key maritime training schools with the objective of providing ships' officers with the ability to better deal with shipboard fire emergencies.

The Agency's Continuing Education Marine Diesel Program at Kings Point, NY, provided 109 industry personnel with special courses designed with the slow-speed diesel power plant in mind. Slow-speed diesel training is a critical element in MARAD's promotional activities because such engines are replacing the less-efficient steam-propulsion power plants in the U.S.-flag fleet.

In cooperation with the U.S. Navy's Strategic Sealift Division, MARAD awarded Navy-funded contracts to two radio-officer training schools to conduct a radio officers' defense readiness training course. This program will improve communications between U.S. Navy and U.S. merchant marine ships in peacetime and in the event of national emergency. Additionally, 60 shipmasters completed the ongoing "Master Mariners Readiness Training Course," funded by MARAD, and conducted at the U.S. Merchant Marine Academy during FY 1986.

Labor Relations

Longshore

The International Longshoremen's Association contract covering Atlantic and Gulf ports expired September 30, 1986, without agreement on a new contract. Longshoremen in South Atlantic and Gulf ports agreed to begin working October 1, 1986, under new wage terms while continuing to negotiate local port issues.

On the Pacific Coast, the International Longshoremen's and Warehousemen's Union agreement, reached in July 1984, extends to July 1987.

The longshore and clerk shortages at the Ports of Los Angeles and Long Beach the previous year were eliminated as a result of a successful major registration process.

A National Labor Relations Board (NLRB) decision on the ILWU-Pacific

Maritime Association Rules on Containers was issued in January 1986. The U.S. Supreme Court approved the East Coast 50-mile rule as a labor rule during the past year, removing what should be the last barrier to NLRB action on the West Coast rules. The Federal Maritime Commission has yet to complete its parallel consideration of the 50-mile rule in the context of the shipping statutes.

Seafaring

Collective bargaining agreements covering most of the major seafaring unions negotiated in 1984 will not expire until June 1987. However, the Marine Engineers Beneficial Union District 1-Pacific Coast District and its contracted companies negotiated a new contract extending to June 15, 1990. The agreement provided for wage increases of 2 percent in 1987, 1988, and 1989, and for significantly reduced fringe benefit costs. Also, the Marine Engineers Beneficial Association, District 2-Associated Maritime Officers extended their agreement to June 15, 1990, with no major cost increases. Job security remains the major concern due to declining employment opportunities.

Employers and licensed seafaring unions have been successful in stop-

ping the significant escalation of medical costs. The unlicensed-seafarers' health-care costs will have slight increases.

The funding of pension plans also received serious attention. By the end of 1985 the MEBA Pensions Plan was fully funded. The trustees prepared to dedicate more than \$200 million to fund all the liabilities for those who became pensioners through December 1985.

Labor Data

During FY 1986, average monthly U.S. seafaring employment in all sectors (private, Government contract, and Great Lakes) decreased to 16,182, off 9.5 percent from the FY 1985 average of 17,887. (See Table 18.) The total work force in selected U.S. commercial shipyards decreased 4 percent from 103,329 to 99,500, and average longshore employment declined from 29,759 to 28,421, down 4.5 percent.

Merchant Marine Awards

The Merchant Marine Medals Act of 1956 authorizes the Secretary of

Transportation to grant medals and decorations for outstanding and meritorious service or participation in national defense action.

During this reporting period, the Gallant ship award was approved for presentation to the M/V SAN FRANCISCO. The Gallant Ship plaque is awarded to any vessel cited for saving lives or property through outstanding or gallant action in marine disasters or other emergencies.

The SAN FRANCISCO was cited for lifesaving actions while assisting the tanker PUERTO RICAN, which exploded as it was leaving San Francisco Bay in October 1984. A Merchant Marine Meritorious Service Medal was presented to the master of the SAN FRANCISCO and Letters of Commendation were presented to the vessel's crew for rescuing the Third Officer and a San Francisco Bay pilot who were blown overboard when the tanker exploded. In that same action, a Merchant Marine Distinguished Service Medal was awarded to Captain James S. Nolan, the San Francisco Bay pilot who was blown overboard. Captain Nolan, who sustained leg and pelvic fractures and third-degree burns, directed the SAN FRANCISCO to first rescue the ship's Third Officer before attempting his rescue.

Table 18: MARITIME WORKFORCE AVERAGE MONTHLY EMPLOYMENT

	Average Monthly Employment in Fiscal Year:	
	1985	1986
Seafaring Shipboard Jobs:	17,887	16,182
Shipyards¹:	103,329	99,500
Production Workers	81,752	72,866
Management and Clerical	21,577	26,634
Longshore:	29,759	28,421

¹Commercial yards in the Active Shipbuilding Base, constructing new ships and/or seeking new construction orders.

Chapter 8

National Security

The Maritime Administration (MARAD) maintains the National Defense Reserve Fleet (NDRF) as a ready source of vessels for use during national emergencies and assists the U.S. maritime industry in fulfilling its traditional role as the Nation's fourth arm of defense in logistically supporting the military when needed.

Reserve Fleet

The NDRF is an inactive reserve source of ships that would be activated to meet the shipping requirements of the United States during national emergencies. These vessels, which include merchant ships and naval auxiliaries, are available for use in both military and nonmilitary emergencies, such as commercial shipping crises.

On September 30, 1986, the NDRF consisted of 299 ships berthed in three different locations—James River, VA; Beaumont, TX; and Suisun Bay, CA (see Tables 19 and 20). Of these, 255 are in the Fleet Preservation Program, which involves conventional preservation, dehumidification, and cathodic protection.

Ready Reserve Force

The Ready Reserve Force (RRF) is a select component of MARAD's NDRF consisting of vessels which can be activated for sealift operations within 5 to 10 days' notice. Other NDRF vessels require an average of 30 to 60 days for activation.

As of September 30, 1986, the RRF consisted of 77 ships, with a planned expansion to 116 ships.

Pursuant to a 1982 Memorandum of Understanding with the Navy, MARAD, in FY 1986, purchased 13 ships for the RRF: 6 roll-on/roll-off (RO/RO) vessels; 3 SeaBee vessels, each with 24 SeaBee barges; and 4 LASH carriers, each with a full complement of LASH barges. Three of the six RO/RO ships and all three of

the SeaBee vessels with barges were delivered to MARAD prior to the end of the fiscal year. The remaining vessels were undergoing repairs in a U.S. shipyard or repair facility.

Under a MARAD/Navy RRF outporting plan, whereby certain RRF vessels are berthed at or near activation sites and expected load-out ports, the following designations had been made by the end of FY 1986: 21 ships to layberths on the East Coast; 7 ships to layberths on the West Coast; and 3 ships to layberths on the Gulf Coast. It was anticipated that several more ships would be outported during FY 1987.

As part of continuing tests of MARAD's ability to activate RRF vessels, the Chief of Naval Operations ordered the following activations in FY 1986:

- The ADVENTURER was activated from the James River Reserve Fleet as a training exercise;
- The CAPE DUCATO and CAPE BON were activated from a layberth in Baltimore and the Suisun Bay Reserve Fleet, respectively, and participated in cargo-carrying exercises for 139 operating days;
- The CAPE DECISION was activated from a layberth in Baltimore and operated for 179 consecutive days carrying out various missions for the Military Sealift Command;
- The training vessel PATRIOT STATE, normally assigned to the Massachusetts Maritime Academy, and an RRF vessel outported there, were activated for a military exercise.

All activations were successfully performed in five days or less.

During FY 1986, two RRF ships were modified for the underway-replenishment consolidation (UNREP CONSOL) system and modifications were begun on two others. The UNREP CONSOL system, with support equipment, permits underway ship-to-ship transfer of cargo from the RRF ships and other ships. One ship also was being fitted with a vertical replenishment platform to facilitate cargo transfers by helicopters. Other sealift enhancement features being installed on

various RRF ships included vehicle tiedowns, lighter stowage ancillaries, alongside lighter moorings, and nuclear, biological, chemical washdown system clips.

MARAD previously was assigned responsibility by the Chief of Naval Operations, Strategic Sealift Division, for the custody of the USNS WRIGHT, the lead ship of the T-AVB (Aviation Logistic Support Ship) project. The mission of the T-AVB is to provide rapid deployment of aviation maintenance and repair equipment to a theater of operations.

MARAD assigned the USNS WRIGHT to its outport layberth in Philadelphia, PA. The vessel will be maintained in a high state of readiness in support of rapid deployment requirements and augmentation of Maritime Prepositioned Forces.

Also during FY 1986, the RRF auxiliary crane ship KEYSTONE STATE (T-ACS) successfully participated in the joint Armed Services exercise "BOLD EAGLE," at Santa Rosa Island adjacent to Pensacola, FL. During this 47-day exercise, the KEYSTONE STATE transferred over 5,000 tons of military cargo from various types of lighter craft. Upon the return of the KEYSTONE STATE to the training layberth, MARAD provided cargo-handling units of the Army, Navy, and Marine Corps with two weeks of specialized training in the operation of the advanced, automatically controlled cargo-handling crane equipment.

Another T-ACS, the GEM STATE, while temporarily berthed at Portland, OR, was made available for automated crane operator training of West Coast military units during FY 1986. On May 22, 1986, the GEM STATE was shifted to its reassigned layberth in Tacoma, WA, and a successful sea trial was conducted en route. Training of military units at Tacoma is expected to continue.

Ship Design and Engineering

In FY 1986, MARAD substantially completed conversion of the third of 12 planned auxiliary crane ships on behalf of the Navy. The GRAND CANYON STATE (T-ACS), formerly the containership PRESIDENT POLK,

Table 19: NATIONAL DEFENSE RESERVE FLEET—SEPTEMBER 30, 1986

Fleet Sites	Retention ¹	Scrap Candidates	Special Programs	Totals
James River, VA	119	13	7	139
Beaumont, TX	51	2	13	66
Suisun Bay, CA	85	6	3	94
Totals:	255	21	23	299

¹ Vessels maintained for emergency activation under the fleet preservation program, including RRF.

Table 20: NATIONAL DEFENSE RESERVE FLEET, 1945–1986

Fiscal Year	Ships	Fiscal Year	Ships
1945	5	1966	1327
1946	1421	1967	1152
1947	1204	1968	1062
1948	1675	1969	1017
1949	1934	1970	1027
1950	2277	1971	860
1951	1767	1972	673
1952	1853	1973	541
1953	1932	1974	487
1954	2067	1975	419
1955	2068	1976	348
1956	2061	1977	333
1957	1889	1978	306
1958	2074	1979	317
1959	2060	1980	303
1960	2000	1981	317
1961	1923	1982	303
1962	1862	1983	304
1963	1819	1984	386
1964	1739	1985	300
1965	1594	1986	299*

* As of September 30, 1986. Includes 49 vessels which are not merchant ships and/or which are below 1,000 gross tons.

Table 21: MARINE AND WAR-RISK INSURANCE APPROVED IN FY 1986

Kind of Insurance	Total Amount	Percentage	
		American	Foreign
Marine Hull and Machinery	\$ 8,482,727,427	52	48
Marine Protection and Indemnity ¹			
War-Risk Hull and Machinery	6,859,580,049	47	53
War-Risk Protection and Indemnity	6,859,580,049	47	53

¹ Protection and indemnity insurance coverage is obtained principally from assessable mutual associations managed in the British market and is unlimited, thereby making it impossible to arrive at the total amount or percentage figures for American and foreign participation.



Roll-On/Roll-Off (RO/RO) vessels have a high utility as military auxiliaries. The 23,725-deadweight-ton RO/RO CAPE DOMINGO is diesel-powered with a controllable pitch propeller. It was added to the Ready Reserve Force in FY 1986.

was scheduled to be berthed at Portland, OR, upon redelivery. The vessel will be used for instructing West Coast military units in the use of its cargo-handling gear.

A conversion contract for the fourth, fifth, and sixth auxiliary crane ships was awarded to Norfolk Shipbuilding & Drydock Corp., Norfolk, VA, during this reporting period. The scheduled completion dates are November 1987, December 1987, and February 1988.

An Invitation for Bids was issued for the long lead-time procurement of marine deck cranes for the seventh and eighth craneships. The cranes were scheduled to be ordered in the second quarter of FY 1987.

T-ACS are self-sustaining container off-loading vessels. Each is being equipped with pedestal cranes with an outreach capable of unloading gearless containerships moored alongside. They will be utilized in military situations in forward areas where cargo-handling facilities are limited, such as in over-the-beach operations, underdeveloped ports or ports damaged by hostilities. The T-ACS program is one of MARAD's most successful RRF endeavors to date.

Exchanges for Scrap

Pursuant to Section 510(i) of the Merchant Marine Act, 1936, as amended, one cargo vessel was traded in to the Government in return for four obsolete NDRF vessels, all of which have been sold for scrapping.

Ship Sales

During the year, two Government-owned vessels were offered for sale for scrap or nontransportation purposes. No offers were received for either vessel.

From 1958 through 1984, a total of 2,318 vessels were sold for scrap or nontransportation uses for a total return to the Government of \$202.9 million.

Pursuant to Public Law 99-307, MARAD authorized the resale for foreign scrapping of three refrigerated vessels—PICTOR, PROCYON, and ZELIMA—which were

previously sold for conversion for operation in the fisheries of the United States. MARAD was reimbursed \$22,107.77, representing one-half of the profits realized from the resale.

Donation for Museum Project

During FY 1986, MARAD accepted the offer of Project Liberty Ship, a nonprofit New York corporation, to assume title to the Liberty ship, JOHN W. BROWN, located in the James River Reserve Fleet, for transformation into a merchant marine memorial museum in the Port of New York/New Jersey. The action involves no additional expense to the Government and was taken pursuant to the provisions of Public Law 98-133.

Fish-Reef Program

A request was received during FY 1986 from the State of North Carolina for the transfer of the ex-USS AEOLUS (located in the James River Fleet), pursuant to Public Law 92-402, as amended by Public Law 98-623, for sinking offshore as an artificial reef. At the end of the reporting period, five other states were waiting to receive additional vessels as they became available for the fish-reef program.

War-Risk Insurance

MARAD administers the war-risk insurance program in accordance with Title XII of the Merchant Marine Act, 1936, as amended. The program insures operators and seamen against losses resulting from war or war-like actions to assure the continued flow of U.S. foreign commerce during periods when commercial insurance is not available on reasonable terms and conditions.

Statutory authority for the program, which had lapsed on September 30, 1984, was reinstated on July 3, 1985, under Public Law 99-59. The law was implemented when regulations revising Title 46 *Code of Federal Regulations* (CFR) Part 308, were published in the *Federal Register* as a final rule on

December 9, 1985. The regulations reflect editorial changes compatible with the new statutory authority as well as requirements contained in the Paperwork Reduction Act as administered by the Office of Management and Budget (OMB).

MARAD has consolidated seven forms previously required under the program into two, an *Application For War Risk Insurance* and the *Interim Binder of Insurance*. These consolidated forms permit applications to be submitted covering a group of vessels, rather than the single vessel application previously required for all vessels except barges. The action significantly reduced the reporting burden on the public and facilitated MARAD's record maintenance.

As of September 30, 1986, there were 959 binders outstanding under the war-risk insurance program, including 352 for war-risk hull and machinery insurance, 351 for war-risk protection and indemnity insurance, and 256 for second seamen's war-risk insurance. These binders will be effective for 30 days following any automatic termination of commercial insurance.

There were no outstanding binders or policies related to MARAD's standby war-risk cargo insurance and builder's risk insurance programs. However, 26 commercial underwriting agents were under standby contracts for the war-risk cargo insurance program. From the start of the binder program in 1952 through September 30, 1986, binder fees totalled \$1.46 million, while program expenses totalled \$2.59 million. Income from war-risk builder's insurance totalled \$3.5 million and investment income as provided for in Section 1208(a) of the Act amounted to \$9.9 million. On September 30, 1986, assets of the war-risk revolving fund totalled \$16.3 million.

Marine Insurance

MARAD continued to act as the claim agent for Government-owned vessels during FY 1986. On September 30, 1986, there were 22 protection and indemnity claims outstanding, 9 of which were in litigation. Total settlement value of all cases was estimated to be \$600,000.

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

Table 21 shows marine and war-risk insurance approved in FY 1986.

Emergency Operations

Continuing Iranian and Iraqi attacks on merchant shipping in the Persian Gulf were the major warlike problems for the world shipping community during the year. U.S.-flag merchant ships generally did not enter the Gulf, but U.S. ship owners and operators were informed of developments and of arrangements for coordinating shipping operations in the region through special warnings to mariners and MARAD advisories.

The number of militarily useful general cargo ships in the American fleet continued to decline during FY 1986. The parallel decline in European merchant fleets continued and in some cases accelerated.

During the reporting period, plans were made to follow-up the 1985 simulated activation of the entire Ready Reserve Force. MARAD's Eastern, Central, and Western regions; the Reserve Fleets in James River, VA, Beaumont, TX, and Suisun Bay, CA; general agents and layberth operators and supporting organizations such as the Coast Guard, Federal Communications Center, and American Bureau of Shipping, were to be included in the test of MARAD's capability to activate the RRF in an emergency. An important task planned for the exercise, scheduled for October 1986, was a survey of shipyards identified in MARAD's RRF activation plan to verify the state of readiness of shipyard facilities.

Emergency Port Operations

During FY 1986, MARAD carried out the following preparations for the operation of ports during national security emergencies.

Completed Projects	Description
Federal Port Controller Contracts	Executed Federal Port Controller contracts which brought to 39 the ports engaged in the program.
Ports in National Defense Seminar	Participated with the American Association of Port Authorities in conducting a seminar on the role of U.S. ports in national defense activities.
Title 46 CFR Part 340	Initiated an educational program with industry and Federal agencies on the responsibilities of MARAD in issuing planning orders as authorized under Title 46 CFR Part 340. Planning orders are documents that indicate which U.S. port facilities will probably be needed during an emergency period.
CORE Team	Represented the Agency as a member of the Military Traffic Management Command's national Contingency Response (CORE) team, to promote military mobilization and defense preparedness planning.
National Port Readiness	Participated in National Port Readiness Steering Group meeting activities with representatives of the Military Traffic Management Command, the Military Sealift Command, the U.S. Coast Guard, the U.S. Army Corps of Engineers, and the Naval Control of Shipping Organization on the Interagency Memorandum of Understanding on Port Readiness.
Ongoing Projects	Description
Federal Port Controller Contracts	Identified and began negotiations involving all U.S. ports expected to be under Federal Port Controller (FPC) contracts. By the end of FY 1987 over 50 ports are expected to have contracted to serve as agents for the Federal Government in the event a declared emergency would require a Federal Port Network.
Training	Continued preparation and revision of the <i>Port Emergency Operations Handbook for Federal Port Controllers</i> , to be released in FY 1987. Also made preparations to create an automated model for the organization of lines of command and authority for individual FPCs.

International Activities

In FY 1986 MARAD continued its commitment to ensure that American maritime interests are provided an equitable opportunity to participate in world trade. The Agency participated in bilateral discussions with Brazil, China, Korea, the Soviet Union, Taiwan, and Iceland, as well as several multilateral conferences.

Maritime Discussions with Brazil

During FY 1986, the Maritime Administrator led a U.S. interagency delegation in two rounds of meetings with the Government of Brazil concerning the bilateral maritime relationship, with particular emphasis on the U.S./Brazil Equal Access Agreement. The agreement was modified and extended to December 31, 1989.

Maritime Negotiations with the Soviet Union

In March 1986, the Maritime Administrator headed an interagency delegation to the Soviet Union to hold negotiations on a maritime agreement. The negotiations, a continuation of discussions begun in 1985, dealt with cargo and port access and other bilateral issues.

Maritime Consultations with China

In January 1986, agency officials participated in maritime consultations with Chinese officials in Washington, DC. China's restrictions on U.S. carriers' operations in the bilateral trade, including port and cargo access, were raised, but not resolved, during these talks.

Maritime Discussions with Iceland

MARAD was part of an interagency team which assisted in talks held with the Icelandic Government concerning the shipment of military cargoes in the bilateral trade. The talks resulted in a bilateral treaty signed by the United States on September 24, 1986, and later ratified by the U.S. Senate.

Maritime Negotiations with Taiwan and Korea

MARAD officials participated in interagency trade negotiations with Taiwan and Korea. The issue of U.S. carriers' intermodal shipping problems in Taiwan was raised as part of U.S./Taiwan trade negotiations on the Generalized System of Preferences. Korean restrictions on U.S. carriers' operations were underscored by the United States in the Joint Economic Consultations trade subgroup. Among other points of concern raised by the United States were a short-fall of foreign military cargo transported on U.S.-flag vessels and restrictions on U.S. carriers' ability to operate their own trucking and agency operations in Korea.

Consultative Shipping Group

In April 1986, a MARAD representative served as a member of the U.S. delegation which met with the Consultative Shipping Group (CSG), in Copenhagen. The CSG consists of government representatives of the principal European maritime nations and Japan. The meeting resulted in a joint statement reflecting the governments' maritime policies as they relate to the preservation of free access to international ocean cargo and resistance to protectionism in international ocean shipping.

Other International Conferences

The Maritime Administration is active in NATO's Planning Board for Ocean Shipping (PBOS) and its various subgroups, with the Administrator co-chairing the PBOS plenary held September 30 to October 3, 1986, in Washington, DC. During the year, agency personnel participated in other meetings of PBOS and its subgroups in Europe.

MARAD also took part in the United Nations Conference of Plenipotentiaries on a Convention on Conditions for Registration of Ships, held in Geneva, Switzerland. The Conference adopted an international agreement concerning the conditions upon which nations may accept vessels on their national registries.

Additionally, MARAD was part of the U.S. delegation to the regularly scheduled meetings of the Maritime Transport Committee (and its subordinate bodies) of the Organization for Economic Cooperation and Development (OECD) in Paris. The meetings pursued two principal themes in FY 1986: coordination of developed country positions for meetings within UNCTAD and development of a common statement of OECD members' shipping policy vis-a-vis non-members (developing countries and state trading countries), as well as reevaluation and restatement of intra-OECD shipping policy.

During FY 1986, MARAD was active in the President's Caribbean Basin Initiative Program (CBI). One of the goals of the CBI is to alleviate transportation impediments to trade and development in that area. To this end, a MARAD representative chaired a joint interagency-private sector task group to evaluate the needs of the Caribbean Basin in the area of transportation training. The Maritime Administration also conducted the Seventh Port Safety and Security Seminar for the Organization of American States in Kingston, Jamaica. Cargo security and maritime terrorism were topics of presentations to representatives of the Caribbean countries in attendance.

Chapter 10

Administration

The administrative actions taken in support of the mission and programs of the Maritime Administration (MARAD) in FY 1986 are summarized below.

Maritime Subsidy Board

The Maritime Subsidy Board (MSB), by delegation from the Secretary of Transportation, principally 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. MSB decisions, opinions, orders, rulings, and reports are final unless the Secretary of Transportation undertakes reviews of these actions.

The MSB is composed of the Maritime Administrator, who acts as Chairman of the Board, the Deputy Administrator, and the Agency's Chief Counsel. The Secretary of MARAD and of the MSB acts as an alternate member in the absence of any one of the three permanent Board members.

The MSB met 30 times in FY 1986. It considered and acted on 77 items and issued 7 formal opinions, rulings, and orders. MARAD also published 43 notices in the *Federal Register* relating to required statutory hearings and to the development and adoption of rules and regulations in the implementation of the Merchant Marine Act, 1936, as amended. The Secretary of MARAD, as Freedom of Information Officer, received and processed 311 Freedom of Information Act requests.

During FY 1986, the MSB took several actions to strengthen the U.S. Merchant Marine. In the area of operating flexibility, on February 28, 1986, it issued a final opinion and order allowing subsidized operators of bulk cargo vessels to compete for the carriage of preference cargo on a non-subsidized basis.

On January 31, 1986, the MSB approved in part, and subject to certain conditions, United States Lines, Inc.'s application for permission to conduct non-subsidized operations with its Jumbo Econships and other supporting vessels, in a round-the-world service.

On July 2, 1986, the MSB made the required findings under Section 605(c) of the Merchant Marine Act, 1936, as amended, prerequisite to further consideration of the application of Lykes Bros. Steamship Co., Inc. to expand its operations onto Trade Routes 10 and 18. The MSB's findings culminated a lengthy hearing process in which Lykes' application had been opposed by other U.S.-flag liner operators.

On June 3, 1986, the MSB approved the total repayment of construction-differential subsidy on the tanker BROOKLYN. In exchange for domestic trading rights, the Government received approximately \$19 million.

Legal Services, Legislation, and Litigation

MARAD's Office of Chief Counsel provides legal support and assistance to the procurement, personnel, and public information activities conducted by MARAD headquarters, the regional offices and the U.S. Merchant Marine Academy. Specialized legal services are made available to other Federal and State agencies for the acquisition and conversion of commercial vessels. Litigation support is provided to the Department of Justice on all court cases involving MARAD.

FY 1986 was an unusually active period for legislation and litigation involving the cargo preference and Title XI programs.

Activity involving cargo preference resulted in a district court decision holding that the 1954 Cargo Preference Act applies to the Agriculture Department's blended-credit program. Subsequently, a legislative compromise was enacted which substantially restructured the application of cargo preference to agriculture programs. Briefly, U.S. agricultural products made available

at prevailing world prices, with blended credit guarantees or under a barter arrangement, were exempted from cargo preference. However, for the remaining agricultural assistance programs, the required percentage of U.S.-flag carriage of such cargoes increases from a 50 to 60 percent share in 1986, to 70 percent in 1987, and to 75 percent in 1988.

In another cargo preference development, a bilateral treaty with Iceland was executed governing the carriage of military cargoes.

A legislative proposal to improve MARAD's ability to recover Title XI assets in default received attention in the Congress.

Administrative claims and court actions against the Agency relating to occupational exposure to asbestos continued. Included were approximately 9,000 administrative claims under the Federal Tort Claims Act and the Suits in Admiralty Act, and 4,000 lawsuits.

MARAD rulemaking initiatives focused on simplifying existing program regulations and reassessing restrictions affecting U.S.-flag operations.

Management Initiatives

To facilitate and expedite administration of the Operating-Differential Subsidy (ODS) program, certain routine functions were transferred during FY 1986 from the Maritime Subsidy Board to the Maritime Administrator.

MARAD issued a Maritime Administration Acquisition Procedures Manual prescribing uniform standards and procedures for the acquisition of personal property, nonpersonal services and construction. The manual also delegates specific authorities and assigns certain responsibilities for acquisition-related functions.

Audits

During FY 1986, DOT's Office of the Inspector General (OIG) submitted the following final internal audit reports to MARAD: "Audit of the Federal Ship Financing Guarantee Program," "Survey of Ready Reserve

Fleet Management" and "Audit of Merchant Marine Training at State Maritime Academies." The Agency generally agreed with the findings contained in the reports, except for the audit of the Ship Financing Guarantee Program. MARAD and the OIG are working to resolve the issues addressed in this audit.

The General Accounting Office did not issue any reports to the Secretary of Transportation on MARAD programs or activities during FY 1986.

Information Management

The use of information resources management technology expanded significantly in FY 1986. To meet the Agency's widening needs for information and provide more technological support, the number of microcomputer terminals in the office-automation system was increased. Every program and administrative office now has at least one microcomputer workstation. System capability was expanded by the interconnection of office terminals to form a local area network. The use of the mini-computer installed in the Operations Center was also expanded.

Efforts to improve the timeliness and usefulness of maritime statistical information included accelerating the development of new ways of processing waterborne trade data. Support of the Agency's many national defense projects also was increased. The Agency's new strategic Information Resources Management plan improved MARAD's ability to commit information management and automation resources and produce special reports used by the Department of Transportation and other Executive Branch agencies.

Personnel

The Maritime Administration employment totaled 1,047 at the end of FY 1986. The percentage of MARAD's female and minority employees and their representation in supervisory positions remained relatively stable during the period, as did the percentage of handicapped employees.

Four upward mobility positions were established during FY 1986.

Twenty-two MARAD employees received high honors in FY 1986. Four Silver Medals, Thirteen Bronze Medals, and Five Secretary's Awards for Excellence were approved. Performance awards went to 105 Agency employees—38 quality step increases and 67 special achievement awards.

Safety Program

Asbestos Control

During FY 1986, MARAD continued its Action Plan for the Control of Asbestos Exposures and Uses in MARAD Programs. Agency policy is to prevent or stringently limit personnel exposure to airborne asbestos fibers.

The Action Plan seeks to eliminate asbestos materials from MARAD programs, repair or replace asbestos materials already installed, modify work procedures, and provide employee training.

MARAD's Asbestos Medical Surveillance Program provides preplacement, fit-for-duty determinations, and pre-separation examinations in addition to periodic medical examinations to designated MARAD employees exposed or potentially exposed to hazardous substances or conditions. Employees assigned to MARAD Headquarters, the Beaumont, James River and Suisun Bay National Defense Reserve Fleets (NDRF), and the Eastern, Central, and Western Region offices, were provided medical examinations.

In conjunction with the Medical Surveillance Program, the Agency also provides NDRF sites and the U.S. Merchant Marine Academy with industrial hygiene services to conduct periodic surveys of the facilities and to target all safety and health hazards.

MARAD gives an "Asbestos Safety Course" to employees assigned to NDRF sites and the U.S. Merchant Marine Academy to train workers and supervisors to recognize potentially dangerous asbestos hazards. The course emphasizes correct work practices and outlines protective measures to prevent exposure to and release of asbestos. Employees also learn to protect themselves from poisonous fumes.

The Agency also conducts safety and health inspections of its work sites.

Installations and Logistics

Real Property

At the end of FY 1986, the Maritime Administration's real property included National Defense Reserve Fleet sites at Suisun Bay, CA, Beaumont, TX, and James River, VA; a warehouse at Kearny, NJ; the U.S. Merchant Marine Academy at Kings Point, NY; and the Wilmington, NC, Maritime Facility.

Facilities for training maritime firefighters were operated at Earle, NJ, and Treasure Island, CA, under MARAD agreements with the U.S. Navy; by Delgado College at New Orleans, LA; and by MARAD at Toledo, OH.

Regional offices were maintained in New York, NY, New Orleans, LA, Chicago, IL, and San Francisco, CA. Maritime Development Offices were maintained in Long Beach, CA, Cleveland, OH, Seattle, WA, Houston, TX, Portland, OR, and the four regional headquarters.

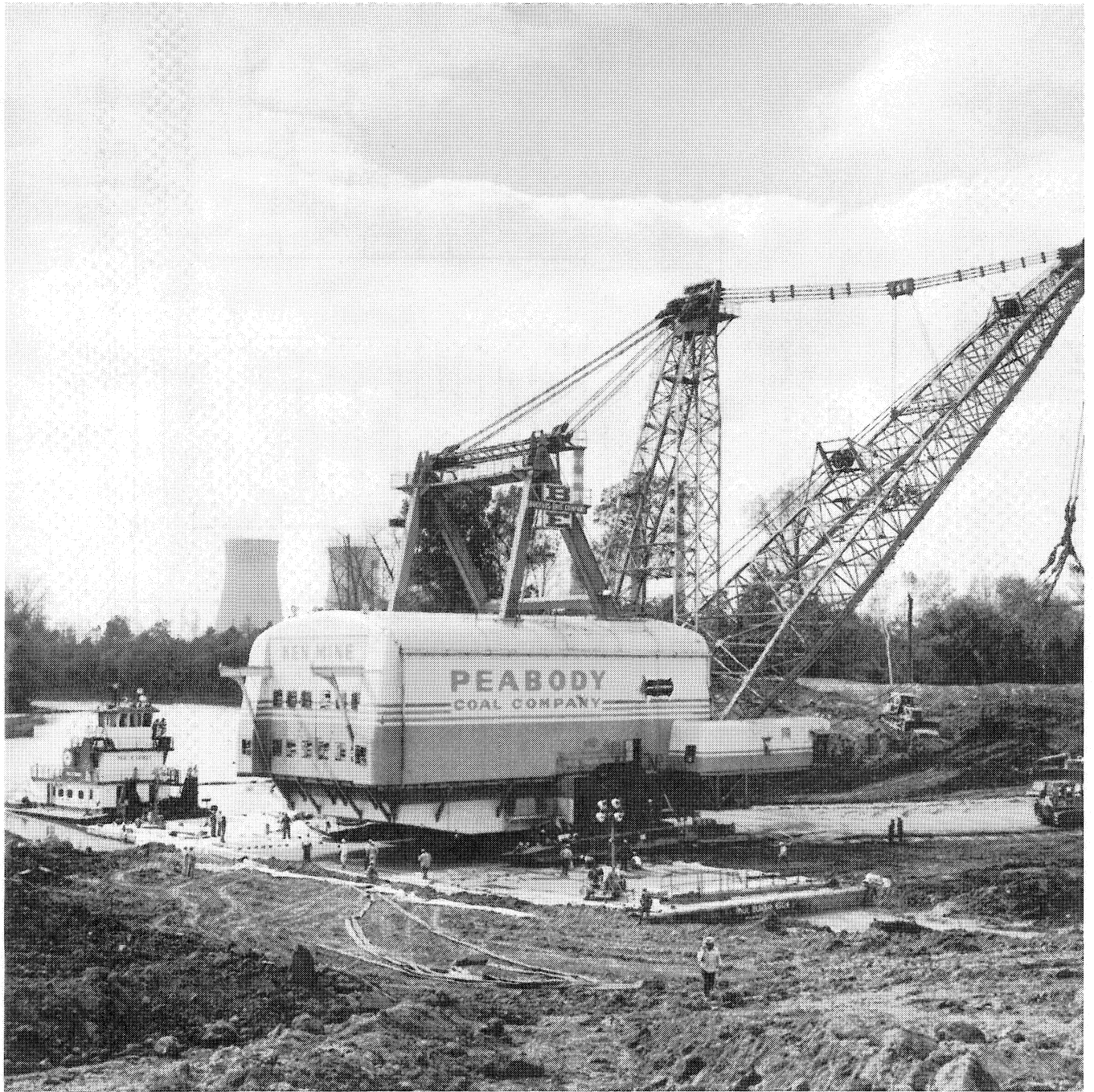
The Agency also maintained the National Maritime Research Center at Kings Point, NY, and Ship Management Offices in Norfolk, VA, Cleveland, OH, Port Arthur, TX, and, New York, NY.

Accounting

MARAD's accounts are maintained on an accrual basis in conformity with generally accepted accounting principles and standards, and related requirements prescribed by the Comptroller General.

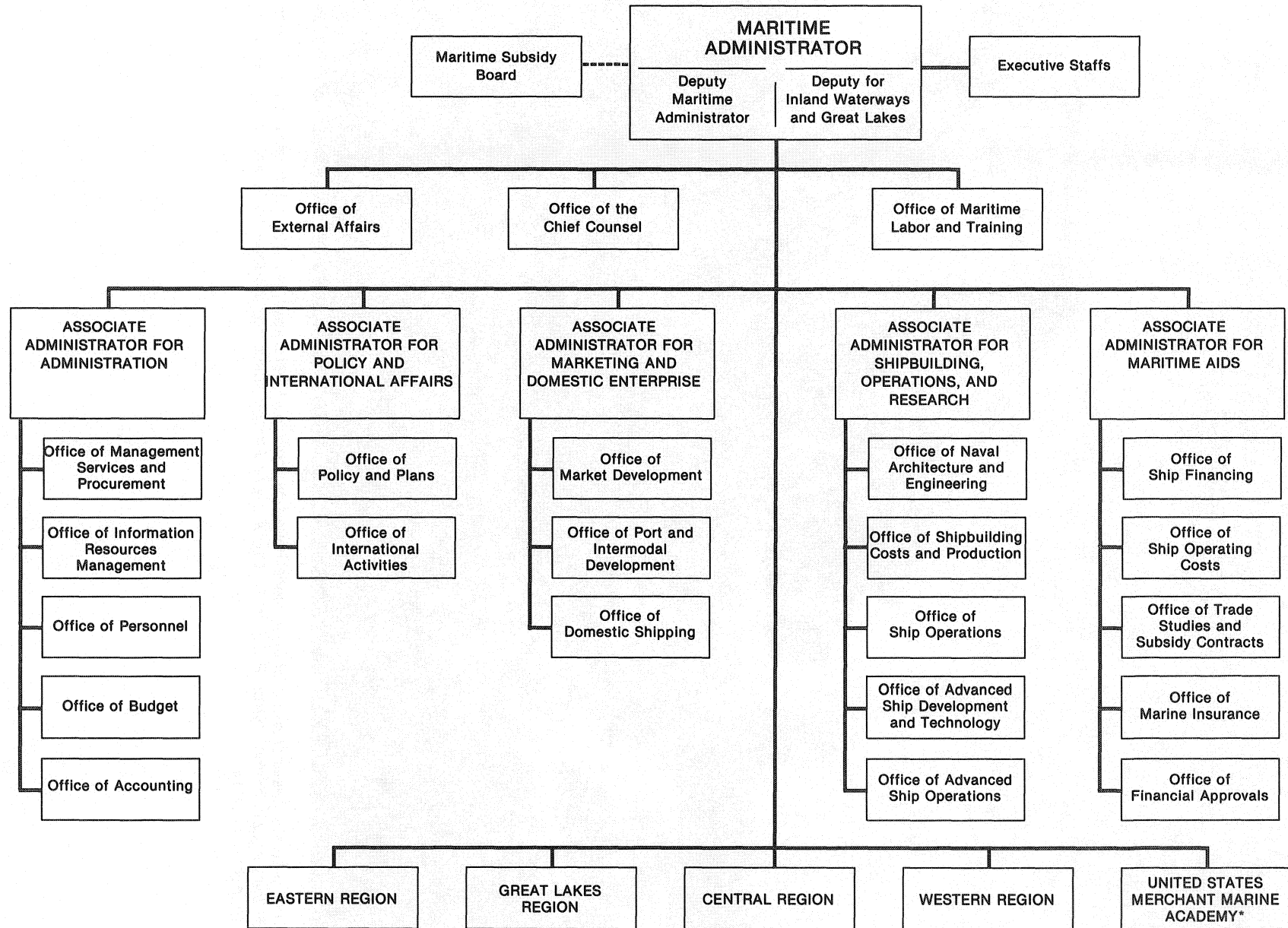
The cost of the Agency's combined operations for the year totaled \$1,015,500,000. This included \$309.4 million in operating-differential subsidies and construction-differential subsidies, \$31.4 million for administrative expenses, \$4.0 million for research and development, \$11.3 million for maintenance and preservation of reserve fleet vessels, and \$8.4 million for financial assistance to State maritime academies.

MARAD incurred \$651 million in other operating expenses, net of income. Financial statements of the Agency appear as Exhibits 1 and 2.



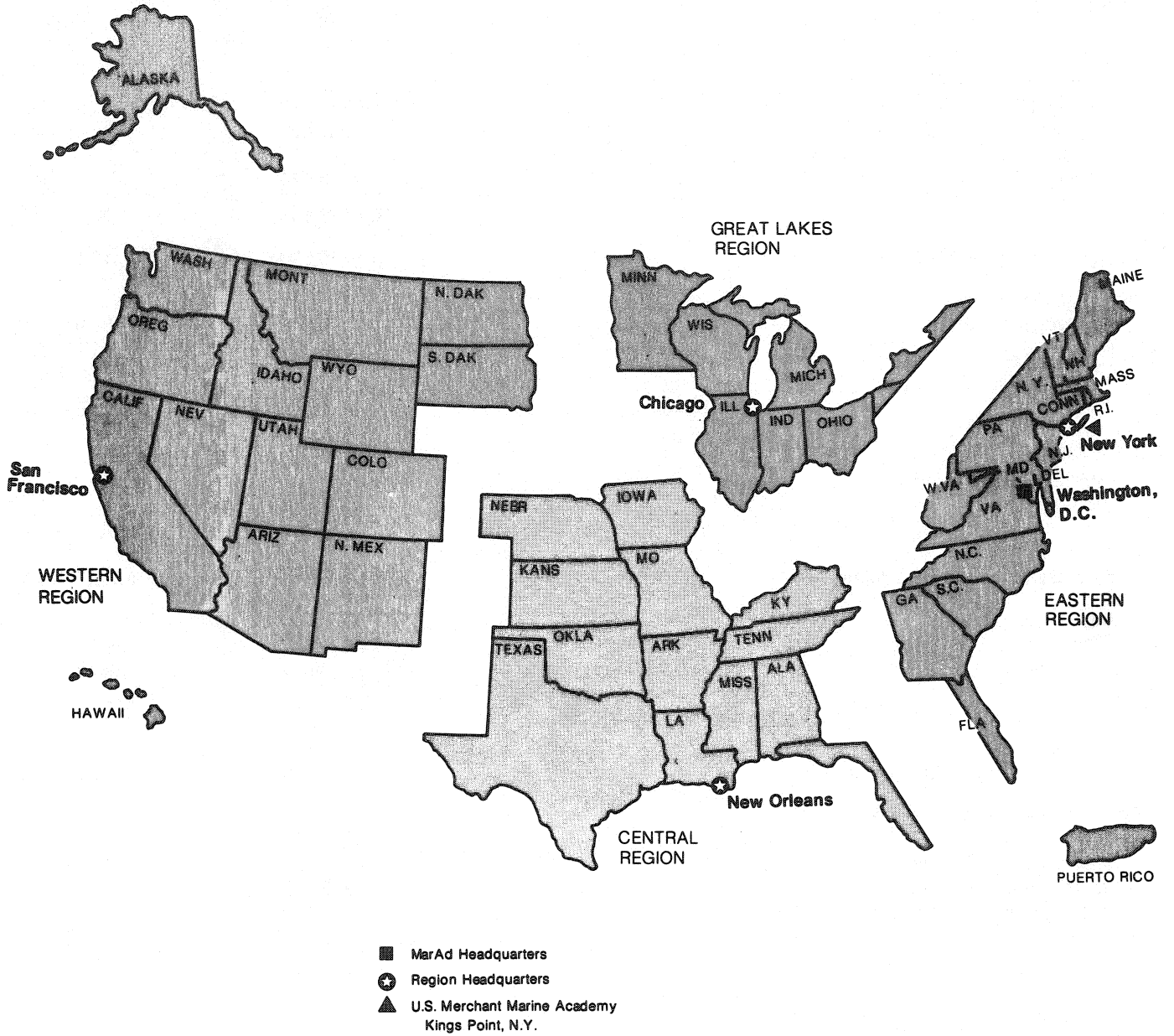
Believed to be the heaviest piece of equipment moved on the inland waterways, a 3,000-ton dragline crane is loaded aboard the heavy-duty deck barge PAUL BUNYON. A second barge supported the lowered boom, and two others were used to increase stability.

MARITIME ADMINISTRATION



* Kings Point, N.Y.

Maritime Administration Organization Chart



FINANCIAL STATEMENTS

U.S. Department of Transportation—Maritime Administration

Exhibit 1. Statement of Financial Condition

September 30, 1985, and September 30, 1986

ASSETS	September 30	
	1986	1985
Selected Current Assets		
Funded Balances with Treasury:		
Budget Funds	\$267,939,778	\$130,105,368
Deposit Funds	562,809	553,464
Allocations from Other Agencies	—	—
Budget Clearing Accounts	— 3,979	— 5,044
	<u>268,498,608</u>	<u>130,653,788</u>
Federal Security Holdings	13,765,000	13,210,000
Accounts Receivable:		
Government Agencies	115,794,272	55,917,321
The Public	12,519,195	14,773,031
Allowances (—)	— 6,371,866	— 13,024,911
	<u>121,941,601</u>	<u>57,665,441</u>
Advances To:		
Government Agencies	—	—
The Public	199,746	187,697
	<u>199,746</u>	<u>187,697</u>
Total Selected Current Assets	\$404,404,955	\$201,716,926
Loans Receivable:		
Repayment in Dollars	1,474,816,847	597,270,558
Allowances (—)	— 1,060,951,674	— 380,225,607
	<u>413,865,173</u>	<u>217,044,951</u>
Inventories:		
Raw Materials and Supplies	4,519,188	4,519,188
Real Property and Equipment:		
Land	7,049,931	6,720,014
Structures and Facilities	100,637,463	43,882,590
Equipment and Vessels	1,554,296,128	1,301,591,415
Leasehold Improvements	92,119	92,119
Allowances (—)	— 1,238,950,752	— 1,222,637,644
	<u>423,124,889</u>	<u>129,648,494</u>
Other Assets:		
Works-in-Process—Other	18,969,472	18,969,472
Material and Supplies	3,440,185	3,440,188
Non-Current Assets	9,116,679	14,052,618
Notes Receivable	21,025,498	26,583,262
Allowances (—)	— 728,667	— 3,781,282
	<u>51,823,167</u>	<u>59,264,258</u>
Total Assets	<u>\$1,297,737,372</u>	<u>\$612,193,817</u>

The Notes to Financial Statements are an integral part of this statement.

FINANCIAL STATEMENTS

U.S. Department of Transportation—Maritime Administration

LIABILITIES	September 30	
	1986	1985
Selected Current Liabilities (Note 2)		
Accounts Payable (Including Funded Accrued Liabilities):		
Government Agencies	\$ 10,443,317	\$ 11,546,126
The Public	110,932,902	19,810,768
	<u>121,376,219</u>	<u>31,356,894</u>
Advances Form:		
Government Agencies	—	—
The Public	—	—
	<u>—</u>	<u>—</u>
	—	—
Total Selected Current Liabilities	\$121,376,219	\$ 31,356,894
Deposit Fund Liabilities	562,809	553,464
Unfunded Liabilities:		
Accrued Annual Leave	6,083,481	2,917,726
Debt issued under borrowing		
Authority: Borrowing from Treasury	1,375,000,000	130,000,000
Other Liabilities:		
Vessel Trade-In Allowance and Other Accrued Liabilities	1,062,513	41,741,990
Total Liabilities	\$1,504,085,022	\$206,570,074
Government Equity		
Unexpended Budget Authority:		
Unobligated	93,305,883	56,113,532
Undelivered Orders	262,279,818	144,610,524
	<u>355,585,701</u>	<u>200,724,056</u>
Unfinanced Budget Authority (—):		
Unfilled Customer Orders	— 73,120,102	— 30,917,488
Contract Authority	—	—
	<u>— 73,120,102</u>	<u>30,917,488</u>
Invested Capital	— 488,813,249	235,817,175
Total Government Equity	\$ — 206,347,650	\$405,623,743
Total Liabilities and Government Equity	<u>\$1,297,737,372</u>	<u>\$612,193,817</u>

The Notes to Financial Statements are an integral part of this statement.

FINANCIAL STATEMENTS

U.S. Department of Transportation—Maritime Administration

Exhibit 2. Statement of Operations

For Years Ended September 30, 1985, and September 30, 1986

	Years Ended September 30	
	1986	1985
OPERATIONS OF THE MARITIME ADMINISTRATION:		
Net Costs of Operating Activities		
Reserve Fleet Programs:		
Maintenance and Preservation	\$ 11,261,022	\$ 14,086,238
Direct Subsidies and National Defense Costs:		
Operating-Differential	308,672,217	338,057,207
Construction-Differential	707,593	4,427,509
	<u>309,379,810</u>	<u>342,484,716</u>
Administrative	31,304,227	38,747,528
Research and Development	3,993,357	9,671,947
Financial Assistance to State Marine Schools	8,363,000	21,076,970
	<u>43,660,584</u>	<u>69,496,445</u>
Other Operating Income Net of Expenses	<u>26,250,653</u>	111,350,606
Net Cost of Maritime Administration	<u>\$390,552,069</u>	<u>\$537,418,005</u>
OPERATIONS OF REVOLVING FUNDS (- Income):		
Vessel Operations Revolving Fund	\$ - 128,757,524	\$ - 94,398,076
War-Risk Revolving Fund	- 1,224,090	- 1,277,780
Federal Ship Financing Fund	754,963,674	250,826,636
	<u>624,982,060</u>	<u>155,150,780</u>
Net Cost of Combined Operations	<u>\$1,015,534,129</u>	<u>\$692,568,785</u>

The Notes to Financial Statements are an integral part of this statement.

U.S. Department of Transportation—Maritime Administration

Notes to Financial Statements—September 30, 1986, and September 30, 1985

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.

2. The Maritime Administration was contingently liable under agreements guaranteeing obligations or insuring mortgages and construction loans payable to holders or lenders totaling \$4,995,351,554 on September 30, 1986, and \$6,491,337,300 on September 30, 1985. Commitments to guarantee additional obligations amounted to \$34,972,000 on September 30, 1986, and \$90,175,000 on September 30, 1985. U.S. Government securities

and cash of \$10,111,602 on September 30, 1986, and \$21,976,638 on September 30, 1985, were held in escrow by the Government in connection with the guarantee of obligations or the insurance of loans and mortgages which were financed by the sale of bonds in the securities market. There were no conditional liabilities for prelaunching War-Risk Builder's Insurance on September 30, 1986.

3. On September 30, 1986, the U.S. Government securities which had been accepted from vessel owners, charterers, subsidized operators, and other contractors as collateral for their performance under contracts amounted to \$180,000.

4. As of September 30, 1986, \$1,474,816,847 of mortgage loans in

default and Federal Ship Financing Fund notes receivable were recorded on the books of account against which an allowance for losses of \$1,066,917,519 was established. Based on information available in January 1987, we estimate that \$600,000,000 in guaranteed loan defaults will be incurred during the fiscal year ending September 30, 1987.

5. As directed by memorandum from OMB, August 21, 1986, the Maritime Administration has established a contingent liability (grossed up) for the Operating-Differential Subsidy Program in the amount of \$2,901,296,000. This amount reflects total estimated out-year liabilities associated with long-term ODS contracts.

Appendix I: MARITIME SUBSIDY OUTLAYS—1936–1986

Fiscal Year	CDS	Reconstruction CDS	Total CDS	ODS	Total ODS & CDS
1936–1955	\$ 248,320,942	\$ 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	235,666,830	377,365,310
1973	168,183,937	17,384,604	185,568,541	226,710,926	412,279,467
1974	185,060,501	13,844,951	198,905,452	257,919,080	456,824,532
1975	237,895,092	1,900,571	239,795,663	243,152,340	482,948,003
1976 ²	233,826,424	9,886,024	243,712,448	386,433,994	630,146,442
1977	203,479,571	15,052,072	218,531,643	343,875,521	562,407,164
1978	148,690,842	7,318,705	156,009,547	303,193,575	459,203,122
1979	198,518,437	2,258,492	200,776,929	300,521,683	501,298,612
1980	262,727,122	2,352,744	265,079,866	341,368,236	606,448,102
1981	196,446,214	11,666,978	208,113,192	334,853,670	542,966,862
1982	140,774,519	43,710,698	184,485,217	400,689,713	585,174,930
1983	76,991,138	7,519,881	84,511,019	368,194,331	452,705,350
1984	13,694,523	–0–	13,694,523	384,259,674	397,954,197
1985	4,692,013	–0–	4,692,013	351,730,642	356,422,655
1986	– 416,673	–0–	– 416,673	287,760,540	287,343,867
Total	\$3,567,991,055	\$264,904,682	\$3,832,895,737	\$7,951,510,422	\$11,784,406,159

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 COMPANIES WITH OPERATING-DIFFERENTIAL SUBSIDY CONTRACTS*

Statement A—Combined Condensed Balance Sheets as of December 31, 1985 and 1984 (Amounts Stated in Thousands of Dollars)

ASSETS	1985	1984
Current Assets:		
Cash	\$ 45,594	\$ 48,870
Marketable Securities	50,697	120,606
Accounts Receivable	418,784	450,912
Other Current Assets	149,357	36,056
Total Current Assets	\$ 664,432	\$ 656,444
Restricted Funds	187,224	261,264
Investments	11,115	33,158
Property and Equipment (Net of Depreciation)	2,376,073	2,142,659
Other Assets	206,175	129,798
TOTAL ASSETS	\$3,445,019	\$3,223,323
LIABILITIES AND STOCKHOLDERS' EQUITY		
Liabilities:		
Current Liabilities — :		
Notes Payable	\$ 190,782	\$ 156,124
Accounts Payable	144,605	167,638
Other Current Liabilities	379,443	401,764
Total Current Liabilities	714,830	725,526
Long-Term Debt	1,668,979	1,321,958
Other Liabilities	307,935	340,650
Deferred Credits	81,617	56,285
Total Liabilities	\$2,773,361	\$2,444,419
Stockholders' Equity:		
Invested Capital	256,331	262,250
Retained Earnings	415,327	516,654
Total Stockholders' Equity	\$ 671,658	\$ 778,904
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	\$3,445,019	\$3,223,323

* Data from Forms MA-172 filed by 23 subsidized companies.

Appendix II: (Continued)

Statement B—Combined Condensed Income Statement for the Years Ending December 31, 1985 and 1984 (Amounts Stated in Thousands of Dollars)

	1985	1984
Shipping Revenue	\$2,843,610	\$2,705,983
Operating-Differential Subsidy	324,409	330,514
Other Shipping Operations Revenue	174,922	125,948
Total Revenue from Shipping Operations	<u>\$3,342,941</u>	<u>\$3,162,445</u>
Vessel Expense	\$1,093,552	\$1,096,613
Voyage Expense	1,589,611	1,312,530
Total Expense of Shipping Operations	<u>\$2,683,163</u>	<u>\$2,409,143</u>
Gross Income from Shipping Operations	\$ 659,778	\$ 753,302
General and Administrative Expense	412,025	363,716
Depreciation and Amortization Expense	115,958	113,701
Interest Expense	176,407	142,486
Shipping Operations Net Profit	\$ - 44,612	\$ 133,399
Other Income	47,678	68,160
Other Expense	54,019	24,924
Net Income Before Income Taxes	\$ - 50,953	\$ 176,635
Provision for Income Taxes	- 7,581	29,217
Net Income After Income Taxes	\$ - 43,372	\$ 147,418
Extraordinary Items	1,386	- 8,896
NET INCOME	<u>\$ -41,986</u>	<u>\$ 138,522</u>

Appendix III: RESEARCH AND DEVELOPMENT CONTRACTS AWARDED—FISCAL YEAR 1986

Project	Task	Vendor	Contract Number	Amount
Advanced Ship Development and Technology				
Shipbuilding Research:				
Shipbuilding Outfitting & Production Aids Program*	Technology transfer and direction including completion of ongoing projects for this technical area, and dissemination of research on advanced shipbuilding technology for increased productivity.	Todd Pacific Shipyards San Pedro, CA	MA-11983	\$ 60,000
Shipbuilding Flexible Automation Research Program*	Technology transfer and direction including completion of ongoing projects for this technical area, and dissemination of research on advanced shipbuilding technology for increased productivity.	Todd Pacific Shipyards San Pedro, CA	MA-11985	\$ 60,000
Shipbuilding Standards Research Program *	Technology transfer and direction including completion of outgoing projects for this technical area, and dissemination of research on advanced shipbuilding technology for increased productivity.	Bath Iron Works Corp. Bath, ME	MA-11988	\$ 59,988
Shipbuilding Welding Research Program *	Technology transfer and direction including completion of ongoing projects for this technical area, and dissemination of research on advanced shipbuilding technology for increased productivity.	Ingalls Shipbuilding Div. Litton Industries Pascagoula, MS	MA-11989	\$ 60,000
Shipbuilding Industrial Engineering Research Program *	Technology transfer and direction including completion of ongoing projects for this technical area, and dissemination of research on advanced shipbuilding technology for increased productivity.	Bath Iron Works Corp. Bath, ME	MA-11990	\$ 59,990
Shipbuilding Education and Training Program *	Technology transfer and direction including completion of ongoing projects for this technical area, and dissemination of research on advanced shipbuilding technology for increased productivity.	University of Michigan Ann Arbor, MI	MA-11991	\$ 88,994
Shipbuilding Research Program Management *	Technology transfer and direction including completion of ongoing projects for this technical area, and dissemination of research on advanced shipbuilding technology for increased productivity.	Ingalls Shipbuilding Div. Litton Industries Pascagoula, MS	MA-11992	\$ 99,542

* Cost Shared

Appendix III: Continued

Project	Task	Vendor	Contract Number	Amount
Shipbuilding Surface Preparation and Coating Research Program *	Technology transfer and direction including completion of ongoing projects for this technical area, and dissemination of research on advanced shipbuilding technology for increased productivity.	National Steel and Shipbuilding Company San Diego, CA	MA-11993	\$ 43,695
Ship's Machinery and Outfitting:				
Enhanced Heavy Fuel Capability of Marine Diesels—Part 2	Research, test and evaluation of thick film ceramic coatings. A coordinated effort with major U.S. engine manufacturers.	U.S. Department of Energy Lawrence Berkeley Laboratory Oakland, CA	400-67009	\$ 200,000
Application and Demonstration of Advanced Turbocharger Technology to the Main Propulsion Diesel Engines of River Towboats*	The identification of the benefits and savings from the retrofitting of turbochargers incorporating the most recent advances in design, performance, materials and efficiency aboard an operating towboat.	Seaworthy Systems, Inc. Essex, CT	60101	\$308,755
Development and Demonstration Applying the Three Wheel Turbocharger Concept to Series 149 Engines*	The investigation of the fuel efficiency advantages provided marine engines by advanced turbocharging and charge air cooling techniques.	Detroit Diesel Allison Div. General Motors Corporation Detroit, MI	60105	445,088
Marine Science:				
Ship Structure Committee*	MARAD's share to participate in the Ship Structure Committee FY 1986 Program.	U.S. Coast Guard Washington, D.C.	400-67004	150,000
Trafficability Tests*	To continue full scale ship tests under heavy ice conditions to collect environmental, maneuvering and structural loads data and other design information.	ARCTEC Engineering Inc. Columbia, MD	41032	534,589
Ship Dynamic Performance Control	To complete development and testing of the Marine Coefficient Information System (MARCIS).	System Control Technology Palo Alto, CA	01092	129,988
Maneuvering Simulation Model	To advance maritime technology through better methods of predicting ship resistance from scaled model tests and more realistic simulation models and improvement in operational efficiency and safety of ships.	Massachusetts Institute of Technology Cambridge, MA	41014	63,179

* Cost Shared

Appendix III: Continued

Project	Task	Vendor	Contract Number	Amount
Statistical Analysis of NonLinear Ship Motions	To develop probabilistic methods needed to make statistical predictions of the extreme motions, loads, and other responses affected by nonlinearities as the ship moves through severe random seas.	University of California Berkeley, CA	60107	\$ 44,953
Novel Treatment for Antifouling and Drag Reduction on Ship Hull Materials	To demonstrate the proof-of-concept for a "Teflon-like" antifouling compound. The work transfers a "breakthrough" in antifouling of membranes to ship hull materials.	Georgia Tech Research Corp. Georgia Institute of Tech. Atlanta, GA	60116	54,929
Tripping of Asymmetrical Stiffeners Under Combined Loading	To formulate torsional design methodology for stiffeners which will take into account cross sectional distortion and imperfections.	Lehigh University Bethlehem, PA	60117	50,000
Coastal Offshore Transport by Barges and Mini-Ships	To identify the problems and potential for coastal and offshore commerce by barges and mini-ships. The focus will be on benefits to ports, vessel operators, and shippers.	Louisiana State University Baton Rouge, LA	60118	48,670
Bow Impact Loads Including the Effects of Flare	The second phase of a two year program intended to study bow impact loads including the effects of flare. It is fundamental research aimed at increasing the understanding of the effects of flare impact loads on the ship design process.	University of Michigan Ann Arbor, MI	60120	31,977
Liquid Sloshing Loads Under Random Excitations.	Previous support resulted in the development of a numerical model for predicting liquid sloshing loads. It is proposed to continue the investigation by incorporating ship motions.	Texas A&M Research Foundation College Station, TX	60121	50,000
Establishing a Generalized Hydrodynamic Force Module for Interacting Ships in a Shallow Asymmetric Canal	The research will apply theoretical hydrodynamic analysis to determine forces acting on two ships moving in an asymmetric shallow depth canal.	Virginia Polytechnic Institute & State University Blackburg, VA	60122	45,015
Market Development:				
Analysis of Southeast Asian Shipping	Provide intelligence on the likely shipping initiatives of Southeast Asian nations and develop U.S. strategies to minimize impact.	S.R.I. International Menico Park, CA	60102	140,149

* Cost Shared

Appendix III: Continued

Project	Task	Vendor	Contract Number	Amount
AGENCY SUPPORT				
Advanced Ship System:				
Navigation/Communications Project	To complete Volume II Requirements Definition Statement and work on Volume III State of the Art Systems.	Transportation Systems Center Cambridge, MA	86MA602 (GWA 400-67005)	95,000
Small Business Innovative Research	To finance MARAD's share of the Department of Transportation's Small Business Innovative Research program for Fiscal Year 1986.	Transportation Systems Center Cambridge, MA	400-67007	98,200
Marine Board FY 1986*	To continue support of the Marine Board of the National Academy of Science.	Dept. of Interior Washington, D.C.	400-67003	200,000
ADVANCED SHIP OPERATIONS				
Fleet Management:				
Development of a Prototype for a Shipboard Contingency Planning System*	Develop a computer-based decision support system to give the Master of the vessel the information needed to take the best possible course of action in the event the ship becomes damaged due to flooding, grounding, collision, or other causes.	American Bureau of Shipping Paramus, New Jersey	60109	\$ 135,181
Construction of a Prototype Expert System to Provide Decision Support for Storage Planning*	Build and test an expert computer system to assist in stowage planning for a containership. Feasibility will be established by building a working prototype and benefits established by exercising the prototype.	Offshore Technology Corp. Escondido, CA	60129	115,371
Development of a Demonstration Automated Customer Information System*	Develop an automated system to enable customers of a shipping company to make inquiries on the status of their shipments via a touch-tone telephone.	August Design and Development Wynnewood, PA	60130	37,647
Fleet Management Technology Conference Support	Conduct planning for 1987 Fleet Management Technology Conference and provide support in all aspects of administering the conference.	Phillips Cartner & Co. Alexandria, VA	61125	9,500

* Cost Shared

Appendix III: Continued

Project	Task	Vendor	Contract Number	Amount
Ship Performance and Safety				
Ship Performance Monitoring System Development and Sea Testing*	An amendment was issued for this project for the development of a system which will provide ships with accurate and timely measures of fuel consumption attributable to hull and propeller roughness and fouling, plant inefficiencies, ballasting and trim, navigation and steering, wind, and heavy seas.	Erskine System Control Champaign, IL	MA-11831	\$ 56,114
Cargo Handling:				
Cargo Handling Cooperative Program*	Carry out research, development, test and evaluation of new technologies, system, and methods directed at increasing the cargo handling productivity of U.S. flag carriers.	American President Lines Matson Navigation Co. Sea-Land Service United States Lines	MA-11715	1,375,140
Military Sealift:				
Feasibility of Defense-Relevant Designs in Specific Segments of Commercial Marketplace	Evaluate the feasibility of defense-relevant designs in specific segments of the commercial marketplace. Identify the implications of defense-relevant ship technology in these trades and identify the economic, operational, regulatory, institutional, and technological barriers that discourage investment in defense-relevant ships.	Temple, Barker & Sloane Lexington, MA	60108	134,970
Research into the Use of Mobile Offshore Drilling Units (MODU) as Flexible Initial Response Shipping Terminals	Studies will be performed of both jack-ups and semis with a view to developing in situ port facilities using their existing cargo handling, power generation, accommodation, and other facilities. This would allow non self-sustaining merchant ships such as large container ships to offload efficiently at unimproved sites.	ARCTEC Engineering, Inc. Columbia, MD	60125	\$ 154,656
Improvement of Loading/Unloading Break Bulkers	Study and testing of cargo lifting device which can be installed without major changes to hatchways or hull structure. A readily installed device which could augment or replace the conventional rig operation could be considered a good addition for improving cargo loading and unloading rates.	MacGregor-Navire (USA), Inc. Cranford, NJ	60126	53,900

* Cost Shared

Appendix III: Continued

Project	Task	Vendor	Contract Number	Amount
Stabilized Shipboard Crane for Military Sealift Operations	Develop and study the appropriate sensors and computer algorithms, and the drive systems to restrain crane-suspended cargo in all six degrees of freedom.	Franklin Research Center Philadelphia, PA	60127	\$ 71,250
Acoustic Quieting of Commercial Ocean Transportation Systems	Determine the levels of acoustic quieting necessary to substantially increase the survival prospects for ocean transportation systems in the projected environments. Potential restructuring of risk assessments/actual risks/liability structure.	Epoch Engineering, Inc. Gaithersburg, MD	60128	66,550
Port and Intermodal:				
Upper Mississippi River Transportation Economic Study*	Analyze those operating practices which affect the financial health of the towing industry on the Upper Mississippi River. Establish criteria which may be applied to those practices and thereby make them measures of performance which can trigger changes in operations in response to changes in the waterway system or the market.	Iowa Dept. of Transportation Ames, Iowa	MA-11971	100,000
Community Cargo Release System (CCRS)	Development of a design for a computerized system for the release by U.S. Customs of import cargo for smaller ports, brokers, carriers, etc., in accordance with new requirements for computerized input.	Northern California Ports & Terminals Bureau, Inc. Redwood City, CA	MA-12025	75,000
Port Trade Data Access System*	Provide access, support, maintenance and enhancements to the Maritime Information and Data Access System (MIDAS), developed in FY 85-86. MIDAS's five-year, census and preference cargo data supports analysis in the areas of port planning, utilization of U.S.-flag fleet and bilateral trade negotiation.	Transportation Systems Center Cambridge, MA	86MA601 (GWA 400-67005)	80,000

* Cost Shared

Appendix III: Continued

Project	Task	Vendor	Contract Number	Amount
RESEARCH FACILITIES				
Computer-Aided Operations Research Facility (CAORF)				
Management and Operations**	To provide daily management and operation at CAORF, for the period March 1, 1986, through September 30, 1986.	Ship Analytics, Inc. Centerport, NY	30002 50113	\$ 107,989 324,000
Engineering Maintenance Support**	To provide daily technical maintenance and engineering support to CAORF for the period October 1, 1985 through September 30, 1986.	Sperry Systems Management Great Neck, NY	50124	1,911,017
Technical Research Experimenter**	To provide technical research for maritime studies at CAORF for the period October 1, 1986, through September 30, 1986.	Ship Analytics, Inc. Centerport, NY	50113	1,096,692
Data Conversion of Kings Bay Model Output**	Data conversion of the Kings Bay current model output to a form compatible with the CAORF simulation model.	Waterways Experiment Station Vicksburg, MS	400-67006	35,000
Reduction of Numerical Model Current Study Data**	This data is for use in a CAORF simulator evaluation of planned waterway design modifications in Miami Harbor.	Waterways Experiment Station Vicksburg, VA	400-67008	7,000
National Maritime Research Center (NMRC)—Kings Point				
MARCIS Trials	Tracking & current services to support KINGS POINTER/MARCIS trials.	Ocean Surveys, Inc. Old Saybrook, CT	P.O. 32327	\$ 14,980
MARCIS Laboratory Acceptance Tests	Engineering support for Marine Coefficient Identification System (MARCIS) laboratory acceptance tests.	Maritime Engineering Services Dixhills, NY	50135	6,762
Engineering Support for KINGS POINTER Sea Trials	Engineering support for sea trials on the KINGS POINTER utilizing MARCIS instrumentation system.	Maritime Engineering Services Dixhills, NY	50135	23,039
Maritime Technical Literature Development & Control	Acquisition, cataloging, distribution and control of NMRC Study Center Resources.	Seatrack Great Neck, NY	30023	106,800
Documentation Preparation and Management	To provide technical review and report and distribution of NMRC/CAORF reports and documents.	Barje Co. Belmore, NY	54620	24,800

* Cost Shared

** Costs are wholly or partially reimbursed by non-MARAD sources.

Appendix IV: STUDIES AND REPORTS RELEASED IN FY 1986

The following major studies or reports were released by the Maritime Administration during fiscal year 1986.

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

MARAD 1985 (The Annual Report of the Maritime Administration for Fiscal Year 1985), 64pp [MARAD].

Foreign Flag Merchant Ships Owned by U.S. Parent Companies, as of January 1, 1986, prepared by the Maritime Administration, 19pp [MARAD].

Port Handbook for Estimating Marine Terminal Cargo Handling Capacity, prepared by Moffatt & Nichols Engineers, November 1986, [NTIS].

Vol. I (Executive Summary) PB87-121133/AS \$11.95
Vol. II (Main Report) PB87-121125/AS 18.95

Relative Cost of Shipbuilding, prepared by the Maritime Administration, October 1986, 36pp [MARAD].

Report on Survey of U.S. Shipbuilding and Repair Facilities, 1985, prepared by the Maritime Administration, December 1985, 133pp [MARAD].

Automated Port Pricing Model, prepared by Applied Systems Institute, [NTIS].

Vol. I (Executive Summary & Main Report) PB87-131033 \$18.95
Vol. II (User's Manual) PB87-131025 11.95
Diskettes (3) PB87-131041 105.00

A Statistical Analysis of the World's Merchant Fleets, prepared by the Maritime Administration, 1985, [MARAD].

Microcomputer-Based Part Power Heat Balance Program for Commercial Marine Steam Turbine Propulsions Systems, prepared by Seaworthy Systems, November 1985, [NTIS].

Executive Summary PB86-166956/AS \$ 9.95
User's Guide PB86-166964/AS 16.95

Microcomputer-Based Planning System for Liner and Bulk Shipping Operators, prepared by Temple, Barker and Sloane, September 1985, [NTIS].

Executive Summary PB86-159902/AS \$ 9.95
User's Guide (Liner Operators) PB86-159910/AS 16.95
User's Guide (Bulk Shipping Operators) PB86-159928/AS 16.95

Operations Planning and Vessel Performance Measurement, prepared by Ingram Barge Co., April 1986, [NTIS].

Executive Summary PB86-247822/AS \$ 9.95
Technical Report PB86-247830/AS 11.95

Note: Reports prepared or issued by the Maritime Administration in previous years are listed in *MARAD PUBLICATIONS*, which is available upon request from headquarters and field offices of the Agency.

Acknowledgments

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

Lake Carriers' Association
United States Navy
United States Merchant Marine Academy
The Waterways Journal
Alabama State Docks
John Dubas, Dravo Corp.
The Port of Seattle
The Port of New Orleans