



U.S. Department
of Transportation

**Maritime
Administration**

MARAD '81



Note:

During this reporting period the Maritime Administration was transferred from the U.S. Department of Commerce to the Department of Transportation. While this report was in preparation Admiral Harold E. Shear, USN (Ret.), was appointed by the President and confirmed by the U.S. Senate as Maritime Administrator.

About the first two pictures in this report: On page iv, Towboat J. PAGE HEYDEN, owned by M/G Transport of Cincinnati, Ohio, creates ripples by the dozen in placid Ohio River as it moves 15-barge tow past Louisville, Ky.

In photograph on page vi, 37,500-deadweight-ton tanker S.S. COAST RANGE slides down ways at National Steel and Shipbuilding Co., San Diego, Calif. Carlsbad Class Product carrier was second of three sister ships delivered by NASSCO to Union Oil Co. of California in 1981. Bulbous bow improves vessel's speed.

MARAD '81

The Annual Report of the
Maritime Administration
for Fiscal Year 1981

U.S. Department of Transportation
Andrew L. Lewis, Jr., Secretary

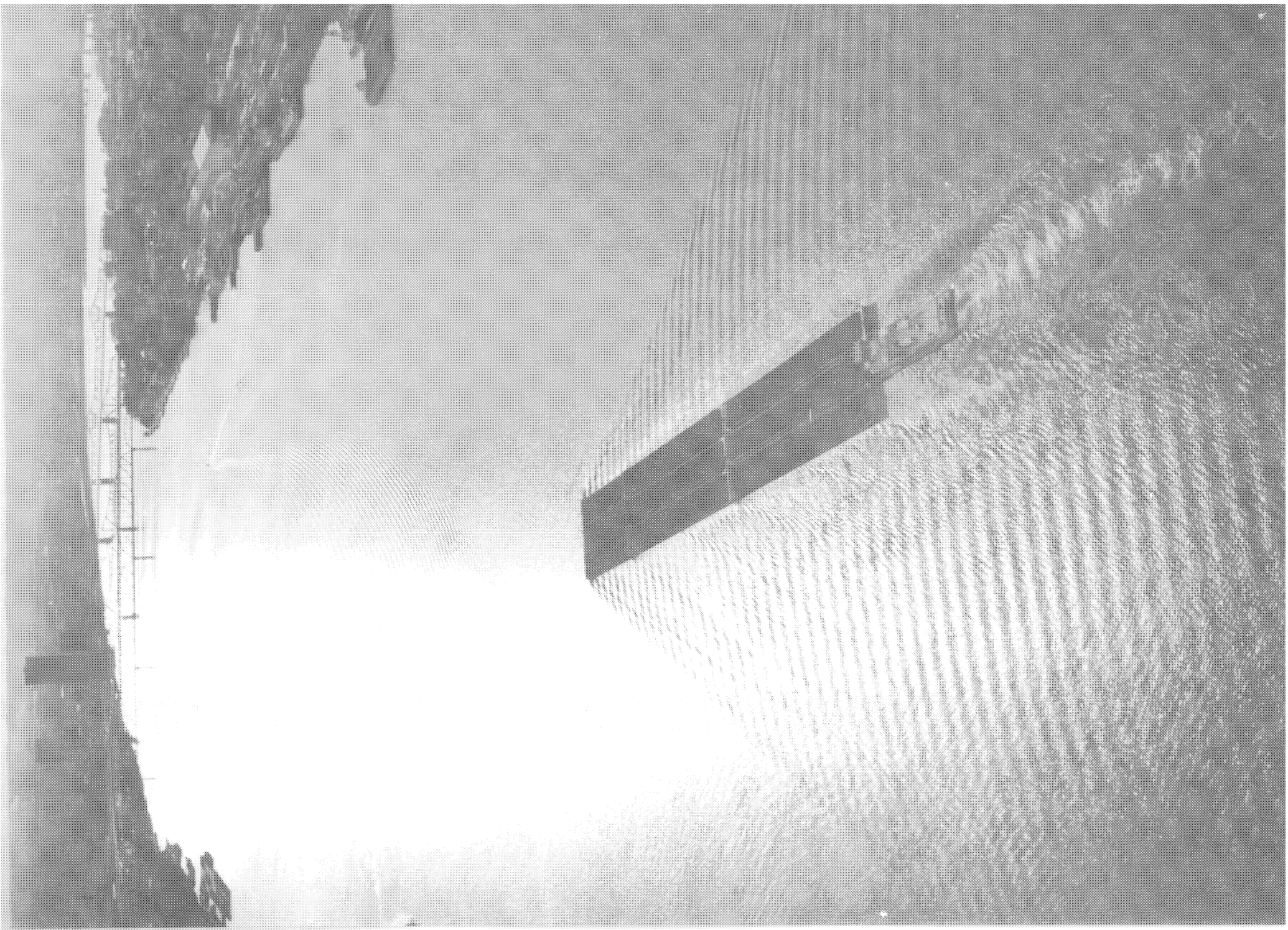
Maritime Administration
Harold E. Shear, Administrator

OCTOBER 1982

CONTENTS

Transmittal Letter		Chapter 5—Port and Intermodal Development	
Foreword	1		34
Chapter 1—Shipbuilding	2	Annual Report to Congress	34
Ship Deliveries	2	Activities Related to Coal	34
Construction-Differential Subsidy	3	Technical Port Assistance	34
Section 615 Applications	3	Port Planning Program	34
Title XI Guarantees	3	Equipment and Facilities Program	36
Capital Construction Fund	4	Chapter 6—Research and Development	38
Construction Reserve Fund	5	Shipbuilding	38
National Defense Features	6	Ship's Machinery	38
Ship Design and Engineering	6	Fleet Management	38
Shipyard Improvements	6	Ship Performance and Safety	39
Disadvantaged Business/Women's Business Enterprise Program	7	Cargo Systems	39
Chapter 2—Ship Operations	14	CAORF	40
U.S. Fleet Profile	14	Navigation/Communications	41
Operating-Differential Subsidy	14	Advanced Ship Systems	41
New Section 614	14	Marine Science	41
Corporate/Service Changes	14	University Research	42
Contract Awards	14	Chapter 7—Maritime Labor and Training	43
Pending Applications	14	Maritime Training	43
Subsidy Rates	17	U.S. Merchant Marine Academy	43
Soviet Grain ODS	17	State Maritime Academies	43
Grain Freight Rates	18	Labor Relations	44
Soviet Grain ODS Awards	18	Labor Data	44
China Maritime Agreement	19	Merchant Marine Awards	44
Trade-Ins	19	Chapter 8—National Security	46
Passenger Service	19	Reserve Fleet	46
Section 804 Activities	23	Ready Reserve Fleet	46
International Bulk Trades	24	NDRF Energy Conservation	46
Foreign Transfers	25	Ship Sales	46
Environmental Protection	26	War-Risk Insurance	46
Chapter 3—Domestic Operations	27	Marine Insurance	47
Great Lakes	27	Emergency Readiness	47
Inland Waterways	27	Industrial Preparedness	49
Domestic Ocean Trades	27	Chapter 9—International Activities	50
Charter Market Activity	29	U.S.-P.R.C. Maritime Agreement	50
Trade Studies	29	U.S.-U.S.S.R. Maritime Agreement	50
Chapter 4—Market Development	30	Latin American Maritime Agreements	50
Marketing Program	30	U.S.-Canada Cooperation	50
Marketing Analysis and Planning	30	International Conferences	50
Bilateral Cargo Agreements	30		
Preference Cargoes	32		
Department of Defense	32		
Strategic Petroleum Reserve	32		
Export-Import Bank	33		

Chapter 10—Administration	52	7 Capital Construction Fund Holders—September 30, 1981	12	Appendices:	
Maritime Subsidy Board	52			I Maritime Subsidy Outlays—1936–1981	61
Administrative Law Proceedings	52	8 Construction Reserve Funds—September 30, 1981	13	II Combined Condensed Financial Statements of Companies with Operating-Differential Subsidy Contracts	62
Legal Services, Legislation, and Litigation	52	9 U.S. Oceangoing Merchant Marine—September 30, 1981	15	III Research and Development Contracts Awarded—Fiscal Year 1981	64
Management Initiatives	53	10 Employment of U.S.-Flag Oceangoing Fleet—September 30, 1981	16	IV Studies and Reports Released in FY 1981	78
Audits	53	11 Major Merchant Fleets of the World—January 1, 1981	17	Acknowledgments	79
Financial Analysis	53	12 U.S. Oceanborne Foreign Trade/Commercial Cargo Carried	19		
Management Information	54	13 ODS Accruals and Outlays—January 1, 1937, to September 30, 1981	20		
Personnel	54	14 Operating-Differential Subsidy Accruals and Outlays by Lines—January 1, 1937, to September 30, 1981	21		
Installations and Logistics	54	15 ODS Contracts in Force September 30, 1981	22		
Real Property	54	16 Soviet Grain ODS Contracts in Effect September 30, 1981	25		
Accounting	55	17 Foreign Transfer Approvals—FY 1981	26		
Maritime Administration Organization Chart	56	18 U.S. Great Lakes Fleet September 30, 1981	28		
Maritime Administration Field Organization Chart	57	19 Government-Sponsored Cargoes—Calendar Year 1980	31		
Financial Statements	58	20 Maritime Workforce Average Monthly Employment	45		
Exhibit 1 Statement of Financial Condition	58	21 National Defense Reserve Fleet—September 30, 1981	47		
Exhibit 2 Statement of Operations	60	22 National Defense Reserve Fleet, 1945–1981	48		
Notes to Financial Statements	61	23 Marine and War-Risk Insurance Approved in FY 1981	48		
Tables:					
1 Ships Under CDS—September 30, 1981	4				
2 Private Ship Construction Contracts Awarded in FY 1981	6				
3 New Ships Delivered From U.S. Shipyards During FY 1981	7				
4 Worldwide Ship Deliveries—Calendar Year 1980	8				
5 Ship Financing Guarantees—Commitments Approved in 1981	8				
6 Federal Ship Financing Guarantees Program (Summary)	11				





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

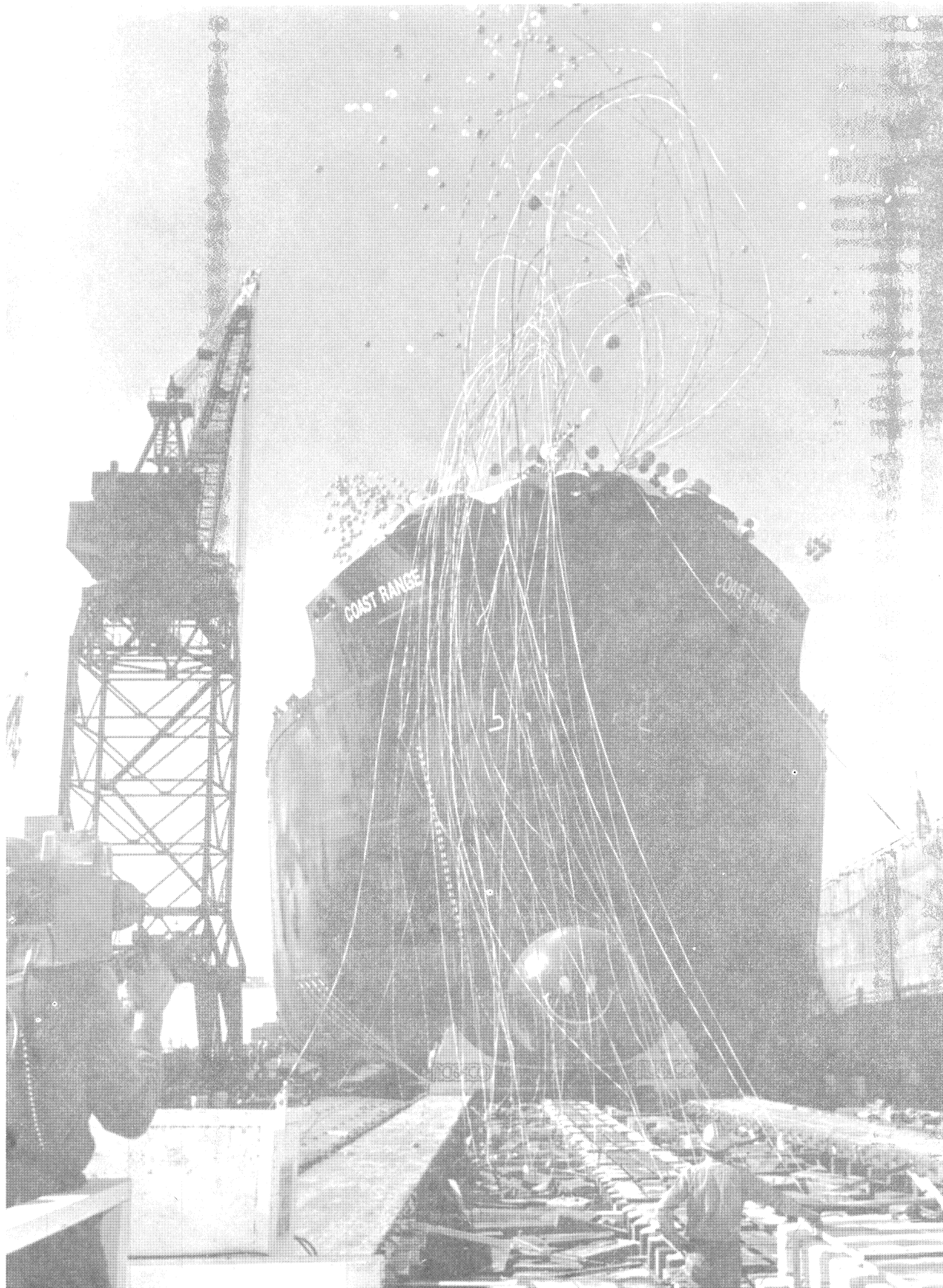
The Honorable Thomas P. O'Neill
Speaker of the House
of Representatives
Washington, D.C. 20515

Dear Sirs:

I have the pleasure of forwarding to you the annual report of the Maritime Administration for fiscal year 1981 as required by the Merchant Marine Act, 1936, as amended.

Sincerely,

Drew Lewis



FOREWORD

The Annual Report of the Maritime Administration (MARAD) is submitted in accordance with the Merchant Marine Act of 1936, as amended. It reviews the Agency's activities in administering Federal maritime programs and pertinent developments which affected the U.S. maritime industry in the fiscal year ending September 30, 1981.

The status of the industry as of that date was not good. Government programs conducted under the basic 1936 act and expanded and improved under the Merchant Marine Act of 1970—all launched with high hopes—had failed to stem the industry's decline. A change in course was necessary.

During this reporting period, the Administration took a number of steps toward formulating and implementing corrective policy actions.

As an important first step, the President requested and the Congress quickly approved the transfer of the Maritime Administration from the Department of Commerce to the Department of Transportation (DOT). This action became effective on August 6, 1981, with the signing of the enabling legislation (Public Law 97-31).

The physical move to DOT began with the transfer of the Agency's headquarters staff and other components to Departmental headquarters in September 1981.

Concurrently with the Agency's transfer, the President designated the Secretary of Transportation as his spokesman in maritime affairs, providing the U.S. industry with a Cabinet-level ombudsman for the first time.

Soon after I was sworn in as Maritime Administrator on October 19, the Secretary directed me to begin a program-by-program and issue-by-issue review of the U.S. maritime policy.

Pending the initiation of workable maritime programs, the Administration also announced reductions in two maritime financial-support areas in line with the President's Economic Recovery Program. The cutbacks occurred in the funding of construction-differential subsidy (CDS) and in reduced ceilings established by the President for MARAD's Ship Financing Guarantees Program under Title XI of the 1936 act.

No new CDS funds were requested in Federal budgets for either FY 1982 or FY 1983 pending further review of the program's effectiveness.

Ceilings for the Title XI program administered by the Maritime Administration were set at \$675 million for FY 1982 and \$600 million for FY 1983 as part of an effort to reduce the Government's impact on the commercial credit market.

Meanwhile, in the absence of CDS funding, Congress authorized a new—and temporary—build-abroad option for eligible recipients of, or applicants for, operating-differential subsidy. Under this program, contained in a new Section 615 of the 1936 act, a number of U.S.-flag ship operators sought the Maritime Administration's permission to acquire new ships or reconstruct vessels abroad. Processing of these applications was begun late in FY 1981 and was continuing at year's end.

H. E. SHEAR
Maritime Administrator

Shipbuilding

During fiscal year 1981, the Maritime Administration (MARAD) granted construction-differential subsidy (CDS) for the construction of three new merchant vessels and the conversion of 19 existing ships (see Table 1).

The new ships have a total contract value of \$142.6 million, with the Government's share set at \$71.3 million, including national defense features (NDF). They include two product tankers for Falcon I Sea Transport Co. and one small inter-island trailer carrier for Blue Lines, Inc.

Of the total contract value of \$143.1 million for the subsidized conversion work, the Government will pay \$64.9 million, including national defense features. These projects are:

- Major retrofits to comply with provisions of the Port and Tanker Safety Act of 1978, including seven crude oil carriers and two ore/bulk/oil carriers (OBOs) for five Berger Group companies and two crude oil carriers for Chestnut Shipping Co.
- Insertion of 115-foot midbodies, installation of 40-ton cranes, and modification of existing holds to convert four Moore McCormack Lines, Inc., cargo ships to larger self-sustaining breakbulk/container vessels.
- Reconstruction of two U.S. Lines, Inc., containerships to increase carrying capacity from 1,028 to 1,340 twenty-foot containers and modifications of cargo holds to carry 40-foot containers; and
- Reconstruction of two Delta Steamship Lines, Inc., breakbulk cargo ships to increase cargo lift capacity and to provide for carriage of 62 twenty-foot containers on deck.

Also during the year, private contracts were awarded for the construction of four unsubsidized commercial vessels totaling 163,500

deadweight tons (dwt.). These contracts included three large product tankers and a coal-fired collier, the first coal-fired steam turbine vessel to be built in a U.S. shipyard since 1958 (see Table 2).

On September 30, 1981, 35 deep-draft merchant vessels totaling 1.2 million dwt. and valued at \$2.2 billion were under construction or on order in American shipyards. Of that total, 11 were being built with the aid of construction subsidy (as was one smaller vessel noted in this chapter); all but one of these were also participating in the Federal Ship Financing Guarantees (Title XI) Program. An additional 17 of the 24 privately financed vessels carry Title XI guarantees.

Also at the end of FY 1981, 78 off-shore oil-drilling rigs valued at approximately \$2.7 billion were in production or on order in 12 U.S. shipyards, compared with 59 units one year earlier.

Ship Deliveries

American shipyards delivered 18 new merchant vessels totaling 550,800 dwt. during fiscal year 1981 (see Table 3).

Seven of the delivered vessels were subsidized:

- The 40,680-dwt. lighter-aboard-ship (LASH) vessel EDWARD RUTLEDGE, built by Avondale Shipyards for Waterman Steamship Corp. for service between the U.S. Gulf/East Coasts and the Far East;
- The 2,000-dwt. multi-purpose cargo ship ANTILLIA, built by Equitable Shipyards for American Atlantic Shipping, Inc., for service between the U.S. Atlantic/Gulf Coasts and the Caribbean, Central America, and South America;
- The 27,340-dwt. containership AUSTRAL PURITAN, built by Bethlehem Steel at Sparrows Point, Md., for Farrell Lines, Inc., for service between the U.S. Atlantic/Gulf Coasts and Australia/New Zealand;
- The 32,100-dwt. dry-bulk carrier PRIDE OF TEXAS, built by Lev-

ington Shipbuilding Co. for Asco-Falcon I Shipping Co. for worldwide bulk trading; and

- The three 39,500-dwt. integrated tug/barge chemical/oil vessels—OXY TRADER, OXY PRODUCER, and OXY GROWER—built by Avondale Shipyards for subsidiaries of Occidental Petroleum Corp. for service between the U.S. East Coast and the Soviet Union.

The tug of OXY PRODUCER sank in the Atlantic on September 20, 1981.

Delivery of these seven vessels brought to 68 the number of subsidized ships contracted for and delivered since enactment of the Merchant Marine Act of 1970.

The 11 unsubsidized vessels delivered in FY 1981 were:

- The two 31,000-dwt. product tankers, NEW YORK SUN and PHILADELPHIA SUN, built by Sun Ship for Sun Transport, Inc., for U.S. coastwise and intercoastal service;
- The two 37,500-dwt. product tankers, BLUE RIDGE and COAST RANGE, built by National Steel and Shipbuilding Co. for Union Oil Co. of California for U.S. coastwise service;
- The 42,000-dwt. product tanker OGDEN DYNACHEM, built by Avondale Shipyards for Ogden Shamrock Transport Inc., for U.S. intercoastal service;
- The 24,800-dwt. self-unloading ore carrier AMERICAN REPUBLIC, built by Bay Shipbuilding for American Steamship Co. for operation on the Great Lakes;
- The 67,500-dwt. self-unloading ore carrier WILLIAM J. DeLANCEY, built by AMSHIP, Lorain, Ohio, for Interlake Steamship Co. for operation on the Great Lakes;
- The 78,850-dwt. self-unloading ore carrier COLUMBIA STAR, built by Bay Shipbuilding Corp. for Oglebay Norton Co. for operation on the Great Lakes;
- The diesel-propelled oceangoing hopper dredge EAGLE I, built by

Avondale Shipyards for Eagle Dredging Corp.;

- The diesel-propelled oceangoing hopper dredge YAQUINA, built by Norfolk Shipbuilding & Drydock Corp. for the U.S. Army Corps of Engineers; and
- The diesel-propelled oceangoing hopper dredge PADRE ISLAND, built by Southern Shipbuilding Corp. for Great Lakes Dredge & Dock Co.

Table 4 lists deliveries of merchant vessels by major shipbuilding nations during calendar year 1980.

Construction-Differential Subsidy

MARAD is authorized to pay construction-differential subsidy to reduce or eliminate the cost disparity which exists between U.S. and foreign shipbuilding prices. The subsidy is the difference between shipbuilding costs in a U.S. shipyard and a reasonable estimate of costs in a foreign shipyard, but may not exceed 50 percent of the domestic costs. (See Appendix I for CDS expenditures since 1936.) To be eligible for CDS, vessels must be built in U.S. shipyards, owned by U.S. citizens, crewed by U.S. citizens, and operated under the U.S.-flag in the Nation's essential foreign commerce.

The combined costs of the vessels which were under CDS contracts for construction and reconstruction on September 30, 1981, totaled \$871.6 million, of which \$427.1 million (CDS plus NDF) will be paid by the Government. The 12 new vessels being built with CDS consisted of two liquid product carriers, three containerships, two dry-bulk carriers, one integrated tug/barge, three RO/RO containerships, and one small trailer carrier. The reconstructed vessels consisted of four general cargo vessels, four containerships, nine tankers, and two OBOs.

Section 615 Applications

A provision of the Omnibus Budget Reconciliation Act of 1981, enacted July 29, amended the Merchant Marine Act of 1936 to authorize operators receiving or applying for operating-differential subsidy to construct, reconstruct, or acquire vessels in foreign shipyards under certain circumstances. Under the law, designated new Section 615 of the 1936 act, an operator must receive written certification from the Secretary of Transportation that its CDS application cannot be approved due to the unavailability of funds in the CDS account. The law provides that such authorization may be given through September 30, 1983.

As of September 30, 1981, two subsidized operators had requested Section 615 authorization to reconstruct vessels in foreign shipyards.

Title XI Guarantees

Title XI of the Merchant Marine Act of 1936, as amended, established the Federal Ship Financing Guarantees 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 in U.S. shipyards. Title XI was amended in 1972 to provide direct Government guarantees of the underlying debt obligations for future transactions, with the Government holding a mortgage on the equipment financed.

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

Title XI guarantees of approximately \$1 billion covering 550 vessels (see Table 5) were conditionally approved by MARAD during this fiscal year. Included was financing for 20 deep-draft vessels with an

aggregate guarantee amount of about \$400 million. In all, 264 deep-draft vessels with contracts totaling nearly \$5 billion have been covered by the program.

Based on previous Title XI commitments, guarantees were placed on 428 vessels and 73 LASH lighters during this reporting period.

As of September 30, 1981, Title XI guarantees in force amounted to approximately \$7.9 billion of principal. Applications pending on the date exclusive of liquefied natural gas vessels and drill ships and drill rigs represented approximately \$2 billion in additional guarantees (see Table 6). Under prevailing policy, priority in processing the backlog was given applications for general cargo vessel financing.

During FY 1981, Congressional authority for the Title XI program totaled \$12 billion. Of this amount, \$9.5 billion was reserved for MARAD's Ship Financing Guarantees Program, \$1.65 billion was restricted for use in financing ocean thermal energy conversion vessels and facilities by the Department of Energy, and \$850 million was set aside for use in financing fishing vessels by the National Oceanic and Atmospheric Administration.

The President's March 10, 1981, budget message limited the level of new Title XI commitments by MARAD in FY 1981 to \$900 million. However, in August 1981, \$150 million previously authorized for fiscal year 1982 was shifted to FY 1981, resulting in a ceiling of \$1,050 million in FY 1981.

The total costs of the Title XI program, including salaries of the MARAD staff employed in the merchant ship financing program, are underwritten by fees charged to 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.

Since the inception of the Title XI program, only 11 companies have defaulted.

During FY 1981, the Federal Ship Financing Fund had net income of \$50,991,711.

Table 1: SHIPS UNDER CDS—SEPTEMBER 30, 1981

Owner	Shipbuilder	Ship Type
Contracts Awarded in FY 1981:		
New Construction		
Blue Lines, Inc.	Atlantic Marine, Inc.	TC
Falcon I Sea Transport Co.	Bath Iron Works Corp.	COT
Conversions		
Aeron Marine Shipping Co.	Jacksonville Shipyards	COT
Apex Marine Corp.	National Steel & SB	COT
Aquarius Marine Co.	Jacksonville Shipyards	COT
Aries Marine Shipping Co.	Jacksonville Shipyards	OBO
Atlas Marine Co.	Jacksonville Shipyards	COT
Chestnut Shipping Co.	NW Marine Iron Works	COT
Delta Steamship Lines, Inc.	Buck Kreihs, Inc.	CN
Moore McCormack Lines, Inc.	American Ship Building	CG
Northwest Shipping Co.	National Steel & SB	COT
United States Lines, Inc.	Maryland SB & DD	CN
United States Lines, Inc.	Maryland SB & DD	CN
Yeon Shipping Co.	National Steel & SB	COT
Total (FY 1981)		
Undelivered Vessels Under Contracts Awarded Prior to FY 1981:		
American President Lines, Ltd.	Avondale	CN
Coordinated Caribbean Transport ²	Manhattan Barge/Norfolk	TB
Asco-Falcon II & III Shipping Co.	Levingston	DBC
Waterman Steamship Corp.	Sun Shipbuilding	RO/RO
Waterman Steamship Corp.	Sun Shipbuilding	RO/RO
Total (Prior to FY 1981)		
Total all Ships Under CDS September 30, 1981		

Capital Construction Fund

The Capital Construction Fund Program (CCF) 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 eligible deposits.

During FY 1981, \$405 million was deposited in these accounts. Since

the program was initiated in 1971, fund-holders (shown in Table 7) have deposited \$2.4 billion in CCF accounts and withdrawn \$2.0 billion for the modernization and expansion of the U.S. merchant marine.

The CCF program has broad applicability. It enables operators to build vessels for the U.S. foreign trade, the Great Lakes trade, the noncontiguous domestic trade (e.g., between the West Coast and Hawaii), and the fisheries of the United States. This program aids in the construction, reconstruction, or acquisition of a wide variety of vessels, including

containerships, LASH vessels, other types of cargo ships, tankers, LNG vessels, bulk carriers, tugs, barges, supply vessels, ferries, and passenger vessels.

The total value of projects completed or begun by CCF holders is approximately \$5.3 billion. The 104 fund holders listed in Table 7 have projected expenditures under this program totaling \$3.8 billion. Of this total, \$2.9 billion is projected for vessels operating in the U.S. foreign trade, \$445 million for the noncontiguous domestic trade, and \$456 million for the Great Lakes trade.

No. of Ships	Total Deadweight Tons	Estimated Completion Date	Total Estimated Cost ¹ (Millions)	Estimated CDS (Millions)	Estimated Cost NDF (Thousands)
1	78	2/82	0.6	0.3	2
2	56,400	1/84	142.0	70.3	720
2	179,400	12/81	10.0	4.4	546
1	89,700	6/82	6.9	3.0	271
1	89,700	11/81	5.2	2.3	273
2	161,000	3/82	8.0	3.5	359
1	89,700	10/81	5.2	2.3	273
2	179,400	3/82	8.5	3.4	674
2	26,078	2/81	1.7	0.5	-0-
4	64,280	5/83	72.8	30.1	815
1	89,700	10/81	6.9	3.0	289
1	20,000	4/81	5.5	2.6	244
1	20,000	5/81	5.5	2.6	244
1	89,700	11/81	6.9	3.0	256
22	1,155,136		285.7	131.3	4,966
3	98,400	11/82	273.0	135.3	1,066
1	6,771	12/81	24.2	11.1	-0-
2	70,000	7/82	80.8	40.3	-0-
2	77,000	9/82	137.4	66.4	1,573
1	38,500	4/82	70.5	34.4	742
9	290,671		585.9	287.5	3,381
31	1,445,807		871.6	418.8	8,347

¹ Total contract cost including CDS & National Defense Features (NDF), but excluding engineering & change orders.

² The Government has agreed to take title to the vessel. The project was interrupted when the yard originally contracted to build the barge portion ceased operations.

Key to Ship Types: CN = containership

TC = trailer carrier

COT = crude oil tanker

CG = cargo

TB = integrated tug/barge RO/RO = roll-on/roll-off van ship

DBC = dry bulk carrier

OBO = oil/bulk/ore carrier

Construction Reserve Fund

Like the Capital Construction Fund, the Construction Reserve Fund (CRF) encourages upgrading of the American-flag fleet. This program, authorized by the Mer-

chant Marine Act of 1936, as amended, 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 operating in coastwise trades, the inland water-

ways, and other trades not eligible for the CCF program. Its benefits are not so broad as those of the CCF.

In FY 1981, the number of companies with CRF balances decreased from nine to eight and the total on deposit in these funds decreased by \$8.7 million to \$6.8 million (see Table 8).

Table 2: PRIVATE SHIP CONSTRUCTION CONTRACTS AWARDED IN FY 1981

Owner	Shipbuilder	Type	No. Vessels	Total Deadweight Tons	Est. Completion Date	Total Cost (Millions)
New England Collier Co.	Gen. Dyn.-Quincy	Collier	1	36,000	1983	\$ 60
Exxon Co., USA	Avondale Shipyards	Tanker	3	127,500	1983/1984	255
Total Private Contracts—FY 1981			4	163,500		\$315

National Defense Features

The Merchant Marine Act of 1936, as amended, requires close cooperation between MARAD and the U.S. Navy to ensure that merchant ships can be rapidly adapted to meet U.S. national defense requirements. The Secretary of the Navy examines plans and specifications for vessels proposed for CDS and suggests changes which may be necessary for defense purposes. He also certifies that the ships are suitable for economical and speedy conversion into naval auxiliaries or are otherwise suitable for use in time of war or national emergencies. The changes suggested by the Navy are financed from the CDS account and must be accomplished in the United States. Shipowners not requesting subsidy for planned new construction may voluntarily participate in the National Defense Features Program.

With the enactment of Public Law 97-387, the program was amended to authorize the installation of national defense features on existing vessels. Pending the availability of funds, MARAD announced its intention to purchase and install on existing vessels communications equipment for national defense purposes.

Ship Design and Engineering

MARAD and the Navy closely cooperated during FY 1981 on planning for procurement of the Maritime

Prepositioning Ship (MPS), which was designed by MARAD in FY 1980. On August 22, 1980, MARAD—acting on behalf of the Department of Defense—invited bids from American shipyards for construction of the first two vessels in this projected series. During FY 1981, bid submission due dates were postponed a number of times due to lack of funding. As of the end of the year, MPS funding was limited to advance procurement of material, but no funds had been appropriated for ship construction and the bidding date had been suspended.

During the year, additional hydrodynamic model testing was conducted for further refinement of the MPS hull form.

MARAD's Security Class Mobilization Ship design program, which was interrupted to expedite the MPS design, was restarted during the year and is expected to be completed early in FY 1982. This design, together with shipyard working plans and technical purchase specifications for the MPS, would allow MARAD to begin rapid construction of cargo ships in the event of emergency mobilization.

In other areas of ship design during FY 1981, MARAD:

- Prepared studies on the conversion of several different types of existing cargo ships to a combination cargo/training ship for possible use by five State maritime academies.
- Began work on the preliminary design of a sail-assisted oceanographic research ship. The goal is a 75 percent fuel savings over an entirely engine-powered ship.
- Completed two separate studies involving the RO/RO trailer vessel, ATLANTIC BEAR, moored

in the James River Reserve Fleet. (The first study was a feasibility design study for its conversion into a Maritime Prepositioning Ship. The second study was an assessment of the present capability of the ATLANTIC BEAR to carry military tanks in a national emergency.)

- Prepared a study to prove the feasibility of placing cargo cranes and the SEA SHED system on board a typical container vessel to provide a cargo off-loading system for national defense uses. (SEA SHED is a cargo module which fits into the cell guides of a container-ship and effectively converts it to a 'tween deck, break bulk ship which can carry almost all military equipment. The cranes and SEA SHEDS would provide a particular vessel with the ability to carry general cargo and containerized cargo, to load or discharge cargo at pier side or at anchorage, and to off-load other cargo vessels.)

Shipyard Improvements

Despite a continuing worldwide shipping recession, uncertain near-term prospects, and declining commercial orderbooks, the American shipbuilding and ship repair industry invested \$190 million in facilities modernization and expansion during fiscal year 1981. Plans also were underway to spend an additional \$290 million in fiscal year 1982, mainly for larger drydocks and support facilities to increase vessel conversion, overhaul, and repair capabilities. Several yards also had

plans to prepare for an anticipated increase in naval ship construction.

Since enactment of the Merchant Marine Act of 1970, the U.S. shipbuilding and ship repair industry has invested approximately \$2.3 billion in plant modernization and improvements. These investments have significantly increased the capacity, capability, and productivity of the industry.

Disadvantaged Business/Women's Business Enterprise Program

In 1974, MARAD initiated a program to encourage shipping and shipbuilding firms to use minority suppliers and vendors. During 1981, the program was expanded to include all businesses determined to be disadvantaged under the guidelines of the Small Business

Administration. The promotion of women's business enterprise became a part of the program in 1979.

Subcontracting clauses which specifically address the utilization of minority and women-owned businesses are included in all construction-differential subsidy contracts. Agency representatives have been designated in the headquarters and in each of the Agency's regional offices to serve as a liaison between disadvantaged and women's businesses and the maritime industry.

Table 3: NEW SHIPS DELIVERED FROM U.S. SHIPYARDS DURING FY 1981

Owner	Builder	Type	Vessels
Subsidized			
Waterman Steamship Corp.	Avondale Shipyards	LASH Ship	1
American Atlantic Shipping, Inc.	Equitable Shipyards	Multi-Purpose Cargo	1
Farrell Lines, Inc.	Bethlehem-Sparrows Point	Containership	1
Asco-Falcon I Shipping Co.	Levingston SB	Dry-Bulk	1
Subsidiaries of Occidental Petroleum Corp.	Avondale Shipyards	Integrated Tug/Barge	3
Total Subsidized Deliveries			7
Nonsubsidized			
Sun Transport, Inc.	Sun Ship, Inc.	Product Tanker	2
Union Oil Co. of California	National Steel & SB	Product Tanker	2
Ogden Shamrock Transport, Inc.	Avondale Shipyards	Product Tanker	1
American Steamship Co.	Bay Shipbuilding	Bulk Carrier	1
Interlake Steamship Co.	American Ship Building	Bulk Carrier	1
Oglebay Norton Co.	Bay Shipbuilding	Bulk Carrier	1
Eagle Dredging Corp.	Avondale Shipyards	Self-Propelled Dredge	1
Corps of Engineers	Norfolk SB	Self-Propelled Dredge	1
Great Lakes Dredge & Dock Co.	Southern SB	Self-Propelled Dredge	1
Total Nonsubsidized Deliveries			11
Total New Ships Delivered FY 1981			18

Table 4: WORLDWIDE SHIP DELIVERIES—CALENDAR YEAR 1980 (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	600	12,825.6	3	3.1	341	3,829.3	101	3,464.9	155	5,528.3
United States	11	492.7	—	—	7	138.8	—	—	4	353.9
Brazil	21	947.0	—	—	7	111.5	10	507.4	4	328.1
Denmark	14	173.2	—	—	13	165.9	1	7.3	—	—
Finland	13	126.3	—	—	9	29.1	1	31.3	3	65.9
France	7	203.8	—	—	4	65.6	—	—	3	138.2
Germany (Fed. Republic)	24	224.8	1	1.2	19	202.7	—	—	4	20.9
Italy	11	263.2	—	—	7	99.1	1	100.0	3	64.1
Japan	269	6,858.8	1	1.0	124	1,591.9	45	1,513.2	99	3,752.7
Korea (Republic of)	27	514.8	—	—	18	193.6	7	283.3	2	37.9
Netherlands	11	68.9	—	—	9	64.9	—	—	2	4.0
Poland	13	202.9	—	—	11	130.4	2	72.5	—	—
Rumania	8	231.4	—	—	4	17.2	4	214.2	—	—
Spain	32	435.3	—	—	24	145.2	6	265.1	2	25.0
Sweden	12	349.1	—	—	6	51.8	1	3.0	5	294.3
U.S.S.R.	8	84.1	—	—	5	40.1	2	17.1	1	26.9
United Kingdom	38	451.1	—	—	24	262.9	7	110.9	7	77.3
Yugoslavia	15	145.7	—	—	15	145.7	—	—	—	—
All Others	66	1,052.5	1	.9	35	372.9	14	339.6	16	339.1

Table 5: SHIP FINANCING GUARANTEES—COMMITMENTS APPROVED IN FY 1981

Number	Type of Vessel	Company	Amount Guaranteed ¹
Deepdraft Vessels:			
1	Tanker	Ogden Clover Transport, Inc.	\$ 57,500,000
1	Tanker	Ogden Hudson Transport, Inc.	57,281,000
1	Bulk Carrier	Oglebay Norton Co.	50,310,000
1	Bulk Carrier	Cooper Steamship Co.	21,058,000
1	Bulk Carrier	Goodyear Steamship Co.	27,476,000
1 ²	Tanker	Pacific Shipping, Inc.	3,360,000
1 ²	Tanker	American Shipping, Inc.	3,360,000
1 ²	Tanker	Worth Oil Transportation, Inc.	3,376,000
1 ²	Tanker	Richmond Tankers	34,577,000
2	Tankers	Falcon I Sea Transport	56,770,000
1	RO/RO Trailership	Sun Leasing Co.	31,014,000
2 ²	OBOs	Aries Marine Shipping Co.	4,424,000
2 ²	Tankers	Aeron Marine Shipping Co.	5,184,000
1 ²	Tanker	Aquarius Marine Co.	2,673,000
1 ²	Tanker	Atlas Marine Co.	2,673,000
4 ²	Cargo	Moore McCormack Lines, Inc.	32,516,000
8	Total Deepdraft Vessels		\$393,552,000

Table 5: (Continued)

Number	Type of Vessel	Company	Amount Guaranteed ¹
Other Types:			
Ocean:			
1	Barge	Rain Associates	\$ 5,368,000
5	Barges	Trailer Marine Transport	24,269,000
2 ²	Barges	Mu-Petco Shipping Co.	3,416,000
1	Barge	Newpark Offshore Marine, Inc.	1,418,000
1	Tug	Gisclair Bros. Towing, Inc.	1,360,000
1	Barge	Ocean Barge Corp.	16,257,000
1	Barge	Beker Shipping Co.	22,677,000
1	Tug	General Marine, Inc.	\$ 2,297,500
1	Barge	General Marine, Inc.	1,880,500
1	Tug	Morania Barge No. 470, Inc.	2,000,000
1	Barge	Morania Barge No. 470, Inc.	2,000,000
1	Barge	Universal American Barge Corp.	16,047,000
1 ²	Barge	Allied Barge, Inc.	1,626,000
1	Tug	Beker Shipping Co.	7,032,000
2	Tugs	Dotco One, Inc.	2,777,000
1	Barge	Dotco One, Inc.	2,640,000
2	Barges	Hannah Marine Corp.	8,745,000
21		Total Ocean	\$121,810,000
Other Types:			
River:			
3	Tugs	Parker Towing Co.	\$ 1,366,759
39	Barges	Parker Towing Co.	8,992,241
1	Tug	Riverway Co.	577,000
50	Barges	Riverway Co.	11,838,000
1	Barge	O.L. Schmidt Barge Lines, Inc.	1,426,000
5	Tugs	National Marine Service, Inc.	4,605,500
46	Barges	National Marine Service, Inc.	28,119,500
50	Barges	Waterways Barge Partnership	12,116,000
2	Barges	K.A. Steel Chemicals, Inc.	1,473,000
15	Barges	Shearson River Barge Associates III	3,611,000
2	Barges	Ingram Towing Co.	5,738,000
15	Barges	Shearson River Barge Associates IV	3,637,000
15	Barges	Shearson River Barge Associates V	3,627,000
3	Barges	Beker Transportation Co.	\$ 2,500,000
7	Barges	Rio Marine, Inc.	7,721,000
25	Barges	I.S. Joseph Barge Co.	5,473,000
15	Barges	Shearson River Barge Associates VII	3,551,000
60	Barges	ML Barge Pool III Partners	12,000,000
6	Barges	Grasso Barge & Transport, Inc.	5,400,000
4	Barges	Marquette Co.	10,277,000
2	Tugs	Parker Towing Co.	2,272,000
1	Tug	Wisconsin Barge Lines, Inc.	3,800,500
68	Barges	Wisconsin Barge Lines, Inc.	18,318,500
20	Barges	Shearson River Barge Associates I	4,141,000
5	Barges	Weber Marine, Inc. A Partnership in Commendam	1,342,000
460		Total River	\$163,923,000

(Continued on page 10)

Table 5: (Continued)

Number	Type of Vessel	Company	Amount Guaranteed ¹
Drill Service:			
6	Tug/Supply Vessels	Petromar Marine, Ltd.	\$ 22,469,000
1	Tug/Supply Vessel	Billy Pugh Offshore, Ltd.—1980	2,221,844
2	Crew/Utility Vessels	Billy Pugh Offshore, Ltd.—1980	2,154,156
3	Tug/Supply Vessels	Point Express, Ltd.	9,070,529
6	Tug/Supply Vessels	D.F. Levy Marine Limited I	17,692,000
1	Tug/Supply Vessel	Offshore Ship Services, Inc.	2,800,000
3	Tug/Supply Vessels	Garber Bros., Inc.	6,182,000
4	Tug/Supply Vessels	Marsea Marine Seven-Ten, Inc.	13,440,000
1	Tug/Supply Vessel	Moody Offshore, Inc.	2,054,000
6	Tug/Supply Vessels	Marsea Marine Eleven-Seventee, Inc.	19,640,800
3	Tug/Supply Vessels	Linden, Inc.	7,929,000
2	Towing Supply Vessels	Sea Level International, Inc.	6,717,000
38		Total Drill Service	\$112,370,329
Drill Ships:			
1	Jack-up Drilling Rig	Gulfdrill Limited I	\$ 17,193,000
1	Jack-up Drilling Barge	Houston Offshore Ltd. IV	21,607,000
1	Drilling Barge	Glendel Limited I	5,494,000
1	Posted Drilling Barge	Merit Three Drilling, Ltd.	7,250,000
4	Workover/Drilling Barges	Mardrill, Inc.	11,690,000
1	Posted Drilling Rig	Glendel Limited II	6,835,000
2	Posted Drilling Barges	Blocker Marine Ltd. I	17,382,000
2	Jack-up Workover/ Drilling Vessels	Houtech Limited I	20,600,000
2	Jack-up Drilling Rigs	G & A Limited I	40,370,000
1	Jack-up Drilling Rig	Keyes Offshore, Ltd. V	26,300,000
1	Jack-up Drilling Rig	Temple Drilling Co.	24,472,000
1	Jack-up Drilling Rig	Huthnance Drilling Co./Charger I Ltd.	18,892,000
1	Jack-up Drilling Rig	G & A Limited II	23,700,000
19		Total Drill Ships	\$241,785,000
Miscellaneous:			
2	Dredges	Beker Maritime Co.	\$ 8,200,000
1	Pipelay/Bury Derrick Barge	Pipelines, Inc. of Harvey	3,836,000
1	Research Vessel	Western Pioneer, Inc.	1,820,000
4		Total Miscellaneous	\$ 13,856,000
Lighters:			
		None	
550		Total Vessels	\$1,047,296,329

¹ Note: Some numbers have been rounded.² Note: Not included in ship count; involved second mortgage.

Table 6: FEDERAL SHIP FINANCING GUARANTEES (TITLE XI) PROGRAM SUMMARY
(Statutory Limit \$9.5 Billion) Principal Liability on September 30, 1981

Vessel Types	Contracts in Force		Applications Pending	
	Vessels Covered	Principal Amount*	Vessels Covered	Principal Amount*
Deepdraft Vessels:				
Tankers	82	\$2,043,643,779	25	\$ 736,136,500
Cargos	145	1,193,156,750	4	69,987,000
LNGs	16	1,322,350,400	0 ¹	¹
Bulk/OBOs	21	414,064,778	2	71,425,000
Total	264	\$4,973,215,707	31	\$ 877,548,500
Other Types:				
Drill Rigs/Ships	84	\$1,111,602,516	¹	¹
Tugs/Barges/Drill Service	2,949	1,602,072,935	2,000	1,038,621,313
Miscellaneous	16	170,955,133	11	138,515,125
Total	3,049	\$2,884,630,584	2,011	\$1,177,136,438
Total Vessels	3,313	\$7,857,846,291	2,042	\$2,054,684,938
Shipboard Lighters	2,118	\$ 77,790,684	409	\$ 6,571,000
Total	5,431	\$7,935,636,975	2,451	\$2,061,255,938

* Rounded to the nearest dollar.

¹ The end-of-year backlog also included proposed financing of 8 LNGs and 48 drilling vessels totaling some \$2.2 billion. (See text.)



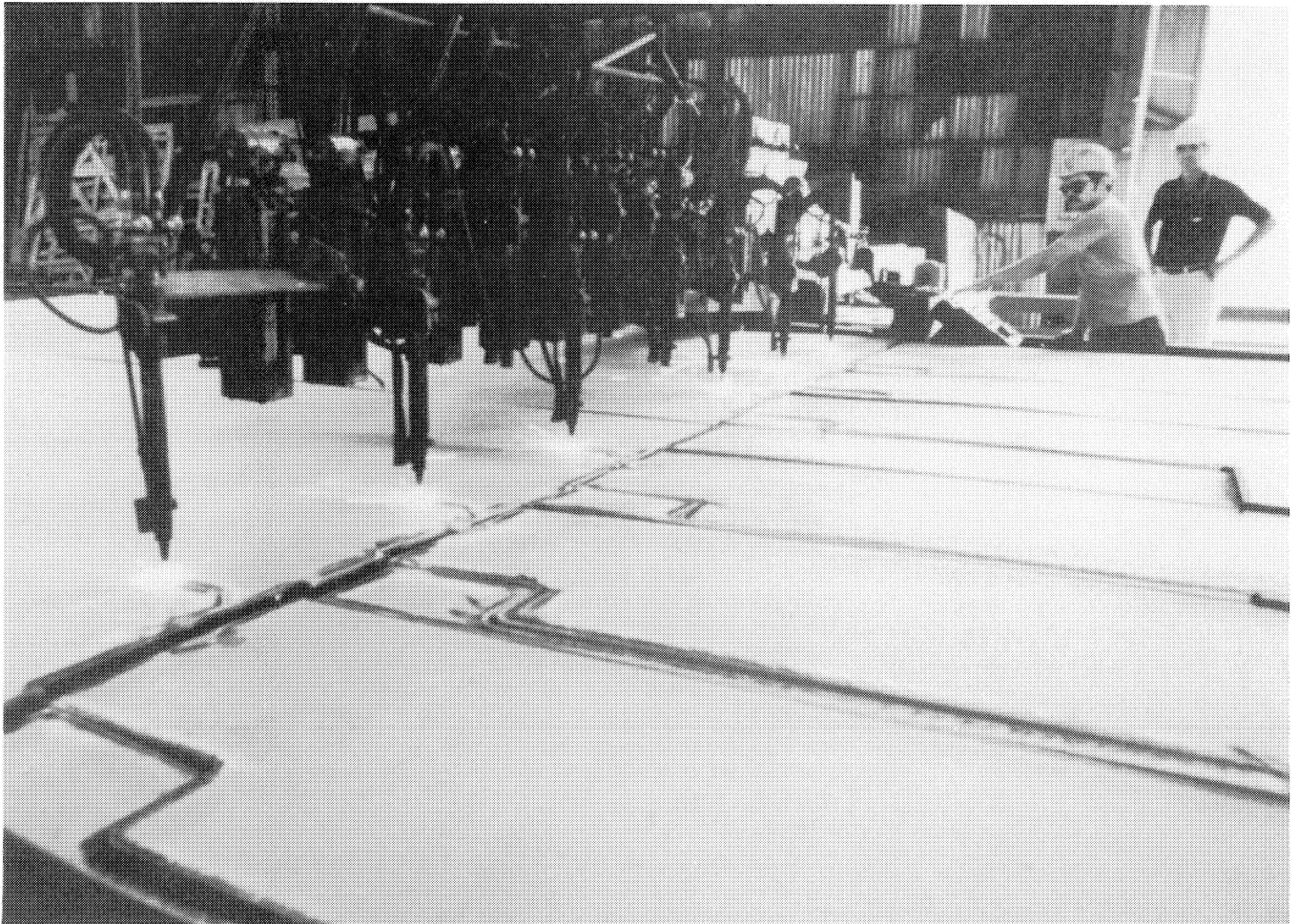
MV PRESIDENT LINCOLN, christened and launched at Avondale Shipyards, New Orleans, La., ushers in new era at American President Lines. With 2,500 twenty-foot-equivalent unit (TEU) container capacity, vessel—and two sister ships—will be largest containerships ever built in the United States.

Table 7: CAPITAL CONSTRUCTION FUND HOLDERS—SEPTEMBER 30, 1981

A & G Corp.	Durocher Dock & Dredge, Inc.	Mount Washington Tanker Co.
Aeron Marine Shipping Co.	El Paso Arzew Tanker Co.	Montpelier Tanker Co.
Alaska Aggregate Corp.	El Paso Howard Boyd Tanker Co.	National Gypsum Co.
Alaska Riverways, Inc.	El Paso Southern Tanker Co.	National Marine Service, Inc.
Amak Towing Co., Inc.	Exxon Corp.	Neuman Boat Line, Inc.
American Atlantic Shipping, Inc.	Farrell Lines, Inc.	O.L. Schmidt Barge Lines, Inc.
American President Lines, Ltd.	Ford Motor Co.	Ogden Corp.
American Shipping, Inc.	Foss Alaska Lines, Inc.	Oglebay Norton Co.
Aquarius Marine Co.	Foss Launch and Tug Co.	Ohio Barge Line, Inc.
Ashland Oil, Inc.	Fred Devine Diving & Salvage, Inc.	Overseas Bulk Tank Corp.
Atlantic Marine Industries, Inc.	GATX Corp.	Pacific Shipping, Inc.
Atlantic Richfield Co.	General Electric Credit and Leasing Corp.	Prince William Navigation Co.
Atlas Marine Co.	General Electric Credit Corp. of Delaware	Prudential Lines, Inc.
Bankers Trust New York Corp.	General Electric Credit Corp. of Georgia	Reynolds Leasing Corp.
Barge Bandon, Inc.	Graham Boats, Inc.	Ritchie Transportation Co.
Bethlehem Steel Corp.	Great Lakes Towing Co.	River & Gulf Transportation Co.
Blue Lines, Inc.	Hannah Brothers	S & E Shipping Corp.
Bultema Dock and Dredge Co.	Hannah Marine Corp.	Seabulk Tankers, Inc.
Bultema Marine Transportation, Inc.	Houston Natural Gas Corp.	Sea Savage, Inc.
Cambridge Tankers, Inc.	Hvide Shipping, Inc.	Smith Lighterage Co., Inc.
Campbell Towing Co.	Inland Steel Co.	Sun Company, Inc.
Cement Transit Co./Medusa Corp.	Intercontinental Bulk Tank Corp.	Tidewater, Inc.
Central Gulf Lines, Inc.	Interstate Marine Transport Co.	Transway International Corp.
Citimarlease (Burmah I), Inc.	Interstate Towing Co.	Tug Alaska Mariner, Inc.
Citimarlease (Burmah LNG Carrier), Inc.	Luedtke Engineering Co.	Tug Wasp, Inc.
Citimarlease (Burmah Liquegas), Inc.	Lykes Bros. Steamship Co., Inc.	Union Oil Co. of California
Citimarlease (Fulton), Inc.	Madeline Island Ferry Line, Inc.	United States Cruises, Inc.
Citimarlease (Whitney), Inc.	Marine Leasing Corp.	United States Lines, Inc.
Cleveland-Cliffs Iron Co.	Matson Navigation Co.	United States Steel Corp.
Cook Inlet Tug & Barge Co.	Middle Rock, Inc.	Warrior & Gulf Navigation Co.
Cove Maritime Companies, Inc.	Monticello Tanker Co.	Waterman Steamship Corp.
Crowley Maritime Corp.	Moore McCormack Resources, Inc.	Western Pioneer, Inc.
CSI Hydrostatic Testers, Inc.	Mount Vernon Tanker Co.	Windjammer Cruises, Inc.
Delta Steamship Lines, Inc.		Worth Oil Transport Co.
Dillingham Tug & Barge Corp.		Young Brothers, Ltd.
		Zidell, Inc.

Table 8: CONSTRUCTION RESERVE FUNDS—SEPTEMBER 30, 1981

Company	Balance
Cargo Carriers, Inc.	\$1,675,000
Central Gulf Steamship Corp.	1,000
Gulf Mississippi Marine Corp.	100
Ingram Industries, Inc.	85,000
Joan Turecamo, Inc.	3,876
Lee-Vac, Ltd.	650,000
Mobil Oil Corp.	3,283,438
National Marine Service, Inc.	1,145,300
Total September 30, 1981	\$6,843,714
Net Decrease Fiscal Year 1981	\$8,663,628



Automated burning machines cut zinc-coated steel plate into sections—some more than 40 feet long—at Jeffboat, Inc., shipyard, Jeffersonville, Ind.

Ship Operations

U.S. Fleet Profile

At the end of fiscal year 1981, the U.S.-flag, privately owned, deep-draft merchant fleet (including the Great Lakes fleet listed in Table 18) totaled 725 vessels with a record cargo-carrying capacity of 24.6 million deadweight tons (dwt.).

This total included 581 oceangoing ships of 21.6 million dwt. (see Table 9), with 522 ships on active status and 59 inactive. The fleet composite averaged 37,110 dwt., an age of 17.5 years, and a speed of about 18 knots.

The active oceangoing fleet, totaling 18.4 million dwt., included 97 freighters, 249 tankers, 14 bulk carriers, 139 intermodal vessels (containerships, barge-carrying vessels, and Roll-On/Roll-Off or RO/RO vanships), 5 combination passenger-cargo ships, 11 integrated tug-barge vessels, and 7 liquefied natural gas (LNG) tankers.

Of the 59 vessels in inactive status, 33 were temporarily inactive, either awaiting cargoes or undergoing repairs, and 26 were laid up.

Employment of the U.S.-flag oceangoing merchant fleet as of September 30, 1981, is shown in Table 10.

In world fleet rankings as of January 1, 1981, the privately owned U.S. fleet placed eighth on a dwt. basis and eleventh on the basis of number of ships (see Table 11).

In calendar year 1980, commercial cargoes carried by ships of all flags in the U.S. oceanborne foreign trade totaled 772.2 million tons, the lowest tonnage level since 1976.

The U.S.-flag tonnage and share of the total tonnage also declined.

Commercial cargoes carried in U.S. oceanborne foreign trade from 1971 through 1980 are shown in Table 12.

Operating-Differential Subsidy

U.S.-flag vessels which operate in an essential foreign trade are eligible for operating-differential subsidy (ODS). This subsidy, which is administered by the Maritime Administration (MARAD), is designed to offset the lower ship operating costs of foreign-flag competitors. Total subsidy outlays during fiscal year 1981 amounted to \$334.9 million.

Subsidy of approximately \$2.5 million was paid to one liner company for voyages in the Great Lakes trade in calendar year 1981.

ODS accruals and expenditures from January 1, 1937, through September 30, 1981, are summarized in Table 13, while accruals and outlays by shipping lines for the same period are shown in Table 14.

At the end of this reporting period, 22 operators (8 liner and 14 bulk) held 26 ODS contracts with MARAD and operated 165 subsidized vessels (see Table 15).

New Section 614

The Omnibus Budget Reconciliation Act of 1981 amended the Merchant Marine Act of 1936 by adding a new Section 614. This new section provides that a subsidized operator, subject to certain conditions, may elect to suspend its ODS agreement for a period of not less than 12 months for all or a portion of its vessels which are less than 10 years old.

Prior to the end of FY 1981, Equity Carriers I, Inc., elected to suspend its ODS agreement with respect to the PRIDE OF TEXAS, a 32,100-dwt. dry-bulk carrier.

Corporate/Service Changes

During FY 1981, major rearrangements of corporate structures and/or services were made by four

ODS contractors (three liner companies and one bulk operator).

Delta Steamship Lines, Inc., was restructured by the distribution of all its stock from TCO Industries, Inc., to Holiday Inns, Inc.

Farrell Lines, Inc., sold its rights to subsidized operation on Trade Routes (TRs) 5-7-8-9 to United States Lines, Inc.

Waterman Steamship Corp. was restructured through distribution of 50 percent of its parent's stock, Waterman Marine Corp., owned by Transway International Corp., to Transway's shareholders.

Zapata Leasing Corp. sold four tankers, formerly operated by Zapata Product Tankers, Inc., to four subsidiaries of Ogden Product Tankers, Inc. Ogden's subsidiaries bareboat chartered the vessels to Ocean Carriers, Inc., the new ODS operator, which, in turn, time-chartered the vessels to Ogden Bulk Transport, Inc.

In addition, Titan Navigation, Inc., was engaged as managing agent to operate the new dry-bulk carrier MV PRIDE OF TEXAS in the worldwide bulk trades under Equity Carriers I, Inc.'s ODS contract.

Contract Awards

New long-term ODS contracts were awarded during FY 1981 to United States Lines, Inc., and Farrell Lines, Inc. United States Lines was awarded a 20-year agreement for four vessels on TRs 5-7-8-9 (U.S. North Atlantic/Western Europe) and Farrell was awarded a 20-year agreement for eight vessels on TRs 10, 13, and 18 (U.S. Atlantic/Mediterranean-India).

Pending Applications

Two ODS applications from non-subsidized operators were actively pending on September 30, 1981:

- Phoenix Bulk Ship, I, II & III, Inc.—to provide worldwide bulk service.

Table 9: U.S. OCEANGOING MERCHANT MARINE—SEPTEMBER 30, 1981¹

	Privately Owned		Government Owned		Total	
	Ships	Deadweight Tons (000)	Ships	Deadweight Tons (000)	Ships	Deadweight Tons (000)
Active Fleet:						
Combo Passenger/Cargo	5	45	5	39	10	84
Freighters	97	1,316	9	67	106	1,383
Bulk Carriers	14	471	0	0	14	471
Tankers	249	12,781	2	21	251	12,802
Intermodal	139	2,957	1	22	140	2,979
Tug/Barge	11	342	0	0	11	342
LNG	7	500	0	0	7	500
Total Active Fleet	522	18,412	17	149	539	18,561
Inactive Fleet:						
Combo Passenger/Cargo	2	13	52	334	54	347
Freighters	13	158	190	2,070	203	2,229
Bulk Carriers	3	71	0	0	3	71
Tankers	24	2,261	16	257	40	2,518
Intermodal	10	177	7	106	17	283
Tug/Barge	1	41	0	0	1	41
LNG	6	428	0	0	6	428
Total Inactive Fleet	59	3,149	265²	2,767	324	5,916
Total Active and Inactive:						
Combo Passenger/Cargo	7	57	57	373	64	430
Freighters	110	1,474	199	2,138	309	3,612
Bulk Carriers	17	542	0	0	17	542
Tankers	273	15,042	18	278	291	15,319
Intermodal	149	3,134	8	128	157	3,262
Tug/Barge	12	383	0	0	12	303
LNG	13	928	0	0	13	920
Total American Flag	581	21,561	282³	2,916	863	24,477

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

² Includes 2 vessels in bareboat charter and 16 vessels in custody of other agencies.

³ National Defense Reserve Fleet consists of 262 ships, of which 25 are scrap candidates other than NDRF. Excluded are 64 vessels owned by U.S. Navy which are in custody of MARAD's Reserve Fleet.

NOTE: Tonnage figures may not add due to rounding.

- American Heavy Lift Shipping Co.—to provide worldwide dry-bulk service.

Seven liner companies with existing ODS contracts had applications pending for either additional sailings under existing contracts or new contracts for other service, as follows:

- American President Lines, Ltd.—for amendment of its ODS agreement to (1) permit the loading of U.S. cargo on its Per-

sian Gulf-Gulf of Oman on Line A extension service (California/Far East-South Asia-Persian Gulf), and (2) authorize vessels operating on Line B service (U.S. Pacific-Northwest/Far East) to carry cargo between Washington-Oregon and Guam.

- Delta Steamship Lines, Inc.—for amendment of the contractual service descriptions of TR 2 (U.S. Atlantic/West Coast South America) and TR 4 (U.S. Atlan-

tic/Caribbean). (The proposed change would combine the total annual sailings at ports in the Caribbean Islands, Mexico, East Coast of Central America, and the North Coast of South America, and allow ships on either trade route to call at these ports as long as the combined total annual sailings do not exceed 95. Delta also requested an amendment of the contractual service description of TR 4 in order to allow the carriage of cargoes between U.S.

Atlantic ports south of Jacksonville, Fla., and Central America.)

- Farrell Lines, Inc.—to increase annual sailings from 22 to 30 on its TR 18 service (U.S. Atlantic-Gulf/Red Sea, India, Persian Gulf, Mediterranean).
- Lykes Bros. Steamship Co., Inc.—for privilege service from the U.S. Gulf to Panama in conjunction with its TR 15-B services and for

an increase in sailings on its TR 31 service to 48 annually, plus the establishment of a Caribbean subservice. Lykes has pending a request for a new TR 18 service with a maximum of 36 annual sailings with the privilege of providing service on TR 10 (U.S. North Atlantic/Mediterranean).

- Prudential Lines, Inc.—for a long-term contract for services

between U.S. Atlantic and Gulf ports and ports in India, the Persian Gulf, and Red Sea (TR 18), with the privilege of providing service on TR 13 between the U.S. Gulf and the North Coast of Africa.

- Waterman Steamship Corp.—for an increase in annual sailings from 40 to 70 on its TR 18 service (U.S. Atlantic-Gulf/India,

Table 10: EMPLOYMENT OF U.S.-FLAG OCEANGOING FLEET—SEPTEMBER 30, 1981¹

Status and Area of Employment	Vessel Type							
	Total		Combination Pass./Cargo		Freighters		Tankers ²	
	No.	Deadweight Tons (000)	No.	Deadweight Tons (000)	No.	Deadweight Tons (000)	No.	Deadweight Tons (000)
Grand Total	863	24,477	64	430	486	7,489	313	16,558
Active Vessels:	539	18,561	10	84	263	4,906	266	13,571
Foreign Trade	197	4,375	4	37	169	3,318	24	1,020
Nearby Foreign ³	14	326	0	0	7	73	7	253
Great Lakes-Seaway Foreign	4	72	0	0	3	43	1	29
Overseas Foreign	179	3,977	4	37	159	3,202	16	738
Foreign to Foreign	19	766	0	0	11	175	8	591
Domestic Trade	235	10,951	1	8	39	659	195	10,284
Coastwise	98	2,884	0	0	11	216	87	2,668
Intercoastal	66	3,836	0	0	2	27	64	3,809
Noncontiguous	71	4,231	1	8	26	416	44	3,807
Other U.S. Agency Operations	88	2,469	5	39	44	754	39	1,676
MSC Charter	71	2,320	0	0	34	665	37	1,655
Bareboat Charter & Other Custody	17	149	5	39	10	89	2	21
Inactive Vessels	324	5,916	54	346	223	2,583	47	2,987
Temporarily Inactive	33	1,629	0	0	13	185	20	1,444
Laid-Up (Privately Owned)	25	1,504	2	13	12	205	11	1,286
Laid-Up (MarAd-Owned/ Pending Disposition ⁴)	12	154	1	10	10	126	1	18
National Defense Reserve Fleet ⁵	254	2,629	51	323	188	2,067	15	239

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

² Includes 17 dry-bulk vessels.

³ Nearby foreign trade includes Canada, Mexico, Central America, West Indies, and North Coast of South America.

⁴ Other than vessels in the National Defense Reserve Fleet.

⁵ Includes 1 vessel of Pacific Far East Line, Inc.

Persian Gulf, Red Sea). Waterman has requested privilege service on three segments of its TR 18 service (Great Lakes/Africa, Red Sea, Persian Gulf, and India; South and East Africa; and Mediterranean Egypt) and the addition of two or three vessels to provide its existing TR 18 service as well as the additional privilege service requested.

- United States Lines, Inc.—for a long-term contract for service between U.S. North and South Atlantic ports and ports in Western Europe (TR 5-7-8-9/11) and between Atlantic and Pacific ports and ports in the Far East (TR 12/29).

Subsidy Rates

The Subsidy Index System prescribed by the Merchant Marine Act of 1970 provides for the payment of seafaring wage subsidies in

per diem amounts. The rate of change in the index, computed annually by the Bureau of Labor Statistics, is used as the measure of change in seafaring employment costs.

The Maritime Subsidy Board establishes tentative wage subsidy rates within 90 days of the beginning of each fiscal year for which such rates are to be effective. Tentative rates for FY 1982 were completed in September 1981.

MARAD substantially completed all final 1978 subsidy rates applicable to liner and passenger vessels.

In addition to the wage category, ODS rates are calculated for the items of subsistence (passenger vessels only), maintenance and repairs, hull and machinery insurance, and protection and indemnity insurance for both premium and deductible.

All final wage subsidy rates for bulk operators from 1973 through 1978 have been completed. These

final rates were the first to be concluded under the bulk subsidy program.

In the Soviet Grain Program, final rates have been completed for 321 of the 327 subsidized voyages by U.S.-flag vessels since the inception of the program in FY 1973.

Soviet Grain ODS

Effective January 1, 1976, the United States and the U.S.S.R. became parties to a 6-year maritime agreement which facilitated U.S.-flag participation in bilateral trade between the two nations, including the carriage of grain exports to the Soviet Union. This agreement succeeded a 3-year pact signed in October 1972.

Since the signing of the first agreement, the Soviet Union has purchased more than 95.6 million metric tons of American grain. U.S.-flag ships have carried 12.8

Table 11: MAJOR MERCHANT FLEETS OF THE WORLD—JANUARY 1, 1981

Country	No. of Ships ¹	Rank by No. of Ships ²	Deadweight Tons	Rank by Deadweight Tonnage
Liberia	2,271	4	153,342,000	1
Greece	2,928	1	69,559,000	2
Japan	1,762	5	62,001,000	3
United Kingdom	1,056	6	42,302,000	4
Norway	616	10	38,575,000	5
Panama	2,437	3	38,011,000	6
U.S.S.R.	2,530	2	21,757,000	7
United States (Privately Owned)	578	11	21,103,000	8
France	345	18	19,539,000	9
Italy	622	8	17,269,000	10
Spain	509	12	12,235,000	11
Germany (Federal Republic of)	473	13	11,863,000	12
Singapore	622	9	11,754,000	13
China (People's Republic of)	695	7	10,129,000	14
India	370	17	9,221,000	15
All Others ³	7,053		116,249,000	
Total	24,867		654,909,000	

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

² By number of ships, Netherlands ranked 14th with 444 vessels aggregating 8,300,000 dwt. tons, Cyprus ranked 15th with 395 vessels aggregating 2,507,000 dwt. tons, and Korea (Republic of) ranked 16th with 385 vessels aggregating 6,285,000 dwt. tons.

³ Includes 286 United States Government-owned ships of 2,987,000 dwt. tons.

million tons of that total (13.5 percent) and U.S.S.R.-flag vessels have carried 16.7 million tons (17.4 percent).

The exported grain was carried under a 5-year grain agreement which became effective October 1, 1976. (This agreement has been extended for an additional year pending negotiations on the maritime agreement.)

The grain agreement calls for the Soviet Union to purchase at least 6 million metric tons of grain each year from U.S. suppliers with the option, within certain guidelines, of increasing these purchases to 8 million metric tons per year. Purchases beyond that level require U.S. Government approval. On April 24, 1981, the President cancelled an embargo on trade with the Soviet Union. By the end of FY 1981, the Soviet Union had been granted permission to purchase 18 million tons of U.S. grain between October 1981 and September 1982. The Department of Agriculture stood ready to offer 23 million tons.

As of September 30, 1981, 24 U.S.-flag operators held short-term ODS contracts covering 31 vessels for the carriage of agricultural commodities from U.S. ports to the Soviet Union (see Table 16).

Subsidy outlays during FY 1981 for voyages in previous years under the special Soviet grain agreements totaled \$316,423 (see Table 13).

Since the program was begun in FY 1973, U.S. operators have accrued \$146.4 million in ODS. Of this accrual, \$144 million has been paid, leaving an estimated unpaid balance of \$2.4 million at the end of the fiscal year.

Grain Freight Rates

A U.S.-U.S.S.R. conference to discuss the fifth year of the grain agreement was held in Washington, D.C., in December 1980. It did not substantively change the U.S.-flag freight rate mechanism.

The U.S.-U.S.S.R. freight rate agreement for U.S.-flag vessels, in effect for grain voyages started after December 31, 1980, and continuing through December 30, 1981, provided for a charter rate to be determined monthly. The rate was calculated by multiplying an index ratio by the monthly average charter rate for the U.S. Gulf/Holland-Belgium grain trade, as published in the *Daily Freight Register*. In addition, a minimum rate of \$25 per metric ton was set for voyages by U.S.-flag vessels during calendar year 1981.

Rates calculated during the year ranged from a high of \$38 per metric ton in January to the minimum of \$25 from July through December. However, no U.S.-flag vessels were chartered in the U.S.-U.S.S.R. grain trade during FY 1981.

Soviet Grain ODS Awards

During FY 1981, no new short-term contracts were awarded under the Soviet grain program. Six existing operators with a total of six ships terminated their contracts.

Fiscal year 1981 marked 25th anniversary of containerization. IDEAL-X, converted T-2 tanker, inaugurated first trailership service out of Port Newark, N.J., on April 26, 1956, carrying 56 containers on specially constructed spar deck to Houston, Tex. Vessel was operated by Pan-Atlantic Steamship Corp., forerunner of Sea-Land Industries, Inc.



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

Tonnage (Millions)

Calendar Year	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Total Tons	457.4	513.6	631.6	628.9	615.6	698.8	775.3	775.6	823.1	772.2
U.S.-Flag Tons	24.4	23.8	39.9	40.9	31.4	33.8	34.8	32.1	35.0	28.2
U.S. Percent of Total	5.3	4.6	6.3	6.5	5.1	4.8	4.5	4.1	4.2	3.7
Liner Total Tons	44.2	44.6	51.3	51.4	44.3	49.8	47.8	56.5	57.0	59.3
Liner U.S.-Flag Tons	10.1	9.8	13.2	15.3	13.6	15.4	14.4	16.0	15.7	16.2
Liner U.S. Percent	22.9	21.9	25.8	29.8	30.7	30.9	30.2	28.3	27.5	27.3
Non-Liner Total Tons	220.7	242.6	281.9	282.7	275.3	289.6	289.0	308.8	342.7	356.7
Non-Liner U.S.-Flag Tons	4.8	3.8	4.5	5.0	3.8	4.9	5.7	4.5	3.6	4.1
Non-Liner U.S. Percent	2.1	1.6	1.6	1.8	1.4	1.7	2.0	1.5	1.0	1.2
Tanker Total Tons	192.5	226.4	298.4	294.8	296.0	359.4	438.6	410.3	423.4	356.3
Tanker U.S.-Flag Tons	9.5	10.2	22.2	20.5	14.0	13.6	14.6	11.6	15.7	7.9
Tanker U.S. Percent	4.9	4.5	7.4	7.0	4.7	3.8	3.3	2.8	3.7	2.2
Value (\$ Billions)										
Total Value	50.4	60.5	84.0	124.2	127.5	148.4	171.2	195.8	242.1	294.3
U.S.-Flag Value	9.9	11.1	15.9	22.0	22.4	26.4	28.0	30.7	35.7	42.3
U.S. Percent of Total	19.6	18.4	18.9	17.7	17.5	17.8	16.4	15.7	14.7	14.4
Liner Total Value	32.4	37.4	49.6	63.4	64.0	75.8	82.3	99.9	117.6	136.9
Liner U.S.-Flag Value	9.2	10.3	14.4	19.4	20.0	23.9	25.2	28.6	32.5	39.2
Liner U.S. Percent	28.4	27.7	29.1	30.6	31.2	31.6	30.7	28.6	27.6	28.7
Non-Liner Total Value	13.2	17.4	25.2	34.7	36.6	38.2	42.7	52.5	62.0	74.1
Non-Liner U.S.-Flag Value	.4	.4	.7	.8	1.0	1.1	1.2	1.0	1.1	1.3
Non-Liner U.S. Percent	3.1	2.4	2.5	2.3	2.8	2.8	2.8	1.8	1.7	1.8
Tanker Total Value	4.9	5.7	9.2	26.0	26.9	34.4	46.2	43.4	62.5	83.3
Tanker U.S.-Flag Value	.3	.4	.8	1.8	1.4	1.4	1.6	1.1	2.1	1.8
Tanker U.S. Percent	5.5	6.2	9.1	6.9	5.1	4.2	3.5	2.7	3.4	2.1

Note: Table includes Government-sponsored cargo; excludes Department of Defense and U.S./Canada translake cargoes.

China Maritime Agreement

The United States and the People's Republic of China (PRC) signed an Agreement on Maritime Transport in September 1980. One year later a Chinese delegation came to Washington, D.C., to discuss progress, problems, and interim developments under the agreement. There were no changes to the U.S.-PRC agreement as a result of this meeting (see Chapter 10).

During the first 11 months of the U.S.-PRC maritime agreement, the

Chinese bought and shipped 7.564 million tons of U.S. grain, mostly wheat. Of the total grain purchases, U.S.-flag vessels carried 34,475 tons (.5 percent), Chinese-flag vessels carried 1.380 million tons (18.2 percent) and third-flag vessels carried the remaining 6.150 million tons (81.3 percent).

Trade-Ins

During FY 1981, one subsidized operator, Farrell Lines, Inc., traded in seven vessels against new construction, under Section 510 of the Merchant Marine Act of 1936, as

amended. The ships—three C5 and four C4 vessels—were in addition to five C4 and three C3 vessels previously traded in against the purchase price of the AUSTRAL PURITAN and AUSTRAL PIONEER. The traded-in vessels were operated under a use-hire agreement until they were delivered to the National Defense Reserve Fleet.

Passenger Service

During the fiscal year, United States Cruises, Inc., of Seattle, Wash., completed payment for the SS UNITED STATES which the firm

purchased from the Government in September 1978 for \$5 million. (A Title XI application to assist in conversion of the vessel for cruise service was pending.)

In October 1980, MARAD published a study, conducted for the Agency by Centaur Associates, Inc., titled, *Analysis of the North American Cruise Industry*. This report was commissioned to provide information to assist American-flag companies to develop successful cruise operations.

As of September 30, 1981, U.S.-flag oceangoing passenger service was provided by the OCEANIC INDEPENDENCE, operated by American Hawaii Cruises, Inc., of San Francisco, Calif., in addition to four

passenger/cargo vessels operated by Delta Steamship Lines, Inc. The OCEANIC INDEPENDENCE began service in June 1980. The Delta ships—SSs SANTA MAGDALENA, SANTA MARIA, SANTA MARIANA, and SANTA MERCEDES—offer 22 voyages a year with up to 100 berths per voyage. They depart from the West Coast and circumnavigate South America.

Limited accommodations aboard cargo ships for up to 12 passengers per vessel were available from six U.S.-flag liner operators: Farrell Lines, Inc.; Moore McCormack Lines, Inc.; Lykes Bros. Steamship Co., Inc.; Prudential Lines, Inc.; American President Lines, Ltd.; and Delta Steamship Lines, Inc.

In this reporting period, legislation was introduced to permit the OCEANIC CONSTITUTION, the former CONSTITUTION and sister ship to the OCEANIC INDEPENDENCE, to enter the U.S. domestic trade. The bill (H.R. 3782) would allow the domestic employment of the ship notwithstanding foreign renovation prior to entry into service.

On the inland waterways, two traditionally styled steamboats provided cruise service on the Mississippi and Ohio Rivers.

Also in the domestic trade, an extensive ferry service links Alaskan ports and Seattle, Wash.

Two other operators offering local service with U.S.-flag vessels,

Table 13: ODS ACCRUALS AND OUTLAYS—JANUARY 1, 1937, TO SEPTEMBER 30, 1981

Calendar Year of Operation	Accruals			Outlays		
	Subsidies	Recapture	Subsidy Accrual	In FY 1981	Total Amount of Net Accrual Paid	Net Accrual Liability
1937–1955	\$ 682,457,954	\$157,632,946	\$ 524,825,008	–0–	\$ 524,825,008	–0–
1956–1960	751,430,098	63,755,409	687,674,689	–0–	687,674,689	–0–
1961	170,884,261	2,042,748	168,841,513	–0–	168,841,513	–0–
1962	179,727,400	4,929,404	174,797,996	–0–	174,467,393	330,603
1963	189,119,876	(1,415,917)	190,535,793	–0–	190,535,793	–0–
1964	220,334,818	674,506	219,660,312	–0–	219,660,312	–0–
1965	183,913,236	1,014,005	182,899,231	–0–	182,899,231	–0–
1966	202,734,069	3,229,471	199,504,598	–0–	199,504,598	–0–
1967	220,579,702	5,162,831	215,416,871	–0–	215,416,871	–0–
1968	222,862,970	3,673,790	219,189,180	–0–	219,189,180	–0–
1969	233,201,233	2,217,144	230,984,089	–0–	228,038,947	2,945,142
1970	232,686,761	(1,908,643)	234,595,404	–0–	234,449,812	145,592
1971	203,401,051	(2,821,259)	206,222,310	–0–	205,261,360	960,950
1972	192,512,930	–0–	192,512,930	–0–	190,732,158	1,780,772
1973	219,569,907	–0–	219,569,907	–0–	219,468,476	101,431
1974	220,912,243	–0–	220,912,243	427,844	218,982,010	1,930,233
1975	261,806,899	–0–	261,806,899	830,625	259,445,924	2,360,975
1976	281,947,153	–0–	281,947,153	3,956,444	272,993,888	8,953,265
1977	300,713,310	–0–	300,713,310	1,227,775	289,593,256	11,120,054
1978	287,579,374	–0–	287,579,374	624,436	277,404,552	10,174,822
1979	275,253,064	–0–	275,253,064	2,346,774	264,910,958	10,342,106
1980	393,734,024	–0–	393,734,024	108,962,332	354,360,169	39,373,855
1981	272,476,455	–0–	272,476,455	216,161,017	216,161,017	56,315,438
Total Regular ODS	\$6,399,838,788	\$238,186,435	\$6,161,652,353	\$334,537,247	\$6,014,817,115	\$146,835,238
Soviet Grain Programs	146,444,444	–0–	146,444,444	316,423	144,058,407	2,386,037
Total ODS	\$6,546,238,232	\$238,186,435	\$6,308,096,797	\$334,853,670	\$6,158,875,522	\$149,221,275

Table 14: OPERATING-DIFFERENTIAL SUBSIDY ACCRUALS AND OUTLAYS BY LINES—
JANUARY 1, 1937, TO SEPTEMBER 30, 1981

Lines	Accruals			ODS Paid ^a	Net Accrued Liability
	ODS	Recapture	Net Accrual		
Aeron Marine Shipping	18,829,958	-0-	18,829,958	17,108,704	1,721,254
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	701,299,996	10,700,587	690,599,409	683,121,281	7,478,128
American Mail Lines ³	158,240,739	7,424,902	150,815,837	150,815,837	-0-
American President Lines ³	798,275,674	17,676,493	780,599,181	769,681,682	10,917,499
American Shipping	7,052,025	-0-	7,052,025	6,548,893	503,132
American Steamship	111,751	-0-	111,751	76,462	35,289
Aquarius Marine Co.	9,063,101	-0-	9,063,101	7,815,902	1,247,199
Aries Marine Shipping	22,332,947	-0-	22,332,947	19,399,450	2,933,497
Atlantic & Caribbean S/N ¹	63,209	45,496	17,713	17,713	-0-
Atlas Marine Co.	7,807,174	-0-	7,807,174	6,580,666	1,226,508
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.	16,968,935	-0-	16,968,935	13,772,172	3,196,763
Delta Steamship Lines	405,618,506	8,185,313	397,433,193	375,318,171	22,115,022
Ecological Shipping Co.	5,132,094	-0-	5,132,094	4,182,841	949,253
Farrell Lines	471,916,662	1,855,375	470,061,287	455,867,544	14,193,743
Prudential Lines ⁴	582,933,194	24,223,564	558,709,630	557,821,250	888,380
Gulf & South American Steamships ⁵	34,471,780	5,226,214	29,245,566	29,245,566	-0-
Lykes Bros. Steamship	977,534,910	52,050,598	925,484,312	888,169,304	37,315,008
Margate Shipping	33,065,115	-0-	33,065,115	28,906,985	4,158,130
Moore McCormack Bulk Transport	23,576,352	-0-	23,576,352	23,130,896	445,456
Moore McCormack Lines	598,236,180	17,762,445	580,473,735	570,829,906	9,643,829
N.Y. & Cuba Mail Steamship ¹	8,090,108	1,207,331	6,882,777	6,882,777	-0-
Oceanic Steamship ⁵	114,749,126	1,171,756	113,577,370	112,775,925	801,445
Pacific Argentina Brazil Line ¹	7,963,936	270,701	7,693,238	7,693,238	-0-
Pacific Far East Line ⁶	292,197,331	23,479,204	268,718,127	260,214,752	8,503,375
Pacific Shipping Co.	8,226,796	-0-	8,226,796	6,710,102	1,516,694
Prudential Steamship ¹	26,098,640	1,680,796	24,417,844	24,417,844	-0-
Sea Shipping ¹	25,819,800	2,429,102	23,390,698	23,390,698	-0-
States Steamship	233,796,721	5,110,997	228,685,724	224,703,580	3,982,144
U.S. Lines ⁷	591,304,389	54,958,689	536,345,700	534,254,832	2,090,868
Waterman Steamship	172,849,054	-0-	172,849,054	165,127,824	7,721,230
Worth Oil Transport	9,198,117	-0-	9,198,117	8,030,260	1,167,857
Zapata Products	16,172,141	-0-	16,172,141	14,673,510	1,498,631
South Atlantic Steamship ¹	96,374	84,692	11,682	11,682	-0-
Seabulk Transmarine I & II, Inc.	1,189,283	-0-	1,189,283	885,370	303,913
Equity	740,002	-0-	740,002	459,006	280,996
Total Regular ODS	\$6,399,838,788	\$238,186,435	\$6,161,652,353	\$6,014,817,115	\$146,835,238
Soviet Grain Programs⁸	146,444,444		146,444,444	144,058,407	2,386,037
Total ODS	\$6,546,283,232	\$238,186,435	\$6,308,096,797	\$6,158,875,522	\$149,221,275

¹ No longer subsidized or combined with other subsidized lines.

² AEL was acquired by Farrell Lines, March 29, 1978.

³ APL merged its operations with AML's, October 10, 1973.

⁴ Changed from Prudential-Grace Lines, Inc., August 1, 1974.

⁵ Purchased by Lykes Bros. Steamship Co.

⁶ Went into receivership August 2, 1978.

⁷ Ceased to be subsidized line in November 1970.

⁸ Included 33 subsidized operators as of September 30, 1979.

⁹ Includes prior year adjustments between operators.

Table 15: ODS CONTRACTS IN FORCE—SEPTEMBER 30, 1981**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	22	Transpacific Services: ¹		
			California/Far East Line A (TR 29)	72	108
			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	—
Delta Steamship Lines, Inc. MA/MSB-353	1-01-76 to 12-31-95	11 13	U.S. Gulf/East Coast South America (TR 20)	26	Overall maximum not to exceed 77
			U.S. Gulf/West Africa (TR 14-2)	24	
Delta Steamship Lines, Inc. MA/MSB-425	6-17-78 to 12-31-97	13	U.S. Atlantic/West Coast South America (TR 2)	48	62
			U.S. Atlantic/Caribbean (TR 4)	22	33
			U.S. Pacific/Caribbean, East and West Coast South America, Mexico, Central America (TRs 23, 24, 25)	25	42
Farrell Lines, Inc. MA/MSB-352	1-01-76 to 12-31-95	11	U.S. Atlantic/West Africa (TR 14-1)	20	Overall maximum not to exceed 89
			U.S. Atlantic & Gulf/Australia & New Zealand (TR 16)	16	
			U.S. West Coast/Australia & New Zealand (TR 27)	14	24
Farrell Lines, Inc. MA/MSB-482	1-01-81 to 12-31-2000	8	U.S. Atlantic/Mediterranean-India Service (TRs 10, 13, 18)	58	88
			a. Mediterranean Subservice	44	66
			b. India Subservice	14	22
Lykes Bros. Steamship Co., Inc. MA/MSB-451	1-01-79 to 12-31-98	44	U.S. Gulf/U.K.-Continent (TR 21)	36	60 ⁵
			U.S. Gulf/Mediterranean (TR 13)	42	48
			U.S. Gulf/Far East (TR 22)	36	60 ^{6, 7}
			U.S. Gulf/South & East Africa (TR 15-B)	18	24 ⁶
			U.S. Gulf/West Coast South America (TR 31)	24	36
			Great Lakes/Mediterranean-India (TR 4)	3	10
			U.S. Pacific/Far East (TR 29)	20	Overall maximum not to exceed 318
			U.S. Pacific/Far East (TR 17/29)	20	
Moore McCormack Line, Inc. MA/MSB-338	1-01-75 to 12-31-94	13	U.S. Atlantic/East Coast South America (TR 1)	40	70
			U.S. Atlantic/South & East Africa (TR 15-A)	22	36
Prudential Lines, Inc. MA/MSB-421	1-01-78 to 12-31-97	3	U.S. North Atlantic/Mediterranean (TR 10)	24	36

American Cruise Lines, Inc., and an affiliate of Exploration Cruise Lines, have requested Title XI loan guarantees to assist in expanding their fleets. American operates along the Atlantic Coast and Exploration provides service on the U.S. and Canadian Pacific Coast.

Section 804 Activities

Section 804 of the Merchant Marine Act of 1936, as amended, makes it unlawful for any contractor receiving ODS or any holding com-

pany, 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.

Section 804 waivers were granted to two liner companies—Farrell Lines, Inc., and United States Lines, Inc.—during FY 1981.

Two waivers previously granted to Farrell were reaffirmed and included in its new 20-year ODS agreement

(MA/MSB-482), permitting the firm to continue to own an interest in Denco Shipping Lines, a feeder service at Monrovia, Liberia, and to act as husbanding agent for Compagnie Maritime Zairoise in U.S. Atlantic ports.

United States Lines was granted two waivers in relation to the award of its 20-year ODS agreement (MA/MSB-483): (1) to charter and operate the German-flag vessel MARGRET between ports in the United Kingdom, France, the Netherlands, and West Germany and (2) to charter the Liberian-flag vessel AMERICAN MOHAWK, which operates in the Far East and Africa,

Table 15: (Continued)

Operator and Contract No.	Contract Duration	Number of Subsidized Ships	Service (Trade Route/Area)	Annual Sailings	
				Minimum	Maximum
United States Lines, Inc. MA/MSB-483	1-09-81 to 1-08-2001	4	U.S. North Atlantic/Western Europe (TR 5, 7, 8, 9)	39	52
Waterman Steamship Corp. MA/MSB-115	6-04-71 to 6-03-91	6	U.S. Atlantic-Gulf/India, Persian Gulf & Red Sea, Indonesia, Malaysia, Singapore, Brunei (TRs 18, 17) ^a	30	40
Waterman Steamship Corp. MA/MSB-378	10-26-76 to 10-25-96	2	U.S. Atlantic-Gulf/Far East, Indonesia, Malaysia, Singapore, Brunei (TRs 12, 22, 17) ^a	8	12
Waterman Steamship Corp. MA/MSB-450	11-21-78 to 11-20-98	2	U.S. Gulf/Western Europe (TR 21)	24	35 ¹⁰

Total Liner Trades

139

¹ Dual service privileges provide that sailings made by vessels calling at ports in both California (Line A) and Washington-Oregon (Line B) count toward the minimum and maximum sailings specified for each area with the outbound and inbound portions of the sailings being counted and applied separately to determine the number of sailings serving each area.

² Service to/from U.S. Atlantic 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 Principally, Sea Barge Carriers operate on TR-21. Each sailing of a Sea Barge Carrier counts as two sailings toward the contractual minimum/maximum of 30/60; thus, actual sailing min/max for Sea Barge Carriers is 18/30.

⁶ Lykes has the option to perform additional sailings on TRs-22 and 15-B over maximum sailings: On TR 22, 9 additional sailings; on TR 15-B, 5 additional sailings. The overall maximum must not exceed 318 annual sailings.

⁷ 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).

⁸ Except on 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 12/29.

⁹ Operations to the Indonesia, Malaysia, Singapore, Brunei (TR 17) area under Contract Nos. MA/MSB-115 and MA/MSB-378 are to provide a minimum of 12 and a maximum of 18 sailings annually.

¹⁰ The minimum/maximum requirement of 24/35 sailings per annum is based upon the operation of four C4 vessels on TR 21. The four C4 vessels are to be replaced by two Ro/Ro container vessels. The first Ro/Ro container vessel is scheduled for delivery in November 1981 and the second Ro/Ro container vessel for delivery in July 1982. Minimum/maximum sailing requirements shall be reduced to 16/24 when the second Ro/Ro container vessel enters service.

(Continued on page 24)

Table 15: (Continued)**B. Bulk Trades:**

Operator and Contract No.	ODS Agreements		Number of Subsidized Ships 9/30/81	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	2	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
Aries Marine Shipping Co. MA/MSB-129	8-09-73	8-08-93	2	Worldwide Bulk Trade	335
Atlas Marine Co. MA/MSB-274	12-30-76	12-29-96	1	Worldwide Bulk Trade	335
Chestnut Shipping Co. MA/MSB-299	12-01-76	11-30-96	2	Worldwide Bulk Trade	335
Equity Carriers, Inc. MA/MSB-439	5-24-81	5-23-2001	3	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
Pacific Shipping, Inc. MA/MSB-273	7-24-76	7-23-96	1	Worldwide Bulk Trade	335
Seabulk Transmarine I MA/MSB-440	3-27-81	3-26-2001	1	Worldwide Bulk Trade	335
Seabulk Transmarine III MA/MSB-442	9-20-81	9-19-2001	1	Worldwide Bulk Trade	335
Worth Oil Transport Co. MA/MSB-271	2-20-76	2-19-76	1	Worldwide Bulk Trade	335
Total Bulk Trades			26		

and the FORMOSA CONTAINER and STRAIT CONTAINER, which operate between Hong Kong and Taiwan.

Previously granted waivers for 24 companies were updated and renewed to allow them continued operation in the special U.S.S.R. grain ODS program.

International Bulk Trades

Oil freight rates were depressed through FY 1981 as a result of a

world oil glut, an overtonnage in very large crude carriers (VLCCs) and ultra large crude carriers (ULCCs), sporadic resumption of exports by Iran and Iraq, and continuing tensions in the southern Mediterranean.

Dry-bulk trades fared better than the oil trades at the start of FY 1981. However, a general decline in dry freight rates began in January 1981 and continued for the rest of the fiscal year. In September, a slight improvement was noted, but it was more a "leveling-off" than a recovery.

A rising level of excess dry-bulk shipping capacity, a general strike in Poland, disruptions in the Australian coal trade, a U.S. coal mine strike, and an unexpected European energy surplus sent many combination carriers into the grain trades. This depressed freight rates in all the major dry-bulk trades.

The Great Lakes-St. Lawrence Seaway became a competitive alternative route for U.S. export coal for the first time ever during this reporting period. More than 1.6 million tons of Northern Appalachian coal moved through the Lake Erie

Table 16: SOVIET GRAIN ODS CONTRACTS IN EFFECT SEPTEMBER 30, 1981

Company	Date Approved	Vessels
Anchorage Tankships	11-24-72	OVERSEAS ANCHORAGE
Columbia Transport, Inc.	03-09-73	COLUMBIA
Connecticut Transport	11-24-72	CONNECTICUT
Cove Ships	12-31-79	COVE SAILOR
Cove Tankers Corp.	"	COVE EXPLORER
	"	COVE NAVIGATOR
	07-13-76	COVE COMMUNICATOR
Cove Trading	09-13-78	COVE TRADER
Cove Ventures	07-06-78	COVE LEADER
Intercontinental Bulk tank	12-05-72	OVERSEAS ALASKA
	11-30-77	OVERSEAS ALICE
Merrimac Transport, Inc.	03-09-73	MERRIMAC
Monticello Tanker	04-17-73	MONTICELLO VICTORY
Montpelier Tanker	04-20-73	MONTPELIER VICTORY
Mount Vernon Tanker	12-18-72	MOUNT VERNON VICTORY
Mount Washington Tanker	12-18-72	MOUNT WASHINGTON
New Tankers	03-05-73	ACHILLES
Ocean Transportation	11-24-72	OVERSEAS ALEUTIAN
	"	OVERSEAS ULLA
Ogden Leader Transport	04-08-80	OGDEN LEADER
Overseas Bulk tank	12-05-72	OVERSEAS ARCTIC
	02-15-77	OVERSEAS JUNEAU
	11-30-77	OVERSEAS VALDEZ
Overseas Oil Carriers	11-24-72	OVERSEAS JOYCE
Penn Tanker	01-03-73	OGDEN CHALLENGER
	"	OGDEN CHAMPION
Potomac Transport, Inc.	03-09-73	POTOMAC
Rio Grande Transport	04-08-80	OGDEN CHARGER
Vivian Tankships	12-05-72	OVERSEAS VIVIAN
Wabash Transport	11-24-72	OGDEN WABASH
Willamette Transport	11-24-72	OGDEN WILLAMETTE

ports of Conneaut, Sandusky, Toledo, and Erie. These shipments were in addition to U.S. domestic and Canadian coal shipments normally in the range of 30 million tons per year. They demonstrate the significant capacity and potential of these ports in U.S. foreign trade.

Future export potential for the Great Lakes-St. Lawrence Seaway route could expand to 15 million tons per shipping season if the foreign demand for U.S. coal continues at a high level and if there is an adequate number of Lake feeder vessels, an uncongested Welland Canal, and continued congestion at U.S. Atlantic coal loading ports.

Foreign Transfers

During FY 1981, MARAD approved the transfer of 30 privately owned American ships of 1,000 gross tons and over to foreign firms. Eight were sold for scrapping abroad (see Table 17).

Permission also was granted for the foreign transfer of 389 vessels of less than 1,000 gross tons during the fiscal year. These included 191 commercial and 198 pleasure craft.

In addition, MARAD approved 103 U.S.-owned ships of over 1,000 gross tons and 967 under 1,000 gross tons for charter to non-citizens.

Pursuant to Public Law 89-346 and 46 CFR 221.21-221.30, approval was granted during the year for 50 banks to continue on the Roster of Approved Trustees. Four new banks were approved as trustees.

During the fiscal year, 27 violations involving privately owned ships were reported and 46 previous violations were mitigated or settled.

User charges for filing applications for foreign transfers and similar actions totaled \$163,665, including \$2,860 in fees paid pursuant to prior transfer contracts.

Table 17: FOREIGN TRANSFER APPROVALS—FY 1981

	Pursuant to Section 9 (U.S. owned and U.S. documented)		
	No. of Vessels	Gross Tons	Average Age
Tankers	4	45,210	32.5
Cargo	9	91,822	46.0
Cargo/Passenger	—	—	—
Miscellaneous	17	42,857	22.0
Total	30	179,889	31.3
Recapitulation By Nationality:	Number	Gross Tons	
Canadian	6	38,321	
Honduran	1	2,850	
Mexican	5	7,474	
Panamanian	9	37,459	
Total	21	86,104	
Sales to Aliens Only	1	11,447	
Sales to Aliens for Scrapping	8	82,338	
Total	9	93,785	
GRAND TOTAL	30	179,889	

Environmental Protection

MARAD participates in national and international efforts to preserve and improve the quality of the marine environment.

The Agency promotes environmental quality by assisting other agencies and organizations in the development of international standards for ship design, construction, equipment, and operation and through pollution-control programs designed to protect the marine environment from vessel discharges of oil, hazardous substances, sewage, garbage, stack emissions, and volatile cargo vapors.

During this reporting period, MARAD and the Environmental Protection Agency co-chaired the Interagency Review Board for the Chemical Waste Incinerator Ship Pro-

gram. The board, which also includes the U.S. Coast Guard and other agencies, coordinates and expedites all U.S. Government activities related to incineration at sea.

The United States currently confronts a serious and massive hazardous waste-disposal problem. Incineration at sea aboard specially designed and equipped ships has been advanced as a cost-effective, technically efficient, and environmentally acceptable technology for the destruction of many types of combustible hazardous waste.

In February 1981, MARAD released a report entitled *Assessment of Asbestos Concentration on Marine Vessels: Maintenance and Repair Operations*. The study identified exposures of personnel aboard active merchant ships. No ambient exposures aboard tested ships were in excess of Government limits, but protective measures were recommended for certain work procedures

carried out in close proximity to the material.

The exposure to asbestos of MARAD and non-MARAD personnel involved in the Agency's activities was also addressed during the reporting period. An "Action Plan for the MARAD Asbestos Hazard Control Program," intended to specify responsibility for detailed preventive action, was drafted. The Agency determined that no hazards exist during the pre-sale buyer's inspection of surplus Government vessels, and began a study to assess asbestos exposure in the retention vessels of its National Defense Reserve Fleet.

During this reporting period, MARAD also took part in the activities of the Maritime Safety and Marine Environment Protection Committees of the Intergovernmental Maritime Consultative Organization (see Chapter 9).

Domestic Operations

The domestic segment of the American merchant marine carries more than one billion tons of cargo annually. These operations include the Great Lakes, the inland waterways, and the noncontiguous ocean, intercoastal, and coastwise trades.

Great Lakes

The U.S. Great Lakes fleet numbered 144 vessels at the close of fiscal year 1981—a decrease of one ship during this reporting period. However, the fleet's estimated cargo carrying capacity increased by 200,000 deadweight tons (dwt.) to a total of 3.1 million dwt. (See Table 18.) This increase reflects the trend of replacing smaller obsolete vessels with new, larger, self-unloading bulk carriers. The average age of the Great Lakes fleet dropped from 39 to 37 years, and 42 percent of its tonnage was concentrated in vessels less than 10 years of age as of September 30, 1981.

During FY 1981, three new Great Lakes self-unloading dry-bulk carriers were delivered from Great Lakes shipyards. These vessels, with a total deadweight of 170,000 tons, were constructed with Title XI guarantees.

The downturn in the national economy that began during FY 1980 continued into FY 1981, particularly affecting domestic bulk cargo movements. Although more cargo was carried during FY 1981 than in FY 1980, a decline in consumer demand for automobiles and steel reduced the number of operating vessels on the Great Lakes. By the end of the fiscal year, 36 percent of the dry-bulk fleet was laid up.

Exports of coal via the Great Lakes-Seaway System grew dramatically during 1981. Approximately 1.6 million tons of coal, in addition to normal domestic and

Canadian shipments, was shipped from the ports of Ashtabula, Conneaut, Erie, Sandusky, and Toledo for overseas destinations. In August, Great Lakes vessels assisted in the largest shipment of U.S. export coal ever to leave North America on a single ship. One hundred sixty thousand short tons were carried by self-unloading lakers and transferred directly into the holds of an ocean-going bulk carrier in the St. Lawrence River.

In addition, *Great Lakes Ports Export Coal Potential*, a study developed by the Maritime Administration's (MARAD's) Great Lakes Region, increased shipper awareness of the capabilities of moving coal to international markets through the Lakes and Seaway.

Meanwhile, MARAD continued to aid Great Lakes operators by providing information on cargo flows, shipboard labor requirements, and new shipboard equipment and marine technology.

Inland Waterways

Among the key developments in the inland sector of waterborne transportation were studies of waterway user charges and tank barge pollution.

Public Law 95-502 (approved October 21, 1978) imposed a fuel tax on vessels in commercial waterway transportation for the first time in the Nation's history. The tax, initially four cents per gallon, became effective October 1, 1980, and is scheduled to be increased each year until it reaches a maximum of 10 cents per gallon on October 1, 1985.

During FY 1981, MARAD assisted the Secretaries of Transportation and Commerce in the preparation of a study with respect to inland waterway user taxes and charges mandated by Section 205 of P.L. 95-502.

The Agency supported a U.S. Coast Guard-sponsored study of ways to reduce tank barge pollution. The study, conducted by the National Academy of Sciences' Maritime Transportation Board,

found that instead of the single, blanket regulation originally proposed, the Coast Guard should consider different regulations according to location and type of operation.

MARAD also participated with the Coast Guard in an analysis of vessel traffic safety on the lower Mississippi River conducted by Louisiana State University. The objective of the study, scheduled for completion in 1982, is to determine which navigational aids, communications, and electronic surveillance techniques would contribute most to the safety, productivity, and effectiveness of the New Orleans Vessel Traffic Management System.

Domestic Ocean Trades

As of September 30, 1981, there were 235 large, self-propelled merchant vessels with a carrying capacity of 10.9 million dwt. operating in the U.S. coastwise, intercoastal, and domestic offshore trades. This reflected a decrease of 22 vessels and 300,000 dwt. from FY 1980 totals. However, several large vessels were added to the domestic fleet during this reporting period. Among these were the new 31,000-dwt. product carrier NEW YORK SUN and the 33,700-dwt. deep-notch tug/barge ENERGY FREEDOM designed to carry coal to New England from other East Coast ports.

In the Alaskan crude oil trade, during the fiscal year 47 U.S.-flag and 7 foreign-flag tankers lifted 83.3 million long tons, an increase of 5.1 million tons, or 6 percent, over FY 1980 levels. The tankers made a total of 631 voyages from Valdez. The U.S.-flag vessels served ports in the lower 48 States, Alaska, Hawaii, and Puerto Armuelles in Panama (for transshipment). The foreign-flag ships served the U.S. Virgin Islands directly by way of Cape Horn.

The market share of U.S.-flag tankers in the Virgin Islands refined products trade declined to 31 percent in the first 6 months of FY 1981. The U.S.-flag tankers carried 51 percent of commercial ship-

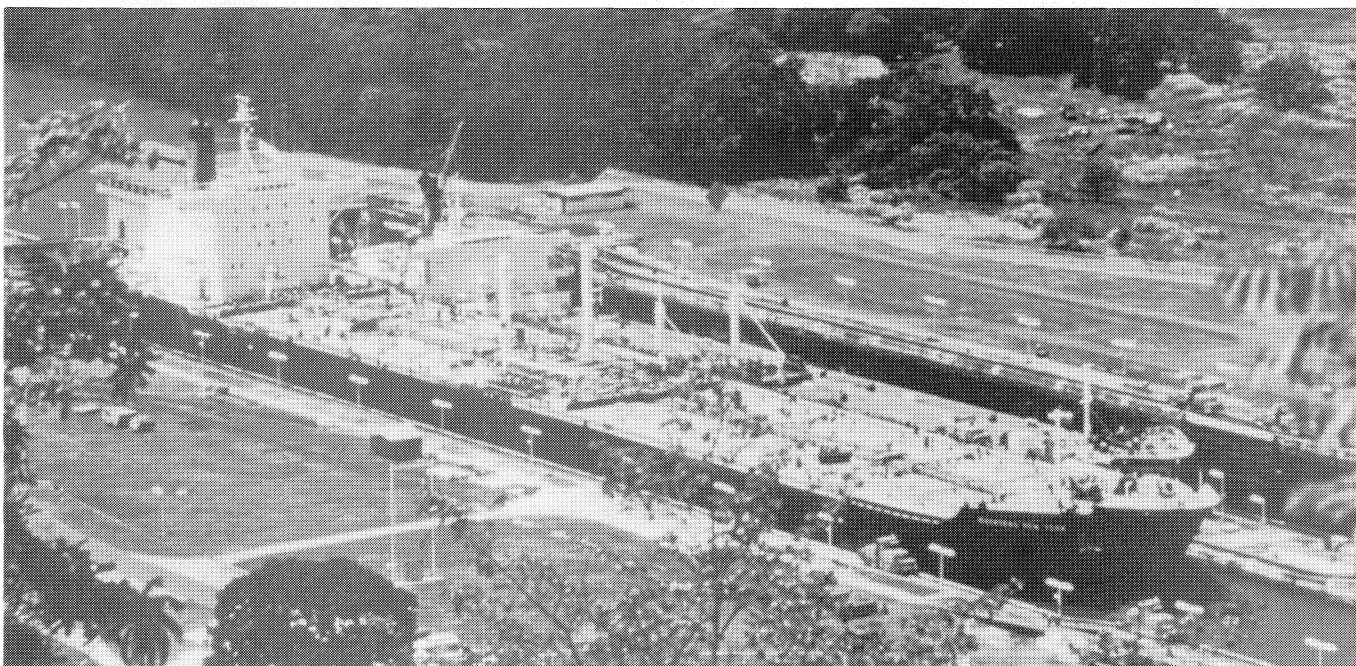
Table 18: U.S. GREAT LAKES FLEET—SEPTEMBER 30, 1981¹

	Vessels	Gross Registered Tons	Estimated Deadweight Tons
Total	144	1,707,721	3,112,978
Bulk Carriers	129	1,638,420	3,071,525
Active	82	1,185,698	2,272,500
Temporarily Inactive	36	356,036	636,250
Laid-Up (Inactive for more than a year)	11	96,686	162,775
Tankers	6	29,326	41,453
Active	4	18,043	25,480
Temporarily Inactive	2	11,283	15,973
Others ²	9	39,975	³
Active	4	13,188	
Temporarily Inactive	2	6,910	
Laid-Up (Inactive for more than a year)	3	19,877	

¹ Self-propelled vessels of 1,000 gross tons and over (includes the integrated tug/barge vessel PRESQUE ISLE of 57,500 deadweight tons which, for operations purposes, is considered a self-propelled vessel).

² Includes railroad car ferries, auto ferries.

³ Not available.



Tankers OVERSEAS NEW YORK (foreground) and OVERSEAS ALASKA (partially obscured) move through Pedro Miguel Locks, transiting Panama Canal with Alaskan crude oil destined for Eastern U.S. market.



COOPERATIVE SPIRIT, at 10,500 horsepower, rated among most powerful and largest towboats operating on U.S. inland waterways, pushes tow on Mississippi River near Vicksburg, Miss. Vessel is owned and operated by Agri-Trans Corp., St. Louis, Mo.

ments from the islands to the mainland during the corresponding period in the preceding fiscal year.

Charter Market Activity

The Alaskan crude oil trade and the Gulf-to-Atlantic-Coast (or "up-coast") petroleum trades together accounted for the major share of the U.S. domestic tanker market activity in FY 1981.

The Alaskan oil market provided stable employment for the domestic tanker fleet. A relatively steady flow averaging almost 1.5 million barrels of crude oil per day moved through the TransAlaska Pipeline to Valdez for ocean transport.

A temporary lack of domestic trade tankers available for service in the Alaskan oil trade prompted MARAD to grant permission for five very large crude carriers built with the aid of construction-differential subsidy (CDS) to enter the domestic trade on a short-term basis. Regula-

tions permit the transfer of a subsidized vessel to the Alaskan crude oil trade, under certain conditions, for a period of up to 6 months of any 12-month period with a pro rata payback to the Government of CDS for the time spent in domestic service.

The upcoast petroleum market continued its lackluster performance for the second consecutive year, reflecting two nationwide trends—reduced consumption and large inventories of crude oil and petroleum products. By the close of FY 1981, freight rates in the single-voyage (or "spot") market began to move upward with the normal seasonal increase of heating fuel movements to East Coast consumers. Although a majority of tankers involved in this trade were proprietary vessels (either owned or long-term chartered and operated by oil companies), a significant single-voyage market continued for independent tanker operators.

Trade Studies

During FY 1981, MARAD studied the potential economic impacts of a proposed rule concerning the total repayment of CDS for a vessel in exchange for the permanent removal of domestic trade restrictions. This restriction provision is in all CDS contracts. MARAD proposed the rule, applicable only to tankers of at least 100,000 dwt., to provide guidelines and procedures for approval of applications to repay CDS which can be applied uniformly to all applicants.

MARAD examined several courses of action regarding repayment of subsidy. Analysis of the economic impacts of each alternative revealed that the greatest potential benefits could be achieved through the establishment of generalized evaluative criteria for allowing the owner(s) of a specific vessel to repay all CDS involved.

The study recognized that these benefits would depend on prevailing conditions and circumstances (including market conditions and the financial condition of the applicant) at the time application for repayment was submitted. Therefore, it was concluded that repayment could best be determined on a case-by-case basis.

Market Development

The Maritime Administration (MARAD) engages in a comprehensive market development program designed to increase U.S.-flag carriage of the Nation's oceanborne foreign trade.

Marketing Program

The Agency's marketing program is conducted at its Washington, D.C., headquarters and nine strategic locations throughout the country. In fiscal year 1981, trade specialists assigned to the four regional and five area offices continued consultations with the transportation policymakers of firms engaged in foreign commerce, promoting the Agency's "Ship American" program in both the liner and international charter trades.

Voluntary reports received from shippers and carriers since the marketing program was begun in 1973 indicate that it has produced \$180.8 million in ocean freight revenues for U.S.-flag vessels that otherwise would have gone to foreign carriers.

Many firms drew on the resources of MARAD's Shipper Information and Market Lead Systems—twin systems designed to enhance the competitive marketing ability of U.S.-flag operators.

The Shipper Information System provides trade intelligence on U.S. shippers and commodities gathered through marketing contacts and during presentations made by MARAD regional market development trade specialists. During FY 1981, it generated 23 specialized automatic data processing reports in response to requests from U.S.-flag carriers, in addition to serving the Agency's own marketing requirements.

The Market Lead System, drawing on market intelligence from private and Government sources, identified 2,558 individual business opportunities for U.S. operators.

MARAD sponsored seminars which brought together U.S.-flag carriers, shippers, and other maritime interests to foster greater utilization of U.S.-flag vessels and expand exports. Typical of this effort was a meeting sponsored by the Agency's Eastern Region at Norfolk, Va., in cooperation with local civic and maritime interests. The participants included shipper, forwarder, carrier, port, and government executives. They discussed current issues bearing on the utilization of U.S.-flag vessels.

Stressing the need to improve and expand the U.S.-flag bulk fleet, market development trade specialists continued their liaison with the ocean charter market. They met with bulk vessel operators, shippers, and potential investors in new U.S.-flag bulk carriers during this reporting period.

Marketing Analysis and Planning

MARAD's Market Analysis and Planning Program supports the market planning of U.S.-flag carriers by sponsoring studies of market demand, market economics, and strategic market planning.

During this fiscal year, the Agency studied the shipping supply and demand requirements for the ocean transportation of automotive products. A short-range trade forecasting system designed for use by carrier personnel was developed and implemented. Work, supported jointly by MARAD and the maritime industry, was begun on the development of a consistent 10-year data base of commodity flows to be used for long-range trade forecasting.

MARAD examined in depth the options available to the U.S. merchant marine if the United Nations' Code of Conduct for Liner Conferences is adopted by this

country's trading partners. The Agency also completed a report on U.S. imports and exports transshipped through Canada.

Monthly reports were issued to carriers detailing their individual competitive performance on each of the trade routes they serve.

A major study was begun on the marketing information needs of U.S. operators to identify data gaps which might lessen their competitiveness.

In the strategic market planning area, MARAD sponsored the development of a management decision model which estimates the market share increase likely to be gained from enhancements in any of 16 key service areas.

During the year, work was begun on a joint MARAD-carrier project to develop a handbook on carrier strategic planning and to demonstrate such planning techniques.

Bilateral Cargo Agreements

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

In calendar year 1980, 177,087 long tons of liner cargo moved in this trade. U.S.-flag ships carried 46,377 tons, Soviet ships 70,976 tons, and third-flag vessels the rest.

The U.S. accountable liner share for 1980 resulted in freight revenues totaling \$7,814,224, compared with a Soviet share of \$9,341,954 after deducting \$1,750,401 in excess revenue accrued by U.S.-flag ships in previous years.

During the year, MARAD also began processing data and formulating procedures to monitor liner cargo moving under the maritime agreement between the United States and the People's Republic of China.

Table 19: GOVERNMENT-SPONSORED CARGOES—CALENDAR YEAR 1980**Public Law 664 Cargoes:**

Shipper	U.S.-Flag Revenue (\$1,000)	Total Metric Tons	U.S.-Flag Metric Tons	Percentage U.S.-Flag Tonnage
Action	12	12	9	75
Board of International Broadcasting	47	150	128	85
Agency for International Development:				
Loans and Grants	57,272	1,421,225	688,857	48 ²
P.L. 480—Title II	127,797	1,595,504	861,404	54
Department of Agriculture:				
P.L. 480—Title I	119,842	3,544,373	1,452,217	41 ²
Other Agriculture Programs	24	35	29	83
Department of Commerce:				
Industry and Trade Administration	525	987	966	98
Maritime Administration	90	219	219	100
Other Agencies	50	252	98	39 ³
Department of Defense:				
Military Assistance Program				
Foreign Military Sales Credit	21,936	81,689	55,667	68 ³
Corps of Engineers—NEGEV	7,810	30,349	14,187	47 ⁴
Department of Energy:				
Bonneville Power Administration	216	5,789	2,780	48 ²
Strategic Petroleum Reserve	15,270	2,540,037	210,693	8 ⁵
Department of Health and Human Services	30	52	34	65
Department of the Interior:				
Bureau of Reclamation	200	2,384	1,019	43 ²
Other Agencies	23	48	24	50
Department of Justice	29	51	47	92
National Aeronautics and Space Administration	145	230	214	93
Tennessee Valley Authority	1,285	6,804	4,690	69
Department of the Treasury:				
Chrysler Corporation	2,549	30,957	12,070	39 ²
Other Agencies	9	8	8	100
Department of Transportation:				
Federal Highway Administration	1,393	11,529	4,877	42 ²
Urban Mass Transportation Administration	404	811	591	73
Other Agencies	36	61	48	79

(Continued on page 32)

Table 19: (Continued)

Shipper	U.S.-Flag Revenue (\$1,000)	Total Metric Tons	U.S.-Flag Metric Tons	Percentage U.S.-Flag Tonnage
International Communications Agency	1,033	1,827	1,384	76
Department of State:				
Sinai Support Mission	14	27	17	63
Foreign Building Office	309	862	797	92
Other Agencies (does not include AID)	5,442	6,729	4,912	73
Other Agencies	137	140	116	83

Public Resolution 17 Cargoes:

	Total Freight Revenue	U.S.-Flag Freight Revenue	Percentage U.S.-Flag
Export-Import Bank	\$87,039,758	\$65,270,107	75

¹ Civilian agencies plus Department of Defense Foreign Military Sales Credit Program, Military Assistance Program, and U.S. Army Corps of Engineers—NEGEV. Other Department of Defense cargoes not included.

² These agencies were below the required 50 percent participation due to the nonavailability of U.S.-flag service as provided in P.L. 664.

³ A substantial number of bill of lading equivalents for MAP and FMS cargoes were not processed from DOD tape reels.

⁴ U.S.-flag participation in the NEGEV is calculated on a revenue ton basis in accordance with an agreement between MARAD and DOD and was 54 percent in CY 80.

⁵ DOE/SPR had minimal U.S.-flag participation due partly to an oil exchange agreement, but primarily because DOE/SPR included shipments of Alaskan North Slope oil covered under the Jones Act as U.S.-flag participation and in foreign source oil acquisitions failed to provide adequate opportunities for U.S.-flag participation.

Preference Cargoes

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

To assure that cargo preference statutes are followed, MARAD monitors the shipping activities of 67 Federal agencies, including the Export-Import Bank of the United States (Eximbank), and the Military Assistance Program (MAP) and Foreign Military Sales Credit (FMS) program of the Department of Defense (DOD).

With the exception of the Eximbank, statistics for these programs are maintained on a calendar-year basis. Eximbank records are maintained for the life of the loan or

guarantee, which may extend over several years.

A computer-aided processing system and an interagency liaison program enabled MARAD to process 14,000 ocean bills of lading for 1980 cargoes covering Eximbank and other civilian agencies and FMS credit shipments.

U.S.-flag participation in the shipment of Government-generated cargoes during calendar year 1980 is summarized in Table 19. Total U.S.-flag revenue, compared with 1979 levels, declined. Because sufficient U.S.-flag ships were not available in this reporting period, American-flag participation was less than 50 percent in several programs. Had suitable U.S.-flag tonnage been available, these programs would have met the required minimum percentage.

Due to data processing problems, no MAP shipments are included in the table although MAP cargoes were transported almost exclusively on U.S.-flag vessels. FMS data in the table also are preliminary as a result of these problems.

Department of Defense

U.S. revenues from DOD's FMS program decreased from \$22.5 million in 1979 to \$21.9 million in 1980. However, the U.S. share of the FMS tonnage for which shipping documents were processed rose from 56 to 68 percent.

Strategic Petroleum Reserve

In 1977, the United States 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).

The Cargo Preference Act requires the Department of Energy (DOE) to transport at least 50 percent of the oil in U.S.-flag tankers. Under a MARAD-DOE agreement, the flag share of this trade is determined on the basis of long ton/miles rather than tonnage alone.

The SPR program was suspended in July 1979 due to unstable conditions in the Middle East. U.S.-flag tankers had carried 1.9 million long tons, which resulted in 2.8 billion

ton/miles or 30 percent of the program total. DOE agreed at that time to make up the shortfall when shipments resumed.

In 1980, DOE resumed filling the SPR through an exchange program whereby National Petroleum Reserve (NPR) cargo was exchanged for oil owned by the major oil companies. As a result of large inventories, most of the oil which was exchanged had already been delivered by foreign-flag tankers, or was in foreign-flag tankers in transit or waiting discharge in the U.S.

Gulf. The major oil companies did not offer oil carried by U.S.-flag tankers. MARAD has insisted that DOE make up the shortfall.

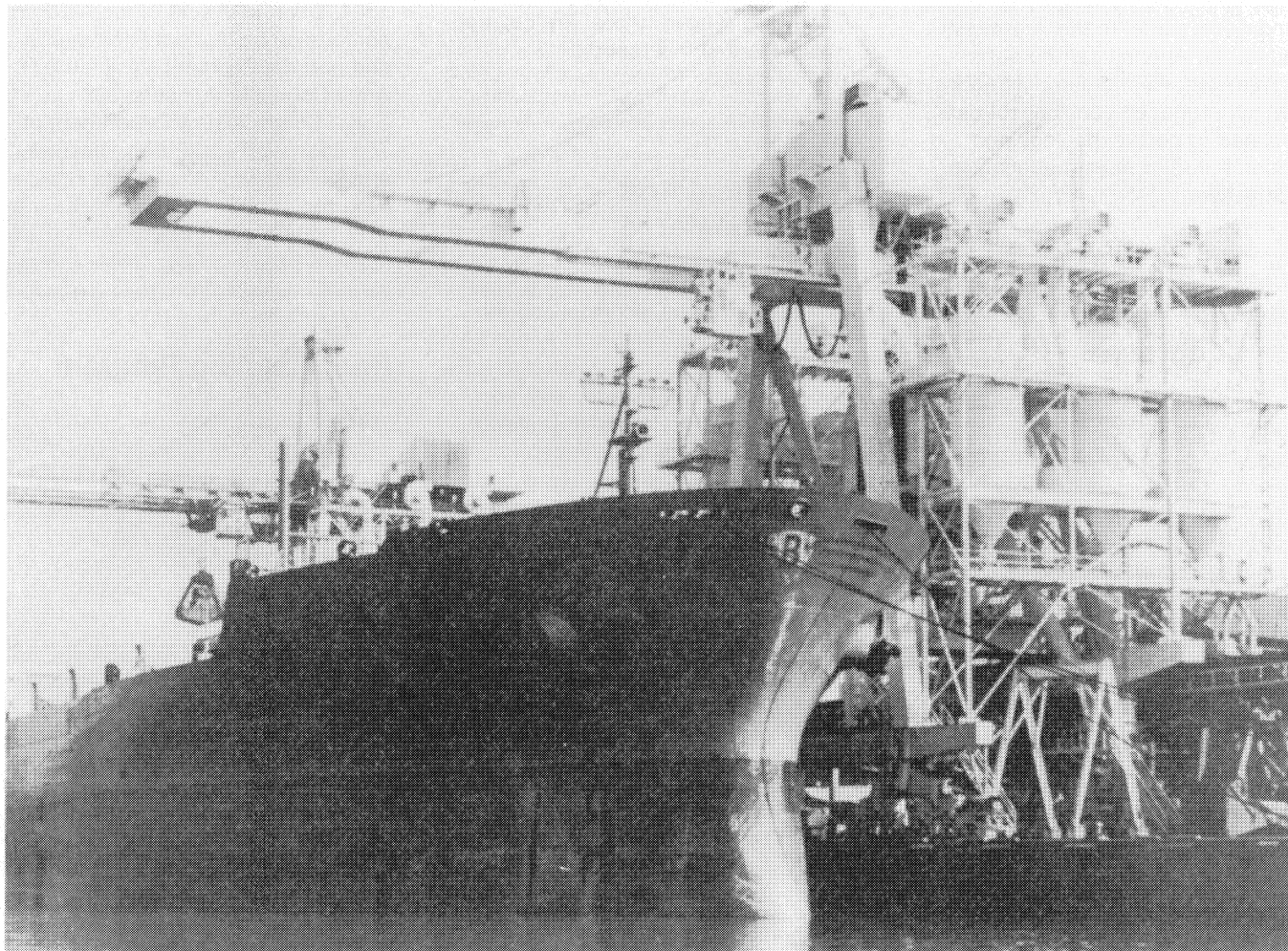
Export-Import Bank

Public Resolution 17, 73rd Congress, requires that all cargoes generated by the Eximbank be shipped on U.S.-flag vessels unless a waiver has been granted by MARAD. Statutory waivers are granted when U.S.-flag vessels are not available at reasonable rates. General waivers

are granted to permit vessels of recipient nations to carry up to 50 percent of the ocean cargoes generated by Eximbank loans, provided that the U.S.-flag carriers do not experience discrimination in trade with the recipient nation.

Total ocean revenue in the Eximbank program increased from \$64.6 million in 1979 to more than \$87 million in 1980. U.S.-flag ocean freight revenue increased from \$45.8 million to \$65.3 million over the same period.

Second of two new unloading towers, erected in \$7.4-million renovation at Alabama State Docks' Bulk Materials Handling Plant, works cargo in Port of Mobile. Each tower (note other unit, partly obscured, rear left) can unload 1,500 tons of iron ore, bauxite or other bulk material per hour. New towers replaced older facilities, in part destroyed by Hurricane Frederic in September 1979.



Chapter 5

Port and Intermodal Development

During fiscal year 1981, the Maritime Administration (MARAD) continued its support of national, regional, State, and local efforts to assist the American port industry and foster the development of intermodal transportation. These efforts help stimulate the economies of the municipalities and States involved and ensure support of national priorities in times of emergency.

In FY 1981, MARAD provided assessments of present and future port needs to other Federal Agencies, regional agencies, and individual ports. In the intermodal area, the Agency carried out investigations and demonstrations which produced cost/benefit data related to port technology and contributed to major national port objectives.

Annual Report to Congress

New legislation (Section 2, P.L. 96-371, passed October 3, 1980) requires the Secretary of Transportation to submit an annual report to the Congress on the status of public ports of the United States. The report will describe problems which ocean and inland waterway ports are experiencing as a result of technological changes, resources allocation, competition, environmental concerns, inflation, and legislation and regulation at all levels of government.

Activities Related to Coal

As industrial nations continued their shift in energy priorities toward

greater reliance on coal and the international coal market expanded, MARAD became a major participant in joint Government-industry efforts to increase U.S. coal exports. The Agency contributed to a number of projects and studies designed to assess present U.S. port capabilities and forecast both the transportation system requirements and industry's opportunities to ship more American coal abroad.

MARAD, in cooperation with other Agencies, produced a report entitled *Moving U.S. Coal to Export Markets*. This report assessed the American transportation system's present and planned capabilities for moving coal abroad.

Another study, *Great Lakes Export Coal Potential*, examined the capacity of that waterway system's coal-loading terminals and their competitive position compared to ports on the Atlantic Coast.

(A number of other MARAD activities related to coal are covered elsewhere in this report.)

Technical Port Assistance

During this reporting period, MARAD provided technical assistance on a large number of Federal programs and projects related to ports. This involved public port applications to the Economic Development Administration for Federal grants and loans and individual State plans for coastal zone management submitted to the National Oceanic and Atmospheric Administration. MARAD also reviewed the navigational improvement feasibility studies of the U.S. Army Corps of Engineers.

The Agency expanded its technical assistance to include port marketing. The initial objective was to provide information and analytical tools with which individual ports can derive or enhance their own marketing strategies.

With the assistance of the American Association of Port Authorities (AAPA), the Agency began a major effort to develop a

pricing formula which will enable U.S. ports to establish "reasonable compensatory" tariff rates for using public marine terminal facilities. The formula is especially designed to determine bench-mark prices for the use of docks, wharves, and cranes and the leasing of terminal facilities.

During the fiscal year, MARAD chaired a technical sales seminar in the People's Republic of China sponsored by the U.S. Department of Commerce's Bureau of East-West Trade and staffed by senior executives of U.S. marine and port equipment manufacturers. It also cosponsored, with the Organization of American States, a three-week Port Safety and Security Seminar conducted by the Maryland State Police and the Maryland Port Administration for Mexican port officials.

The Agency was a major sponsor of the Maritime Alaska '81 conference held in Anchorage from September 21 to September 24, 1981. Other sponsors of the Alaskan conference on maritime commerce and port development were the U.S. Army Corps of Engineers, U.S. Coast Guard, Alaska Department of Transportation and Public Facilities, and University of Alaska Sea Grant Program.

Port Planning Program

MARAD continued its cost-sharing program and actively cooperated in master planning studies with local, State, and regional port agencies and associations. The following projects were initiated, underway, or completed during this reporting period:

- *Port Public Liability Insurance and Risk Management Study*—Provides historical background for understanding U.S. port public liability insurance problems. It includes a profile of the liability insurance and risk management programs at public ports participating in the study, and a comprehensive discussion of practical alternatives for treatment of risk at the U.S. ports. This effort assists ports to

develop sound liability insurance and risk-management programs.

- *Great Lakes Cooperative Port Planning Study*—Provides a marketing strategy for the implementation of a direct overseas container vessel service between certain ports on the Great Lakes and Central Europe.
- *Delaware River Regional Port Study*—Analyzes regional long-range port development requirements in the Delaware River estuary. The study, under the management of the Delaware River Port Authority, involves four major cities and two counties.
- *Texas Port Study*—Analyzes Texas waterborne commerce and the demand it places on waterfront, wetland, and submerged land resources. Techniques to assess the impact of commerce on the State's economy are emphasized.
- *Hawaii Port Planning Study*—Continues a study which, in FY 1981, produced computer models to analyze the State's transportation and distribution activity and the capacity of its ports. The study also evaluated the role of Hawaii as a transshipment center.
- *Washington Port System Study Update*—Updates the original State of Washington Port System Study completed in 1975. Major tasks performed as part of this joint MARAD-Washington Public Ports Association effort were reworking of the waterborne commerce forecasts for ports in the study area, updating the inventory of marine terminal facilities, estimating cargo throughput capability, and analyzing the impact of the extended 200-mile fishing limit on Washington ports. The final task developed estimates of Washington port facility needs to the year 2000.
- *Western and Arctic Alaska Transportation Study*—Completes a three-phase study jointly funded by MARAD and the Alaska State Department of Transportation and Public Facilities. It encompasses all types of transportation north of the Brooks Range and along the

Alaskan West Coast from the Arctic Ocean to St. Michael. It also includes a study of sea transportation along the West Coast from St. Michael to Cape Newenham. The main purpose of the study is to help the State and local governments and agencies identify and evaluate possible improvements in transportation to and from the communities in the area and reduce transportation costs in the development of resources.

- *Maryland Statewide Port Planning Study*—Will examine alternative development strategies and uses for waterfront lands in the State's ports. It is funded under a cooperative agreement with the Maryland Department of Transportation and its Port Administration and will encompass the study of cargo demand, terminal capacity, intermodal connections, and service.
- *New York-New Jersey Regional Port Planning Study*—Will analyze cargo terminal needs and uses of city-owned docks and waterfront, intermodal services and other requirements, and future port facility sites. MARAD assisted representatives of the cities of Bayonne, Elizabeth, Jersey City and Hoboken, N.J., and the City of New York in reaching a joint agreement for this regional study.
- *American Samoa Regional Port and Distribution Study*—Planned as a study of future port requirements at Pago Pago and other ports, to include an analysis of the potential for American Samoa to act as a distribution and collection center with other island groups.
- *Guidelines for the Planning and Operation of Waterborne Passenger Transportation Systems in Urban Areas*—Continues a project to develop a manual on the planning, functional design, and operation of waterborne transit services in urban areas.
- *Commercial Port Development and Urban Waterfront Development—An Analysis of the Inter-*

relations—Investigated the common and conflicting interactions of port and urban waterfront development and recommended specific steps to improve institutional and unified strategies to achieve both options.

- *Development Plan for the Clark Street Marine Terminal (Detroit)*—Provides recommendations for developing and expanding the Clark Street Marine Terminal at the Port of Detroit.
- *U.S. Great Lakes-Seaway Port Development and Shipper Conference Series—Final Report*—Summarizes the 5-year conference plan cosponsored by MARAD, U.S. Army Corps of Engineers, St. Lawrence Seaway Development Corp., and U.S. Coast Guard. The report focused on the liner trades, traditional, domestic dry-bulk trades and improved vessel technology. It was prepared by the MARAD Great Lakes Region staff and distributed to regional maritime interests.
- *Great Lakes Marketing Corporation Feasibility Study*—Assessed the feasibility of such an organization as proposed during the U.S. Great Lakes-Seaway Port Development and Shipper Conference Series. The study was funded by the St. Lawrence Seaway Development Corp. and managed by the Great Lakes Commission.
- *Hartford Port Feasibility Study*—Provides options for port development in relation to other riverfront development projects proposed for Hartford, Conn.
- *National Trade and Vessel Analysis Report*—Consists of a new series of reports developed to serve ports and vessel operators by displaying summary trade and vessel data highlighting recent trends at U.S. ports. The reports present cargo and transport information by port and coast and as national totals. In addition, value per ton and percentage share of particular trades are indicated on a commodity basis.

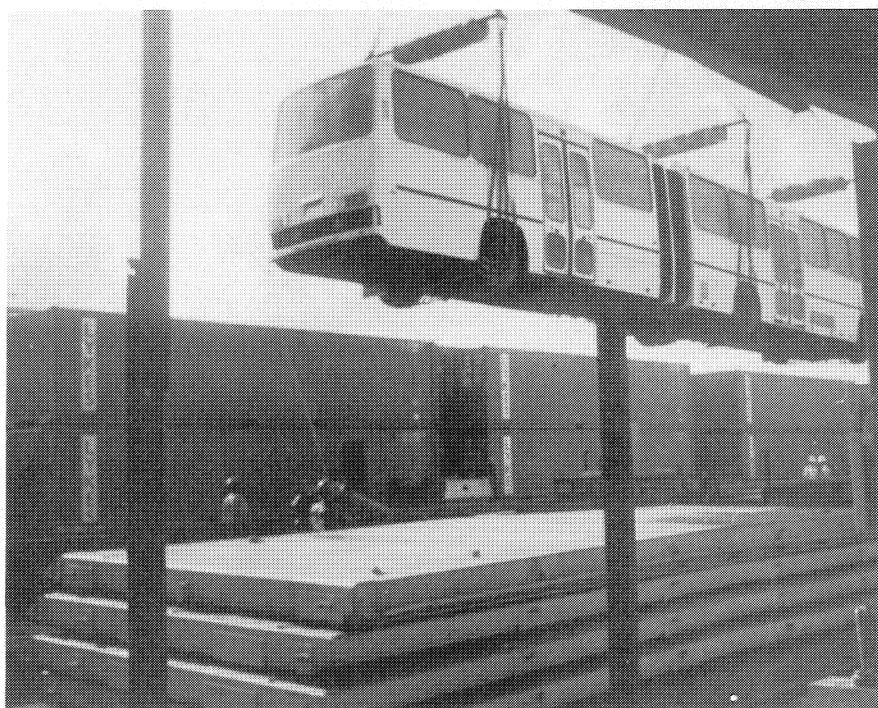
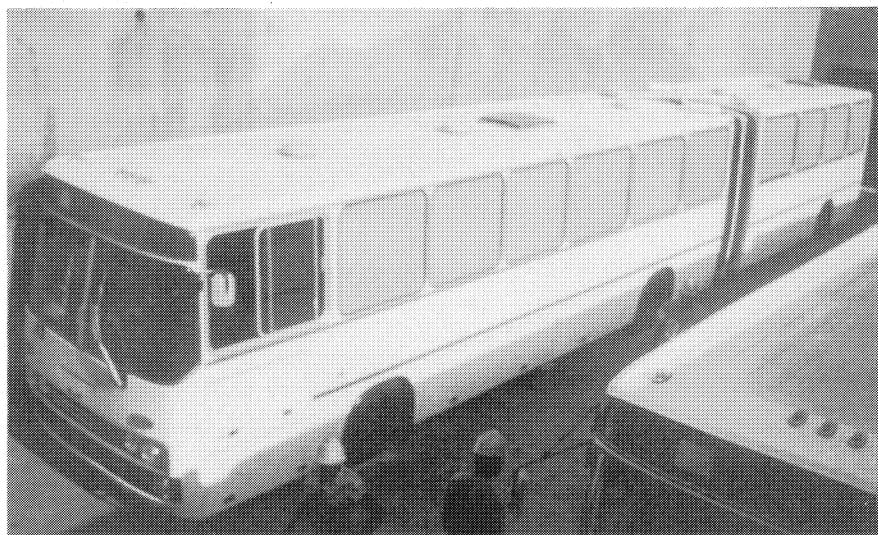
Equipment and Facilities Program

As in port planning, MARAD shares program costs with the industry and other Federal and State agencies in assisting American port and terminal operators to increase their competitiveness through improved equipment and expanded facilities.

During FY 1981, MARAD:

- Completed two major full-scale trials in berthing a large tanker using a tugboat of special design. Jointly sponsored by MARAD and the U.S. Coast Guard, the first trials were conducted in Puget Sound in January 1981. They measured the performance of tugboat utilization in the control of large tankers after a propulsion power or rudder failure. (Tanker berthing maneuvers also were scheduled in Hampton Roads in November 1981.)
- Completed an inventory of existing and potential U.S. coal export loading terminals. The inventory provides technical data for port/terminal planning purposes and support to the coal transport industry.
- Contracted for an evaluation of terminal design criteria for large, shallow-draft, wide-beam vessels for use with the coal transport industry. The analysis provides the economic rationale and the facilities design criteria for building new or improved coal export terminal facilities accommodating bulk carriers of this design.
- Participated in the City of Tacoma's evaluation of the effectiveness and capabilities of its recently procured surface-effect ship as a multipurpose harbor service craft.
- Conducted, in cooperation with the National Aeronautics and Space Administration, a demonstration at the Port of St. Louis on the feasibility of temporarily mounting lightweight, air-transportable firefighting modules aboard tugs or other available boats during fire emergencies. The modules would augment or replace existing fireboats. This would reduce municipal burdens while improving marine fire protection.
- Dedicated the Marine Terminal Automated Management System at the Port of Oakland. This cost-shared, computer-based management control system is designed to expedite the movement of containers and equipment through public, multiuser container terminals.
- Signed a cooperative agreement with the Marine Exchange of the San Francisco Bay Region for the development of a baseline management information system by the members of the National Association of Marine Exchanges.
- Contracted with the Port Authority of New York and New Jersey to produce quantitative data on the economic impact of stevedores and marine terminal operators in terms of equipment investment, jobs, income, taxes, and expenses. The data will be used in connection with a study of the U.S. stevedoring/terminal operator industry, sponsored by MARAD and the National Association of Stevedores.
- Began negotiations in 31 port cities for the signing of Port Emergency Standby Contracts for the priority handling of Department of Defense and other Federal traffic during a national emergency.
- Conducted joint exercises with the Military Traffic Management Command designed to test and evaluate procedures for marshalling commercial motor and rail transportation services to meet Department of Defense needs in a contingency prior to a declaration of national emergency.
- Completed the Upper Mississippi River Terminal Capacity Study for the Upper Mississippi River Basin Commission. The study developed an inventory of cargo-transfer facilities on the Upper Mississippi River System and their handling capacities by commodity and river pool. The information was used to assess future capacity constraints by comparing the capacity estimates against projected commodity flows through the year 2000.
- Contracted with the Massachusetts Institute of Technology to conduct a study on means to encourage the development of waterfront facilities for chemical waste incinerator ships.

Articulated buses imported from Hungary and shipped to Port of Galveston are lifted from barge in hold of Lykes Bros. Steamship Co.'s motor vessel ALMERIA LYKES onto flatcars for delivery by Sante Fe Railway to Los Angeles, Calif., mass transit system.



Research and Development

Through its research program, the Maritime Administration (MARAD) seeks to increase productivity and reduce costs in the U.S. maritime industry. The Agency works closely with ship operators, shipbuilders, and others in selecting, conducting, and implementing projects that advance the technology of American shipping. Cost-sharing by industry is a hallmark of MARAD's research and development (R&D) program. The results, in turn, are made available to the entire U.S. maritime industry in a continuing effort to increase its competitiveness in world markets.

During fiscal year 1981, the Agency obligated \$14.2 million to research and development contracts (listed in Appendix III). Of this total, some \$124,099 was committed to projects on the Great Lakes. An additional \$3.2 million was contributed to MARAD contracts through direct and indirect cost-sharing by industry and \$1.6 million in additional funds by other Federal Agencies.

MARAD research is conducted in 10 program areas, with direction from the Agency's headquarters in Washington, D.C., and assistance by its National Maritime Research Center at Kings Point, N.Y.

Shipbuilding

In 1971, when MARAD initiated its National Shipbuilding Research Program, there was virtually no ongoing technological development within the U.S. shipbuilding industry. By 1981, as a result of this Government program, an industry technical infrastructure of 25 groups had evolved, with the participants including all major U.S. shipyards, regulatory bodies, other Federal

Agencies, industry suppliers, naval architects, ship designers, and universities. These groups and individuals now are actively engaged in the development and implementation of advanced shipbuilding methods and equipment.

The Government-industry program is based on a simple premise—that the shipbuilding community is best able to identify its own problems and, with Government support, conduct research projects to solve them.

In FY 1981, for example, six U.S. shipyards participated in an R&D project to apply engineered labor standards in American shipbuilding. Labor standards pre-determine the time it should take to accomplish a specific task or produce a specific output. A rule of thumb in industry suggests that in the absence of such standards labor produces only 65 percent of its potential output. In Japan, for example, a shipyard reported achieving a 50 percent increase in productivity in one of its operations after establishing engineered labor standards. The jointly sponsored U.S. industry program is designed to produce similar gains. An overall return on investment of 15:1 has been achieved on the U.S. standards developed to date and, as the number of standards increase over the next 5 to 10 years, savings are expected to rise exponentially.

During FY 1981, MARAD initiated other R&D projects in shipbuilding facilities development, outfitting, welding, surface preparation and coating, and the use of computer aids in the industry. Two additional technical areas, design/production integration and education, were identified for research activities commencing in FY 1982.

Ship's Machinery

As a result of escalating fuel costs and further deterioration of the quality of residual fuel oils available to merchant ships, MARAD expanded its efforts to enhance the utilization of heavy fuels in diesel engines and to develop alternative fuels for existing steam-turbine propelled vessels.

The steam-propulsion research includes reconsideration of coal-fired systems. The first phase of this research is designed to develop a data base on the various coal-fired steam-turbine propulsion systems. In this fiscal year, MARAD awarded contracts to collect information on shipboard coal- and ash-handling systems; shoreside coal bunkering facilities; and the maintenance, repair, and automation requirements, dynamic analyses, and environmental impacts of such systems.

The Agency's diesel-propulsion research was concentrated on the use of heavy, degraded fuels in those engines. Contracts were awarded to evaluate the benefits of water-in-oil emulsion firing and the application of performance and condition monitoring systems in diesels.

Recent changes in oil refining prompted MARAD to look into other alternatives in marine propulsion. Because refineries are producing more distillate and less residual than previously, less residual is available for bunkering. One alternative under investigation is petroleum coke, another byproduct of the refinery process. Under a MARAD contract awarded in FY 1981, researchers are evaluating the atomization and combustion characteristics of petroleum coke-oil slurries and coal-oil mixtures and their effects on the operation, performance, and maintenance of existing ships' boilers.

Fleet Management

MARAD's Fleet Management Program applies advanced technology in information systems, communication networks, industrial engineering, and management science to improve the productivity of U.S. shipping. A major segment of the program consists of cooperative research which is cost-shared with the shipping companies.

Fleet management projects are recommended and reviewed by an industry panel established by the Society of Naval Architects and Marine Engineers.

The focus during FY 1981 was on shipboard computer applications. A functional analysis of shipboard management needs was conducted and eight areas identified for further development, each of which had significant economic benefits. Numerous shipboard application projects also were conducted. These included trim and stability, ship payroll, barge handling, chart retrieval, and preventive maintenance.

Companies from all segments of the shipping industry—general cargo, tanker, Great Lakes, and inland waterways—are developing shipboard management applications.

A highly advanced and comprehensive Vessel Management Information System, completed in FY 1981, will provide inland waterways operators and shippers with more timely and accurate information on the status of their cargoes.

Other significant activities in fleet management research during the fiscal year included the completion of a prototype evaluation of a shared-data communication system, the start of a project to implement operational data transfers between shippers' or carriers' offices ashore and vessels in transit, and the design of a distributed-data processing system for the corporate and local operations of liner companies.

Ship Performance and Safety

During FY 1981, a number of projects were carried out to make shipping more energy-efficient and safer.

Corrosion and fouling of ships' hulls, with resultant increases in fuel consumption, are ever-present problems. Following earlier successful laboratory research on the use of copper-nickel sheathing on ships' hulls, MARAD began sea-testing this program under an agreement with ARCO Marine, Inc. Plates of copper-nickel sheathing have been installed on an ARCO tanker, and the effectiveness of this sheathing will be monitored over a 2-year operational period.

Hull coating roughness is translated into horsepower losses at sea. Sophisticated gauges are being used for the precise measurement of this roughness, and to determine at what point it makes economic sense to renew the coating. Quality control measures for applying hull coatings also are being developed to ensure that the smoothest possible ship leaves the dry dock.

Other research in the area of energy conservation involved the development of a Ship Speed/Fuel Performance Monitoring System. This important development will provide ships with proven technology that will allow them to identify, and accurately quantify, ship speed/fuel losses when they occur.

MARAD's ongoing program to improve ship operations safety and efficiency through the development of a standardized bridge for U.S. vessels entered a new phase—the development of guidelines for standardized bridges. The guidelines will be based on data developed in the United States and abroad through simulations, computer studies, and at-sea tests.

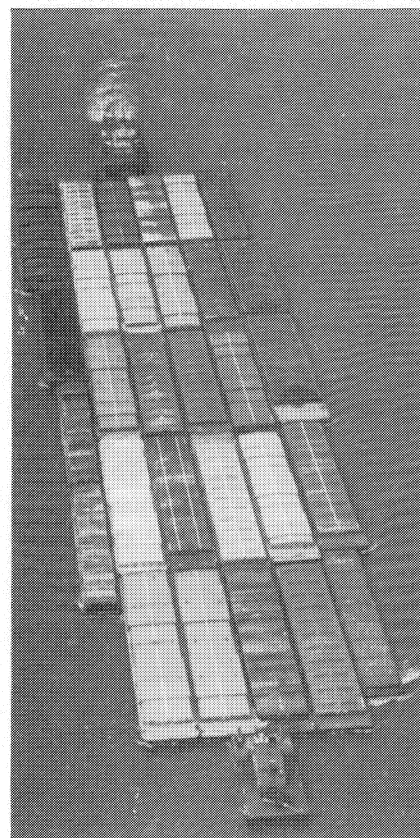
The second phase of a study of human resources in ship operations, a comprehensive survey of the crews of 20 ships, also was completed in FY 1981. The project examined shipboard environments and ways in which they affect the quality of life of U.S. merchant ship crews.

The Agency continued research designed to improve the overall capabilities of U.S. mariners.

Research also was continued on airborne asbestos aboard ship. In that effort, MARAD monitored vessels of the National Defense Reserve Fleet to determine the asbestos exposure encountered by personnel of the reserve fleet during routine inspections and repairs.

Cargo Systems

In cooperation with a group of U.S.-flag ship operators, MARAD conducted research which is expected to improve the productivity



Radio-controlled bow steering unit (bottom)—new application of older concept—helps towboat (top) guide huge tow on inland waterway. Bow steering is of special help in rounding river bends.

of marine terminals. A method was developed for measuring the various steps in transferring cargo between terminals and vessels. This process identified problem areas and measured their relative impact on overall terminal operations. Savings in the range of 15 to 20 percent are anticipated from these studies.

Research designed to enhance the military sealift capabilities of containerships was continued in two major areas—the Sea Shed project and feasibility studies on the installation of cranes aboard that type of merchant vessel.

Sea Sheds are jumbo-sized transport units—in effect, large containers—which will enable cellular containerships to carry a full range of military vehicles and equipment. The Sea Sheds are 40 feet long, 25 feet wide, and 12½ feet high, and

they can accommodate major combat equipment such as tanks and personnel carriers. In FY 1981, detailed engineering and design drawings for Sea Shed were completed and approved by MARAD and the U.S. Navy, joint sponsors of the project. Responses to requests for proposals for manufacturing and testing four prototype Sea Sheds were received and evaluated. Fabrication was scheduled to begin early in FY 1982, followed by terminal and shipboard testing of the system.

The studies on the installation of cranes seek to determine the feasibility of using such equipment to make container vessels self-sustaining and also capable of off-loading other, non-self-sustaining ships.

Another ongoing MARAD project involved the assessment of the applicability of self-unloading techniques, which have been developed for Great Lakes trades, to the oceangoing dry-bulk trades. Initial results of this research indicated definite advantages for self-unloaders over the straight-decked bulkers conventionally used in the ocean charter trades. As this project continues, researchers will examine the application of self-unloaders aboard a proposed 120,000-deadweight-ton, shallow-draft vessel for employment in the coal trade between the U.S. Atlantic Coast and Europe.

CAORF

During FY 1981, MARAD's Computer-Aided Operations Research Facility (CAORF) at Kings Point, N.Y., completed its fifth year of operation. The facility, a ship simulator, can duplicate almost any navigational problem that could be encountered by a real ship. It features a full-scale bridge surrounded by a 240-degree field-of-vision screen to display the visual scene generated by computers. Sea and weather conditions as well as port and traffic situations are realistically simulated.



ARCO TEXAS, 70,000-deadweight-ton tanker operated in Alaskan oil trade, sea-tests use of copper-nickel sheathing to keep vessel's hull clean and free from corrosion. Note rectangular panels along water line. Research in corrosion-free hulls promotes energy efficiency in ship operations.

CAORF thus provides sophisticated simulation of shipboard maneuvering and operational situations under controlled conditions. It performs research designed, among other things, to improve ship performance; help reduce ship collisions and groundings; improve the training and certification of watchstanders; assist in the development of ports and new port operations; define bridge system effectiveness; and develop standardized bridge designs.

One experiment begun in FY 1981 concerned the work/rest cycle of deck officers aboard ship. The project seeks to evaluate the effects of fatigue, boredom, and other factors on vigilance during watchstanding. During simulation runs on CAORF, psychological and physiological measurements will be taken of participants in the experiment. Eventually, analysis of these

data could lead to recommendations on revised work/rest schedules.

Another CAORF exercise, conducted for the U.S. Coast Guard, evaluated the effects of ship speed on the detection of accidental rudder deflections in restricted waterways. Results of this analysis will help determine the desirability of establishing speed limits in restricted waters.

Important experiments on coal port development also were conducted at CAORF during this reporting period. This work included an investigation of the channel widths and turning basin configurations required in maneuvering 125,000- and 225,000-deadweight-ton colliers in the Port of Norfolk, Va. The results will be used to establish the amount of dredging necessary to permit safe and efficient passage of these large vessels and will be applicable to all U.S. coal ports.

Navigation/ Communications

MARAD continued work in FY 1981 on an improved international distress and safety system which would use satellite services and automated terrestrial services developed by the Agency in the last decade. The new system is being promoted by the Intergovernmental Maritime Consultative Organization, an agency of the United Nations.

The MARAD communications technology uses low-amplitude signals spread over a relatively wide frequency band. It has been demonstrated through the MARISAT satellite located over the Pacific Ocean.

Under an agreement reached in FY 1981 with the Marine Division of the United Kingdom's Department of Trade, international trials of this technology will be conducted, with the expectation that the new distress system will become operational around 1990.

Advanced Ship Systems

Research on advanced ship systems during the year included an evaluation of U.S. dry-bulk vessel requirements, next-generation cargo liners, and coal-slurry shipping concepts. MARAD's participation in the Federal Government's Interagency Coal Task Force clearly showed the need for U.S.-flag ships to participate in the Nation's expanded export coal trade.

Work in the area of industrial plant vessels (formerly a separate research program at MARAD) included several studies to identify future concepts and establish legal and financial issues which would be encountered by U.S.-built plant vessels.

MARAD completed a study on sail-assisted motor vessels for commercial shipping. This analysis has become the standard for evaluation of new opportunities for wind-powered commercial ships.

The Agency also began studies to identify market opportunities for high-speed express vessels using surface-effect ship or air-cushion

vehicle concepts; identify high-technology power systems for future merchant vessels, such as fuel cells and advanced engines; evaluate opportunities for U.S.-flag dry-bulk vessels in the major bulk shipping markets; and explore the shipping of Arctic oil from sections of Alaska not served by the existing pipeline.

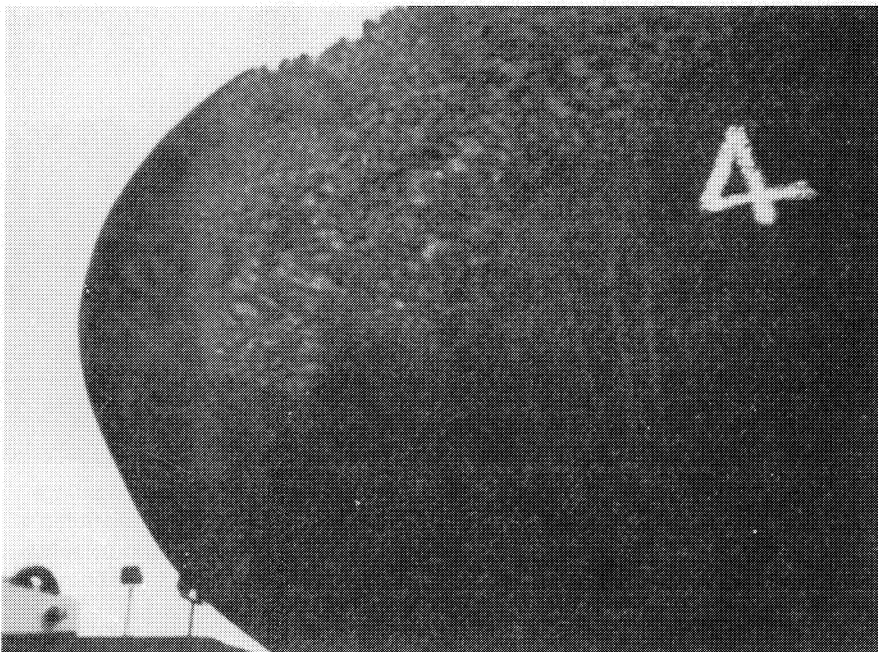
Marine Science

MARAD continued testing tunnel sterns and tandem propellers as a part of its marine science experimentation during this reporting period.

The Agency has developed a tunnel stern which does not degrade hull efficiency. This concept permits the use of propellers of larger diameters and thus improves propeller efficiency. Tandem propellers have been shown to yield significant improvements in fuel efficiency. Additional work is underway to develop design information for a systematic series of tandem propellers. This research is being conducted jointly by MARAD and Jiao Tung University in the People's Republic of China.

Canada and the United States are exchanging data and cooperating in Arctic research under a Memorandum of Understanding between MARAD and the Canadian Ministry of Transport. The United States is sharing its data on an Arctic expedition of the SS MANHATTAN and Canada is sharing data on research involving the MV ARCTIC.

During FY 1981, a third series of tests was completed by a U.S. Coast Guard icebreaker maneuvering in winter Arctic ice. The tests are aimed at increasing the technological base to permit the successful design and operation of commercial marine vessels in Arctic waters. They include the measurement of ice conditions and the evaluation of ship performance in ice.

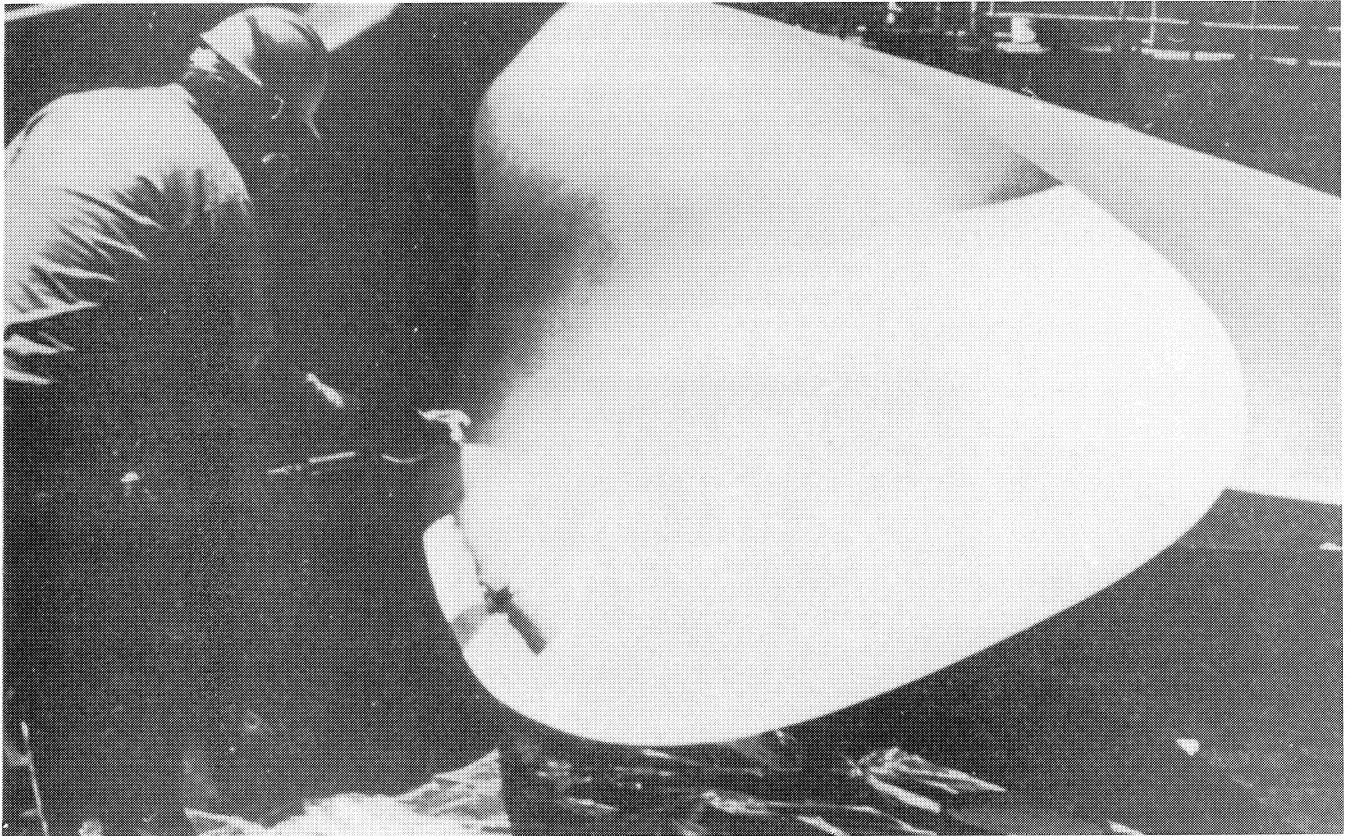


Pits and nicks depict 2 years' cavitation erosion of high-speed merchant ship propeller (note blade bearing numeral 4). Such erosion increases use of energy in ship propulsion.

University Research

In its University Research Program this year, MARAD completed work on the use of a new propulsion system with contra-rotating propellers, power plant coal conversions, urban waterborne passenger transportation systems, zone outfitting in ship construction, development of an inland waterway port model, and other projects.

This program, in its fourth year, seeks to increase the involvement of the academic community in maritime research. Ten new contracts were awarded in FY 1981.



Application of plastic-type coatings to reduce erosion of containership's propeller reduces fuel cost of vessel by estimated 1 percent, or about \$100,000 per year.

Maritime Labor and Training

The Maritime Administration (MARAD) is responsible for providing special training programs relating to safety in U.S. waterborne commerce, coordinating maritime labor policies with national and international organizations, promoting peaceful labor relations, and setting work force levels for subsidized vessels.

Maritime Training

Eight hundred merchant mariners were trained at MARAD's new standardized merchant marine fire training facility in New Orleans during this reporting period. This facility, which opened in mid-November 1980, was designed to serve the merchant marine, towing, oil, and mineral industries in the U.S. Gulf area.

Also in this reporting period, firefighting and damage control courses for merchant seamen were conducted for 2,558 seamen at Earle, N.J., and Treasure Island (San Francisco), Calif., in cooperation with the U.S. Navy Military Sealift Command and the U.S. Coast Guard.

A contract was awarded and construction started on the MARAD firefighting school in Toledo, Ohio. The Great Lakes school is scheduled to open in the summer of 1982 with modern classroom space and five shipboard simulators to provide mariners with comprehensive training. The ship firefighting course will cover 4 days and train 15 students per session.

In FY 1981, MARAD also provided collision avoidance-navigation training at its radar training centers in New Orleans, New York, San Francisco, Seattle and Toledo for qualified merchant mariners,

operators of inland waterway and off-shore drilling and mining vessels, maritime academy students, and personnel of the National Oceanic and Atmospheric Administration, U.S. Coast Guard, U.S. Army Corps of Engineers, and U.S. Naval Reserve. Nearly 2,500 students received collision avoidance-radar, gyrocompass, and LORAN training at these centers in FY 1981. Training on special radar units, with automatic radar plotting-aids capability and which are being installed on many U.S.-registered ships, has been added to this MARAD curriculum.

At the U.S. Merchant Marine Academy, 93 students completed a special diesel engineering course for licensed merchant marine engineering officers. This course is approved by the U.S. Coast Guard as equivalent to 7 weeks of the sea experience required to take diesel examinations.

U.S. Merchant Marine Academy

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

All graduates receive U.S. Coast Guard licenses as deck or engineering officers, or both, and bachelor of science degrees. Most graduates are also offered ensigns' commissions in the U.S. Naval Reserve.

The Class of 1981 included 129 third mates, 110 third assistant engineers, and 27 graduates who completed the dual deck-engine program. Among the graduates were 12 women.

Approximately 74 percent of the 266 graduates found employment on commercial vessels or were assigned to active duty in the Navy or Coast Guard.

At the beginning of the 1981-82 school year, the Kings Point Regiment of Midshipmen included

94 women—18 of whom were scheduled for graduation in June 1982.

Members of Congress nominated 2,382 constituents for the Class of 1985 and of this group 357 received appointments.

A new maritime education and training law was enacted in FY 1981. Public Law 96-453 prescribes a mandatory 5-year service obligation in the U.S. merchant marine for those students graduating from the U.S. Merchant Marine Academy, starting with the Class of 1986. Those graduates who do not fulfill their obligation may be called to active duty in a uniformed service of the United States.

State Maritime Academies

MARAD provides financial assistance to six State maritime academies in accordance with the Maritime Education and Training Act of 1980. That legislation provides for the training of merchant marine officers to meet national objectives stated in the Merchant Marine Act of 1936, as amended.

These academies are located at Vallejo, Calif.; Castine, Maine; Buzzards Bay, Mass.; Traverse City, Mich.; Fort Schuyler, N.Y.; and Galveston, Tex. Seven hundred forty cadets graduated from the six academies in 1981.

In addition to receiving U.S. Coast Guard licenses as officers in the merchant marine, graduates of the five saltwater academies receive bachelor of science degrees and, if qualified, are commissioned as ensigns in the U.S. Naval Reserve. Associate degrees are awarded by the Great Lakes Academy in Traverse City.

Upon graduation, 47.7 percent of the 1981 State academy graduates found employment afloat or chose active duty in the Navy or Coast Guard.

P.L. 96-453 established a mandatory 3-year service obligation in the U.S. merchant marine as a con-

dition to receiving an annual \$1,200 student incentive payment for all students entering the State academies after April 1, 1982. The statute also provides midshipman status for all eligible students at the six schools.

Labor Relations

All major seafaring unions affiliated with the AFL-CIO whose labor agreements expired on June 15, 1981, completed settlements without interruption of service. (There has not been a major strike in the maritime industry during negotiations since 1971.) Affiliated AFL-CIO seafaring unions include the International Organization of Masters, Mates and Pilots; Marine Engineers Beneficial Association, District 1-PCD, and District 2-AMO; American Radio Association; Radio Officers Union; Staff Officers Association; Marine Staff Officers; National Maritime Union; the Seafarers International Union of North America—Atlantic, Gulf and Pacific Districts; the Sailors' Union of the Pacific; and the Marine Firemen's Union.

The unions represent seafarers on 99 percent of U.S.-flag commercial oceangoing dry cargo ships of 1,000 gross tons and over and 80 percent on tankers.

In addition, the International Longshoremen's and Warehousemen's Union renegotiated its labor agreement effective July 1, 1981, without interruption of service.

Labor Data

During this reporting period, average monthly U.S. employment in all sectors of the U.S. seafaring industry, (private, Government contract and Great Lakes) decreased 2.8 percent—from 25,915 to 25,184 (see Table 20).

The total work force in selected U.S. commercial shipyards increased by 4.5 percent—from 116,361 to 121,542—and average longshore employment declined from 48,747 to 46,245.

In FY 1981, the Great Lakes Region Office conducted a study on *Licensed Officer Supply and Demand 1981-1990*. The study examined current and future work force supply and demand for licensed officers on the Great Lakes. It updated a report for the years 1978 through 1987 and projected a serious near-term shortage of engineers, particularly in the higher ratings, and a minimal shortage of deck officers during peak demand periods in this decade.

Merchant Marine Awards

The Merchant Marine Medals Act of 1956 authorizes the Secretary of Commerce and Secretary of Transportation to grant medals and decorations for outstanding and

meritorious service or participation in national defense action.

During fiscal year 1981, the Gallant Ship Award was presented to the T/S WILLIAMSBURGH. The Gallant Ship Plaque is awarded to any U.S. or foreign-flag vessel cited for saving lives or property through outstanding or gallant action in marine disasters or other emergencies.

The WILLIAMSBURGH was honored for its major role in the air and sea rescue of more than 450 passengers and crew members of the Dutch cruise ship PRINSENDAM, which burned and sank off the Alaska coast in October 1980. The Merchant Marine Meritorious Service Medal was presented to Captain Arthur Fertig of the WILLIAMSBURGH and Letters of Commendation were issued to the American ship's crew.

A Letter of Commendation was presented to Captain John Maddux and his crew of the tug STALWART for their prompt response and skill in rescuing five survivors of the sailing vessel SOUFRIERE after it was reported sinking in the mid-Pacific on August 22, 1980.

A Letter of Commendation also was presented to Captain Harlan E. Jackson and the crew of the USNS SEALIFT ARCTIC for the rescue of 313 Vietnamese refugees from a small boat in the South China Sea on October 27, 1980.

Table 20: MARITIME WORKFORCE AVERAGE MONTHLY EMPLOYMENT

	Average Monthly Employment in Fiscal Year:	
	1980	1981
Seafaring Shipboard Jobs:	25,915	25,184
Shipyard:	116,361¹	121,542¹
Production Workers	94,925	96,648
Management and Clerical	21,436	24,894
Longshore:	48,747	46,245

¹ Monthly averages prior to February 1, 1980, reflected employment in all commercial yards able to construct ships 475 by 68 feet; after February 1, 1980, the averages reflect commercial yards in the Active Shipbuilding Base; i.e., those constructing new ships and/or seeking new construction orders.

National Security

A primary responsibility of the Maritime Administration (MARAD) is enhancing the ability of the U.S. merchant marine to provide logistical support to the military services during national emergencies. The Agency maintains the National Defense Reserve Fleet (NDRF) as a ready source of vessels and assists the U.S. maritime industry in fulfilling its traditional role as the Nation's fourth arm of defense.

MARAD's efforts to improve the national defense posture of the American shipping and shipbuilding industries require close cooperation with the U.S. Navy and other Government Agencies.

Reserve Fleet

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

On September 30, 1981, the fleet consisted of 317 ships. This figure excludes one ship which had been sold but not delivered and one Pacific Far East Line Roll-On/Roll-Off ship moored in the James River.

During this fiscal year, 23 ships were added to the fleet and 31 withdrawn.

The number of ships in the fleet preservation program, which involves conventional preservation, dehumidification, and cathodic protection, decreased from 243 to 237 during the period.

The number of vessels in the NDRF at the end of fiscal years 1945 through 1981, is shown in Table 22.

Ready Reserve Fleet

Selected ships of the NDRF are upgraded to Ready Reserve Fleet (RRF) status and can be activated for sealift operations on 5 to 10 days' notice; an average of 4 weeks is required to activate other NDRF vessels. The goal of the RRF, a joint MARAD-U.S. Navy project, is to provide a quick-response sealift capability for U.S. military emergencies. During FY 1981, this fleet was increased from 24 to 27 ships with a sealift capacity exceeding 427,000 measurement tons.

Periodically and without advance warning, tests are conducted to ensure the military readiness of RRF vessels. The operation involves activating an RRF ship, including crewing, storing, fueling, conducting 24-hour sea trials, and then positioning the ship on a military loading berth ready to load—all within 5 to 10 days.

During the reporting period, three vessels were activated by Chief of Naval Operations No-Notice Tests and were successfully positioned to receive cargo in less than 10 days.

NDRF Energy Conservation

MARAD continued its efforts to save energy and foster more efficient use of electricity and diesel fuel at NDRF fleet sites.

Compared with the base year (FY 1973), the consumption of electricity in FY 1981 was reduced by 1,371,535 kilowatt hours, or 24 percent. However, the consumption of diesel fuel in all reserve fleet operations in FY 1981 increased, exceeding by 16,539 gallons the fuel used during the base year. This increase (about 8 percent) was attributed primarily to expansion of the Ready Reserve Fleet activity at all three NDRF sites.

Ship Sales

During FY 1981, MARAD sold for scrapping or non-transportation uses 12 Government-owned vessels, with a total return to the Government of \$2,653,635. From 1958 through 1981, a total of 2,307 vessels were sold for such purposes, with an aggregate return of \$201.3 million.

In October 1980, two obsolete vessels were sold for \$651,000 for conversion and operation in the fisheries or domestic commerce of the United States, as authorized by Public Law 96-260.

War-Risk Insurance

Title XII of the Merchant Marine Act of 1936, as amended, authorizes MARAD to administer the war-risk insurance program. Ship operators and seafarers are insured against losses resulting from war, or war-like actions, during periods when commercial insurance is not available on reasonable terms and conditions.

At the end of this reporting period, 1,691 binders were outstanding under this program. These binders would be effective for 30 days following automatic termination of commercial insurance. Binders outstanding on September 30, 1981, included 594 for war-risk hull and machinery insurance; 594 for war-risk protection and indemnity insurance; and 503 for second seamen's war-risk insurance. There were 15 foreign-flag vessels covered in each category except second seamen's, for which 11 were covered.

No binders or policies were outstanding in MARAD's related stand-by war-risk cargo insurance and builder's risk insurance programs. However, 38 commercial underwriting agents were under stand-by contracts for the war-risk cargo insurance program.

From the start of the binder program in 1952 through September 30, 1981, binder fees totaled \$1.45

million, while program expenses totaled \$1.8 million. Income from war-risk builder's risk insurance totaled \$3.5 million; investment income as provided for in Section 1208(a) of the 1936 act amounted to \$6.5 million. As of September 30, 1981, assets of the war-risk revolving fund totaled \$9.6 million.

At the request of the U.S. Navy, MARAD provides second seamen's war-risk insurance without premium charge, but on a reimbursable basis, for losses incurred, as authorized by Section 1205 of the act. Crews of 5 Government-owned tankers and 13 privately owned, U.S.-flag tankers under bareboat charter to the Military Sealift Command are insured under this program. After deducting claim payments of \$110,740, the net savings to the Navy since inception of the program are estimated to be \$2.1 million.

Marine Insurance

MARAD continued to act as the insurance claim agent for Government-owned vessels. On September 30, 1981, 12 protection and indemnity claims were outstanding, with 3 in litigation. Total settlement value of all cases was estimated to be \$450,000. Three of the claims are from the Vietnam era and have an estimated reimbursement value of \$258,000 from commercial underwriters. The balance of \$192,000 is for the account of the United States.

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.

In accordance with Section 12 of the Shipping Act of 1916, as amended, MARAD inquired into the marine insurance market, identifying domestic and foreign companies insuring and reinsuring maritime risks. MARAD also provided requested assistance to American insurers in the area of restrictive insurance legislation in foreign countries.

Table 23 shows insurance amounts approved in FY 1981.

Emergency Readiness

During the reporting period, exercise WINTEX/CIMEX-81 tested procedures for shipping support of military operations as outlined in an agreement between MARAD and the Department of Defense (DOD). Representatives of U.S. and European industry and of governments of the North Atlantic Treaty Organization (NATO) participated with MARAD and DOD agencies in the reinforcement sealift phase of the exercise.

MARAD meetings on emergency readiness with the U.S. shipping industry and DOD in FY 1981 focused on wartime container service support of defense operations, a matter that received emphasis in parallel

NATO planning. Action was initiated to develop regulations that would apply priority and allocation authority under Title I of the Defense Production Act of 1950 to the use of container services for defense support. A similar approach is planned for the use of port facilities and services. The objective is to ensure that defense needs be met effectively with minimum Government intervention in private business activities.

MARAD continued to provide analytic support to the DOD strategic mobility program, with emphasis on sealift enhancement.

A program was developed to implement authority granted by the previous Congress to retrofit national defense feature equipment. The program assigned first priority to modernization of communications on operating merchant ships. (See Chapter I, which also reports on ship design efforts involving Maritime Prepositioning Ships and mobilization ships.)

MARAD's substantial effort in NATO planning for wartime shipping operations of the alliance continued, stressing completion of the review of plans that was undertaken by NATO planners at the United States' initiative in 1975. The review is designed to reflect modern shipping technology and simplify the approach to wartime management of NATO shipping. Under revised plans, headquarters for the wartime shipping organization would be in the United States rather than Europe.

Table 21: NATIONAL DEFENSE RESERVE FLEET—SEPTEMBER 30, 1981

Fleets	Retention ¹	Scrap Candidates	Special Programs	Totals
James River, Va.	107	19	41	167
Beaumont, Texas	46	1	5	52
Suisun Bay, Ca.	82	5	11	98
Total:	235	25	57	317²

¹ Vessel maintained for emergency activation under the fleet preservation program.

² Excludes one ship sold but not delivered, and the ATLANTIC BEAR moored alongside the James River Reserve Fleet.

Table 22: NATIONAL DEFENSE RESERVE FLEET, 1945–1981

Fiscal Year	Ships	Fiscal Year	Ships
1945	5	1964	1739
1946	1421	1965	1594
1947	1204	1966	1327
1948	1675	1967	1152
1949	1934	1968	1062
1950	2277	1969	1017
1951	1767	1970	1027
1952	1853	1971	860
1953	1932	1972	673
1954	2067	1973	541
1955	2068	1974	487
1956	2061	1975	419
1957	1889	1976	348
1958	2074	1977	333
1959	2060	1978	306
1960	2000	1979	317
1961	1923	1980	320
1962	1862	1981	317
1963	1819		

Table 23: MARINE AND WAR-RISK INSURANCE APPROVED IN FY 1981

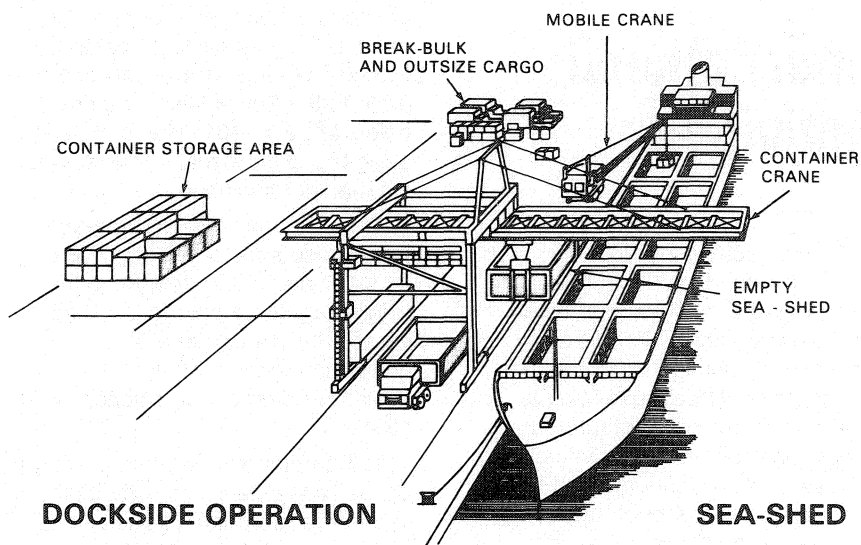
Kind of Insurance	Total Amount	Percentage	
		American	Foreign
Marine Hull and Machinery	\$7,160,165,000	61	39
Marine Protection and Indemnity	¹		
War-Risk Hull and Machinery	6,210,273,493	62	38
War-Risk Protection and Indemnity	6,210,273,493	62	38

¹ Protection and indemnity insurance coverage is obtained principally from international 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.

Industrial Preparedness

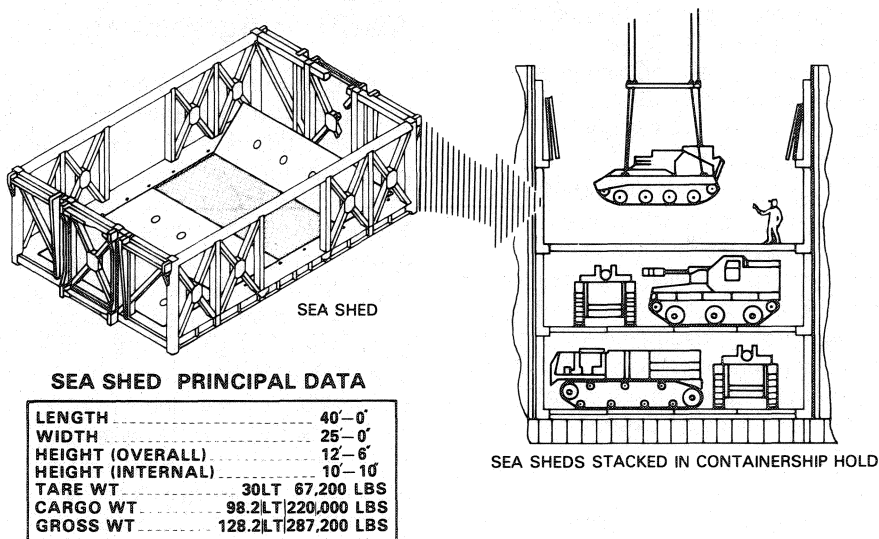
In FY 1981, MARAD extended and strengthened its participation in DOD's Industrial Preparedness Planning (IPP) Program to ensure that the industrial production base will be capable of satisfying marine material and equipment requirements in the event of a national emergency. Total planning at the subcontractor and vendor levels was increased. As of September 30, 1981, 2,000 agreements had been negotiated with 380 marine-related firms.

MARAD continued to support other Federal programs through utilization of data gathered in planning for marine requirements. The Agency developed several Industry Evaluation Board summary analyses for critical marine-related industrial sectors and helped DOD and the Department of Commerce identify defense-related problems in the industrial production base.



Artist's sketches illustrate dockside operation and stowage of Sea Shed concept for shipping oversized military cargoes in commercial-type container-ships. Project is part of joint effort by Maritime Administration and U.S. Navy to enhance military sealift capability of merchant fleet. Sea Sheds, in effect large containers, occupy three cells in container vessel; can carry tanks, other large vehicles and equipment.

SHED STOWAGE



Chapter 9

International Activities

During fiscal year 1981, the Maritime Administration (MARAD) participated in bilateral maritime discussions with the People's Republic of China (P.R.C.), the Soviet Union, Brazil, and Canada; took part in a number of international conferences; and continued to assist American maritime and trade interests abroad through the offices of its representatives in London, Brussels, Athens, Rio de Janeiro, and Tokyo.

U.S.-P.R.C. Maritime Agreement

The first meeting of U.S. and P.R.C. representatives since the formal signing of the 3-year Agreement on Maritime Transport between the United States of America and the People's Republic of China was held in Washington, D.C., from September 14 through September 19, 1981.

Among the topics discussed were cargo allocation, port access, service charges and conditions, consular matters, and the need for better communications between the designated representatives of the two Governments. The parties agreed to establish more direct communications on operational matters.

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

Designated representatives of the Governments of the United States and the Soviet Union held consultations in December 1980 to ensure effective implementation of the December 29, 1975, U.S.-U.S.S.R. Maritime Agreement.

They agreed to continue use of an index method to determine the monthly freight rate to be paid to U.S.-flag vessels for the carriage of grain to the Soviet Union during calendar year 1981. The formula is designed to be responsive to changing market conditions.

The U.S. and U.S.S.R. representatives also agreed to begin use of an index method to determine the freight rate to be paid to U.S.-flag vessels for the carriage of petroleum coke cargoes to the Soviet Far East during calendar year 1981.

The parties reviewed the carriage of liner and bulk cargoes by their respective merchant fleets for the 1979 accounting period, and agreed to make accommodations necessary to rectify any imbalances.

Consular and administrative problems arising under the terms of the agreement also were discussed. A memorandum of understanding was signed January 16, 1981.

Latin American Maritime Agreements

In October 1980, a MARAD delegation met with Brazilian maritime officials from the National Superintendency of Merchant Marine (SUNAMAM) and negotiated a 3-year extension of the equal access agreement between the two countries. The U.S.-Brazil agreement generally provides that each government will grant to the carriers of the other equal access to the carriage of its controlled cargo, i.e., cargo which would otherwise be reserved by law for carriage by its national lines. The agreement is scheduled to expire December 31, 1983.

The United States has a similar bilateral agreement with Argentina.

U.S.-Canada Cooperation

On June 18, 1981, U.S. and Canadian maritime representatives

signed a memorandum of understanding to cooperate in marine transportation research and development. The two countries agreed to exchange technical data and experiences and develop joint research projects in which tasks and costs are shared. The agreement, effective upon signing, will remain in force, subject to 12-months' written notice of termination by either party.

Agreements on two joint research projects were signed the same day. Under one, MARAD shares with the Canadian Marine Transport Administration (CMTA) information from 1969 and 1970 Arctic voyages of the ice-strengthened tanker SS MANHATTAN. Under the other, CMTA shares with MARAD information from the operation of the M/V ARCTIC, an icebreaking bulk carrier built under a joint Canadian Government-industry program.

International Conferences

MARAD was represented on the U.S. delegation to the 14th session of the Intergovernmental Maritime Consultative Organization (IMCO) Marine Environment Protection Committee (MEPC) held in London from November 10 through November 14, 1980. Agenda items included protective location of segregated ballast, oil/water separators and monitoring equipment, and preparation of the IMCO Comprehensive Anti-Pollution Manual. MARAD contributed significantly to the revision of the pollution-prevention section of the manual.

The Agency also continued to advise U.S. representatives to sessions of the United Nations Conference on the Law of the Sea on matters involving navigation and marine pollution control.

MARAD was represented at the 43rd and 44th sessions of the IMCO Maritime Safety Committee in London from December 1 through December 5, 1980, and from March 30 through April 3, 1981. The committee completed a comprehensive set of amendments to the 1974

Safety of Life at Sea Convention (SOLAS 1974) and a draft harmonized survey and certification scheme coordinating SOLAS 1974 and its 1978 Protocol, MARPOL 1973 and its 1978 Protocol, and the Loadline Conventions.

In all, during FY 1981 MARAD representatives participated in more than 30 regularly scheduled international conferences and a number of *ad hoc* discussions on international shipping matters.

In addition to IMCO, these included meetings of two other United Nations agencies, the Organization for Economic Cooperation and Development (OECD) and the United Nations Conference on Trade and Development (UNCTAD), which convene regularly to consider maritime subjects of mutual interest.

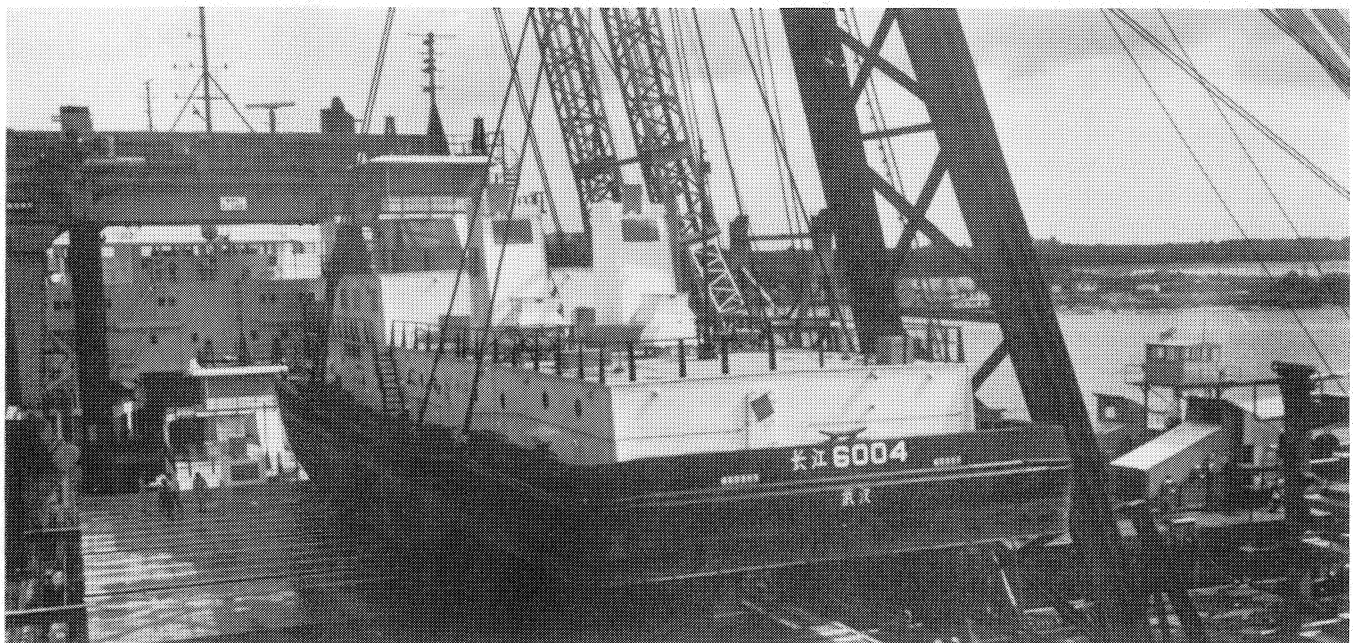
The Agency was represented at sessions of UNCTAD's Committee on

Shipping, OECD's Maritime Transport Committee, and the Special Group on International Organizations.

MARAD representatives also attended meetings of the North Atlantic Treaty Organization Planning Board for Ocean Shipping and five of its groups—the Defense Shipping Authority Study Group; the Shipping War Losses Working Group; the Plans Review Study Group; the Freight Rates Study Group; and the Allied Communications Agency, Merchant Ship Working Group.

Other meetings of this type attended by Agency representatives included the Consultative Shipping Group/United States Shipping Seminar, a planning committee for the Satellite Allied Distress Equipment Coordinated Trials program, a Marine and Port Technical Sales Seminar in the P.R.C., and the Oceans Law and Policy Seminar.

Towboat built by Dravo Mechling Corp. in Pittsburgh, Pa., is loaded aboard ship at New Orleans, La., for shipment to People's Republic of China (PRC). Six-thousand-horsepower vessel was one of four ordered from U.S. shipyard for operation on PRC rivers.



Administration

Maritime Subsidy Board

The Maritime Subsidy Board (MSB), by delegation from the Secretary of Transportation, 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. All MSB decisions, opinions, orders, rulings, and reports are subject to review by the Secretary of Transportation.

The Maritime Administrator is MSB Chairman. Other members are the Deputy Administrator and the Chief Counsel of the Maritime Administration (MARAD). The Secretary to MARAD and the MSB acts as an alternate member.

The MSB met 72 times in FY 1981. It considered and acted on 361 items; issued 38 formal opinions, rulings, and orders; and published 77 notices in the *Federal Register* on such matters as required statutory hearings and the development and adoption of rules and regulations to implement the Merchant Marine Act of 1936, as amended. The Secretary of MARAD, as Freedom of Information Act Officer and Privacy Act Officer, received and processed approximately 280 Freedom of Information Act requests and 50 Privacy Act requests.

During FY 1981, the MSB issued final orders in several formal proceedings regarding the applicability of Section 605(c) of the 1936 act to certain applications for operating-differential subsidy. Section 605(c) prohibits the award of subsidy for operations that would be in addition to existing U.S.-flag service unless it is determined that U.S.-flag service is inadequate and that the proposed additional service would further the purposes and policy of the act. Section 605(c) also prohibits the award

of subsidy for existing operations if such award would be unduly prejudicial to U.S.-flag competitors or the effect of such award would be to give the applicant undue advantage, unless it is determined after a hearing that U.S.-flag service is inadequate.

In a decision served on October 28, 1980, the MSB conditionally found that Section 605(c) was no bar to granting an application by Waterman Steamship Corp. for the privilege of making calls at ports in the U.S. Great Lakes, Egypt, South and East Africa, and Southwest Asia with vessels assigned to an existing subsidized service between U.S. Atlantic and Gulf ports and ports in India, the Persian Gulf and Red Sea. As of the close of the fiscal year, the application was pending resolution of other issues.

On December 12, 1980, the MSB served an order which found that Section 605(c) was no bar to the application of Farrell Lines, Inc., for subsidy to provide service between U.S. Atlantic ports and ports in Western Europe, the Mediterranean Sea and the Far East. The MSB subsequently approved the application and entered into a long-term subsidy contract with Farrell on December 30, 1980.

On January 9, 1981, the MSB approved an application of United States Lines, Inc., and on the same day entered into a long-term contract for U.S.-flag service between U.S. North Atlantic ports and ports in Western Europe. In an order served July 16, 1981, the MSB found that Section 605(c) was no bar to a subsequent application of United States Lines for subsidy to provide service between the U.S. Atlantic and Western Europe and the U.S. Atlantic and Pacific and the Far East. This application also was pending as the fiscal year ended.

On June 4, 1981, the MSB served an order which found Section 605(c) was no bar to the application of Delta Steamship Lines, Inc., for subsidy to provide privilege calls between ports in Southeastern Florida and ports in certain Caribbean countries in conjunction with Delta's existing service between U.S. Atlantic ports and ports in the

Caribbean. As of the end of the reporting period, the application was pending resolution of other issues.

With regard to ship construction, the MSB entered into a subsidized contract for two 34,000-deadweight-ton product carriers on January 19, 1981, and entered into a subsidized contract for the construction of one small inter-island trailer carrier on May 11, 1981. (See Chapter I.)

Administrative Law Proceedings

The function of MARAD's administrative law judge is to conduct public hearings necessitated by merchant marine and shipping statutes and prepare initial or recommended decisions.

Administrative law proceedings before the Agency have been greatly reduced. Only one matter was pending at the close of FY 1981. During this reporting period, the MARAD administrative law judge handled cases for other Agencies on a compensable loan basis.

Legal Services, Legislation, and Litigation

The Chief Counsel of the Maritime Administration, in addition to duties as a Maritime Subsidy Board member, provides the full range of legal services to all Agency offices, including those in Washington Headquarters, the four Regions, and the U.S. Merchant Marine Academy. During FY 1981, this effort involved the maritime assistance programs, domestic and international shipping matters, rulemaking, litigation, legislation, and numerous internal administrative issues.

One of the most significant events requiring legal efforts was the transfer of the Agency to the Department of Transportation. This required the analysis of all maritime and shipping laws, the drafting of

the transfer legislation (Public Law 97-31) and the revision of numerous regulations and other public and managerial directives. This administrative law work was continuing as the reporting year closed.

Approximately \$1 billion in guarantees were placed under Title XI of the Merchant Marine Act of 1936, as amended, in FY 1981. The total was about the same as the preceding period, but the number of transactions increased nearly 20 percent. In addition, a substantial number of closings involved leveraged leases, other sophisticated financial arrangements, and advances requiring complex legal analyses to assure that the security interests of the Government were preserved. The Chief Counsel, or his staff, assists program officials at every stage of processing, including active negotiations with applicants, their counsel, and participating financial institutions.

Legal assistance was rendered in support of several efforts to strengthen national defense, including the Maritime Prepositioning Ship program.

Several construction-differential subsidy (CDS) contracts for reconstruction of vessels, trade-in and use agreements, and operating-differential subsidy contracts were prepared and executed.

Legislative work during the year involved important maritime policy and budgetary measures and included the drafting of bills and related materials, preparation of testimony, analysis of bills as introduced, and review of Congressional correspondence. Principal efforts were directed at implementing the President's recommendations with respect to legislative matters affecting maritime commerce. Examples include the cargo preference program, deregulation, the status of ocean shipping conferences, and the Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35).

Efforts to reduce and to improve Agency regulations continued. The regulations subject to legal clearance include both rulemaking for the public and directives relating to management within the Agency.

Basic changes in subsidy programs required the preparation of regulations to permit subsidized operators to suspend operating contracts for periods of time and to take account of conditional permission to build ships abroad.

Litigation involving the Agency usually provides the opportunity for the Chief Counsel to share responsibility for the conduct of cases with the Department of Justice. The unique statutory authorities administered by MARAD have made such collaboration necessary, and the results have been recognized as beneficial to the Department of Justice and the Agency.

The following cases on the administration of MARAD's several assistance programs occurred during FY 1981.

A district court in *Great Lakes International v. Secretary of Commerce* held that plaintiff, a dredging company, had no standing to challenge Title XI loan guarantees approved for dredgers. An appellate court affirmed and, during the reporting year, the Supreme Court of the United States declined to review the case.

A district court in *Independent Tanker Owner's Committee v. Klutznick* upheld the Agency's action allowing removal of domestic trading restrictions on a tanker built with CDS upon repayment of that subsidy. It also upheld the Agency's interim rule on such repayments. Plaintiff's appeal was pending at year's end.

The case of *Alaska Bulk Carriers, Inc. v. Baldrige* could have a significant impact on the ability of the Agency to foster a modern merchant marine for commercial and defense purposes. Plaintiff is contesting award of CDS for two tankers which are to be chartered to the Military Sealift Command upon delivery. The case was pending at year's end.

Management Initiatives

A major headquarters reorganization placed the domestic shipping,

port and intermodal development, and market development activities under a new Associate Administrator for Marketing and Domestic Enterprise. The reorganization centralized the Agency's promotional programs, resulting in a single point of focus and improved promotional program direction.

Concurrent with this change, the position of Associate Administrator for Commercial Development was redesignated as the Associate Administrator for Research and Development with responsibility for application of the Agency's research and development programs to the U.S. shipbuilding and ship operating industries. Together, these changes enabled MARAD to improve its services in two major program offices.

During the year, a management review was conducted of the organization and procedural activities of the Office of Financial Management and changes made to the office's organizational structure and work flow.

Audits

The Office of the Inspector General, Department of Commerce, did not submit any internal audit reports to MARAD during the fiscal year.

The General Accounting Office submitted one letter report, *United States Lines, Inc.'s Operating-Differential Subsidy Agreement, Contract No. MA/MSB 483, Trade Route 5-7-8-9, September 1981*. This report was for informational purposes and did not include recommendations.

Financial Analysis

MARAD continued development of its financial analysis capabilities with the completion of software for the Financial Information and Retrieval System for non-liner companies (FIRST XI). Together with

FIRST, which is oriented toward liner shipping, FIRST XI will permit MARAD to examine financial information relating to all industry segments.

A computer program to separate and analyze corporate balance sheet accounts was developed during the period and will be integrated into FIRST and FIRST XI. This program will allow comparisons over time for individual companies and industry segments.

Also during FY 1981, MARAD completed a study evaluating the effect of vessel replacement programs on U.S.-flag liner company balance sheets and income statements.

In addition, the Agency began an analysis of potential effects of trade rationalization and increased capacity utilization on revenues, expenses, and profit margins of the U.S.-flag liner companies.

Management Information

MARAD continued to expand the use of automatic data processing (ADP) in support of nearly all Agency components in FY 1981.

During the period, for example, an analysis of foreign-flag competition was completed in just 6 months. Previously, several years had been required. This information is vital to accurate and timely payment of operating subsidies.

Also in support of the operating subsidy program and the industry, the Maritime Administration Trade System was expanded and enhanced to eliminate the need for berth liner operators to maintain detailed records in meeting requirements under 46 CFR, Part 280.

Another ADP subsystem under development in FY 1981 could play a significant role in determining principal foreign-flag competition for U.S. ship operators.

To help waterborne carriers obtain a fair share of available cargo, a cargo availability system was implemented.

National defense planning was supported during FY 1981 military exercises. Programs and data bases used were monitored and updated to ensure that exercise material was realistic.

Systems to augment the Agency's port information were expanded to meet both national defense needs and peacetime requirements.

During the year, MARAD implemented many changes to its payroll and personnel systems to reflect new legislation and requirements.

As part of the transfer of the Agency to the Department of Transportation, plans were made to move MARAD's computer to the Transportation Computer Center early in FY 1982.

Personnel

MARAD employment declined from 1,381 to 1,329 in FY 1981. Position vacancies were eliminated and staffing adjustments were made to accommodate changes in priorities of specific programs.

In spite of limited employment activity, the percentage of female and minority employees in the Agency increased and their representation in supervisory positions remained stable. A decline in the percentage of handicapped employees was attributable to retirements.

Five upward mobility positions were established during the period.

In FY 1981, total MARAD employee attendance at formal Agency-sponsored training programs was approximately 1,500. Emphasis continued to be placed on in-house training. Fifty courses were offered within the Agency's facilities. The use of nontraditional instruction methods, such as programmed texts and video and audio tapes, was increased.

During the period, 14 MARAD employees received high honors. One Gold Medal, four Silver Medals, and nine Bronze Medals were awarded. Performance awards were

made to 143 Agency employees. These included 45 quality step increases and 62 special achievement awards.

A merit pay system was implemented during the year, with approximately 240 employees covered under the initial merit pay cycle. MARAD's overall performance-based pay increase averaged 5.7 percent.

The number of employees represented by recognized labor unions remained stable during the year. Mid-term negotiations were conducted with two of six bargaining units. Four unfair labor practice charges made by unions were dismissed or settled prior to any complaint being issued by the Federal Labor Relations Authority. The Federal Service Impasses Panel found in favor of management on a disputed contract provision and, in a precedential decision, it required parties to conduct some negotiations outside duty hours.

Installations and Logistics

Real Property

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

Radar training schools were operated at San Francisco, Calif.; New Orleans, La.; Toledo, Ohio; Seattle, Wash.; and New York, N.Y.; and facilities for training maritime firefighters at Earle, N.J.; Treasure Island, Calif.; and New Orleans. A new facility for training maritime firefighters was under construction at Toledo. Regional offices were operated in San Francisco; Cleveland, Ohio; New Orleans; and New York City. Market Development offices were maintained in Long Beach, Calif.; Chicago, Ill.; Seattle;

Houston, Tex.; Atlanta, Ga.; and in the four regional headquarters.

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

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

Accounting

MARAD's accounts were 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 \$457.2 million. This included \$436.3 million for operating-differential subsidy and construction-differential subsidy, \$20.4 million for research and develop-

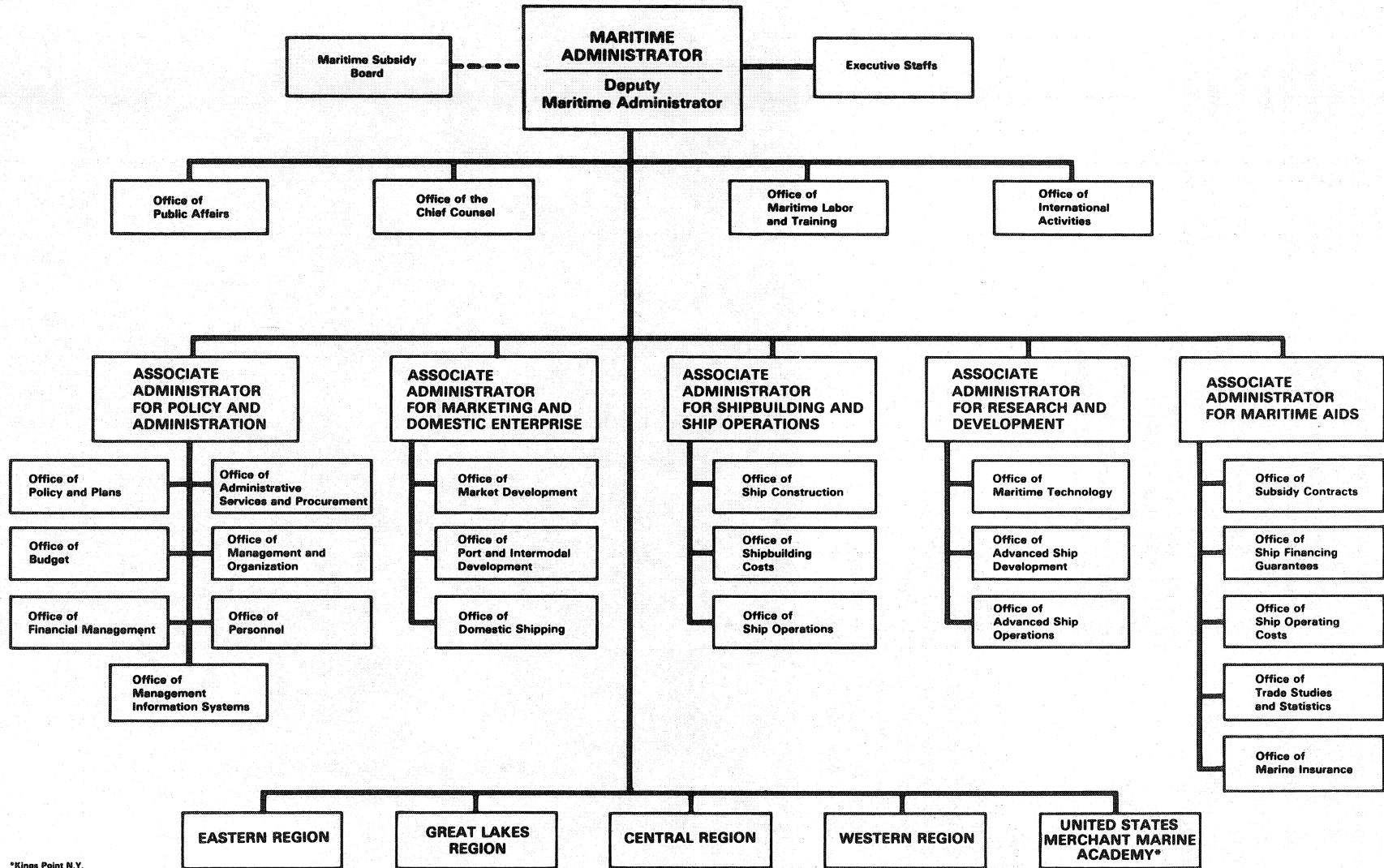
ment, \$26.3 million for administrative expenses, \$6.9 million for maintenance and preservation of reserve fleet vessels, and \$7.3 million for financial assistance to State maritime academies. MARAD received \$40 million in other operating income, net of expenses.

Financial statements of the Agency appear as Exhibits 1 and 2.

Ex-SEA-LAND COMMERCE (shown here while still in commercial service) is one of eight SL-7 class containerships acquired by U.S. Naval Sea Systems Command for conversion into fast logistics vessels (T-AKR(X)) supporting rapid deployment of highly mechanized Army combat and support equipment on worldwide basis. Ships can operate at 33 knots.



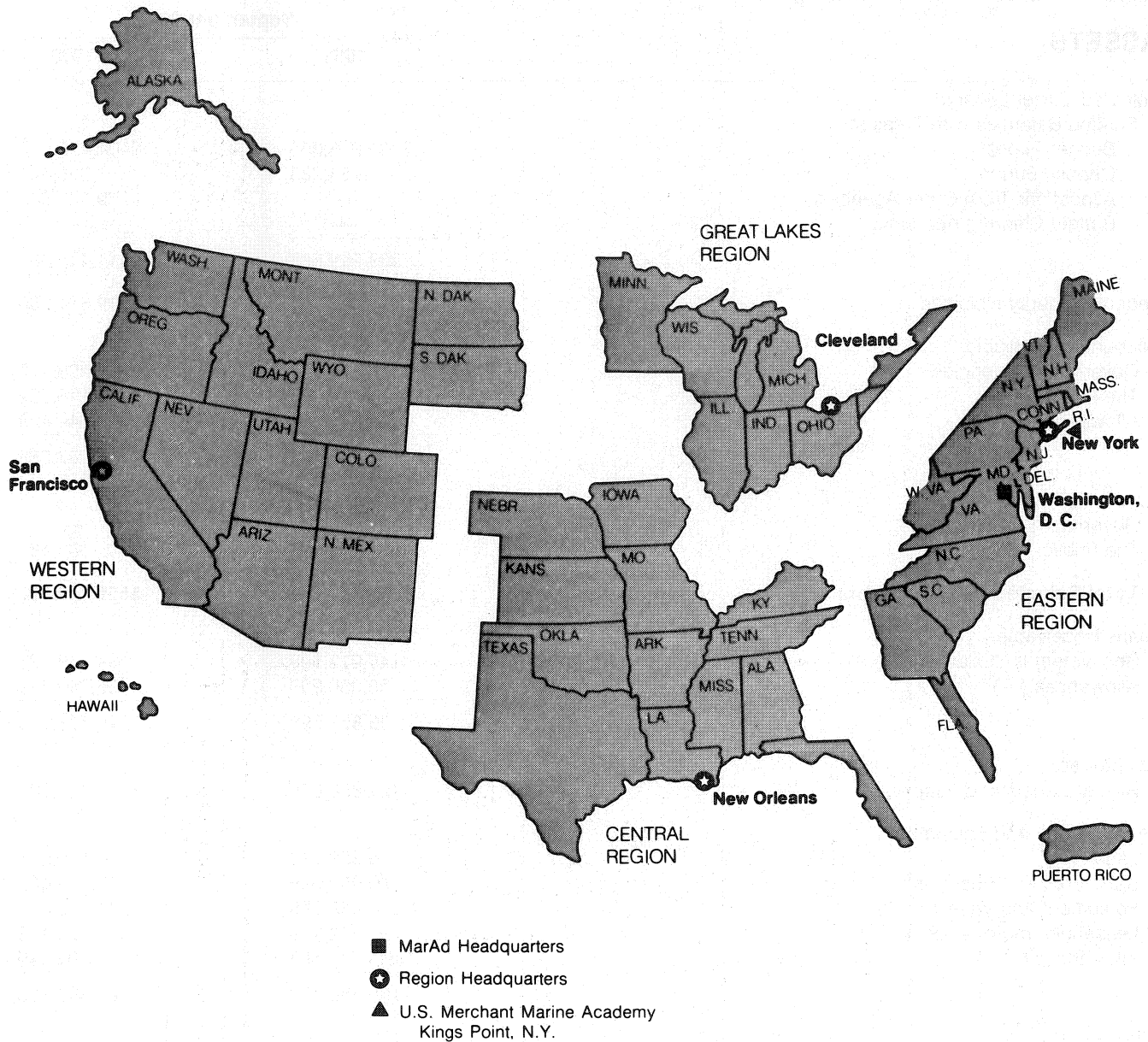
Maritime Administration Organization Chart



*Kings Point N.Y.

Maritime Administration

Field Organization



FINANCIAL STATEMENTS

U.S. Department of Transportation—Maritime Administration

Exhibit 1. Statement of Financial Condition

September 30, 1980, and September 30, 1981

ASSETS	September 30	
	1981	1980
Selected Current Assets		
Funded Balances with Treasury:		
Budget Funds	\$339,016,355	\$404,476,852
Deposit Funds	283,283	366,471
Allocations from Other Agencies	—	9,572,645
Budget Clearing Accounts	—	—
	<u>339,299,638</u>	<u>414,415,968</u>
Federal Security Holdings	166,286,000	139,671,000
Accounts Receivable:		
Government Agencies	7,875,563	4,968,172
The Public	119,265	2,148,322
Allowances (—)	<u>645,036</u>	<u>2,049,429</u>
	<u>7,349,792</u>	<u>5,067,065</u>
Advances To:		
Government Agencies	—	—
The Public	83,983	108,187
Total Selected Current Assets	\$513,019,413	\$559,262,220
Loans Receivable:		
Repayment in Dollars	145,912,598	134,719,326
Allowances (—)	<u>— 55,060,999</u>	<u>— 55,940,521</u>
	<u>90,851,599</u>	<u>78,778,805</u>
Inventories:		
Raw Materials and Supplies	21,868,625	5,481,281
Real Property and Equipment:		
Land	6,382,879	6,419,234
Structures and Facilities	40,086,038	39,415,625
Equipment and Vessels	1,273,438,686	1,251,225,407
Leasehold Improvements	92,119	92,119
Allowances (—)	<u>— 1,211,111,589</u>	<u>— 1,202,302,229</u>
	<u>108,888,133</u>	<u>94,880,156</u>
Other Assets:		
Works-in-Process—Other	13,270,513	9,802,166
Material and Supplies	787,401	787,880
Non-Current Assets	5,744,806	4,262,443
Notes Receivable	26,357,213	25,791,364
Allowances (—)	<u>— 121,102</u>	<u>— 121,102</u>
	<u>46,038,831</u>	<u>40,522,751</u>
Total Assets	\$780,666,601	\$778,925,213

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

FINANCIAL STATEMENTS

U.S. Department of Transportation—Maritime Administration

LIABILITIES	September 30	
	1981	1980
Selected Current Liabilities (Note 2)		
Accounts Payable (Including Accrued Liabilities):	\$ 2,287,036	\$ 2,167,311
Government Agencies	170,713,965	160,370,875
The Public	173,001,001	162,538,186
Advance From:		9,706,048
Government Agencies	25,551,573	17,216,341
The Public	25,551,573	26,922,389
Total Selected Current Liabilities	\$198,552,574	\$189,460,575
Deposit Fund Liabilities	283,283	366,471
Unfunded Liabilities:		
Accrued Annual Leave	2,978,513	2,829,484
Other Liabilities:		
Vessel Trade-In Allowance and other accrued liabilities	2,613,739	8,095,703
Total Liabilities	\$204,428,109	\$200,752,233
Government Equity Unexpended Budget Authority:		
Unobligated	207,767,833	252,796,639
Undelivered Orders	265,699,062	268,522,703
	473,466,895	521,319,342
Unfinanced Budget Authority (—):		
Unfilled Customer Orders	— 10,062,376	— 2,747,998
Contract Authority	— 149,220,963	— 149,136,172
	— 159,283,339	— 151,884,170
Invested Capital	262,238,492	208,737,808
Total Government Equity	\$576,238,492	\$578,172,980
Total Liabilities and Government Equity	\$780,666,601	\$778,925,213

The notes and schedules 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, 1980, and September 30, 1981

	Years Ended September 30	
	1981	1980
OPERATIONS OF THE MARITIME ADMINISTRATION:		
Net Costs of Operating Activities		
Reserve Fleet Programs:		
Depreciation on Vessels	\$ 4,595,461	\$ 340,562
Maintenance and Preservation	6,955,375	6,624,273
	<u>11,550,836</u>	<u>6,964,835</u>
Maritime Training Program	\$ 15,176,089	\$ 14,151,735
Maintenance of Shipyard and Warehouse	\$ 62,597	\$ 13,332
Direct Subsidies and National Defense Costs:		
Operating-Differential Subsidies	333,280,790	319,708,815
Construction-Differential Subsidies	103,045,492	226,986,682
Costs of National Defense Features	1,515,550	1,808,384
	<u>\$437,841,832</u>	<u>\$548,503,881</u>
Administrative	26,262,528	28,968,906
Research and Development	20,354,364	24,332,028
Financial Assistance to State Marine Schools	7,288,655	9,177,751
	<u>\$ 53,905,547</u>	<u>\$ 62,478,685</u>
Other Costs (Net of Income):		
Income on Sale of Obsolete Vessels	- 3,643,949	- 2,952,127
Loss on Sale of Other Assets	- 6,556	1,184,593
Inventory and Property Adjustments	869,681	202,559
Interest Income	- 3,022	- 2,623,534
Miscellaneous (Net)	8,640,638	1,290,440
	<u>5,856,792</u>	<u>- 2,898,069</u>
Net Cost of Maritime Administration Operations	<u>\$522,667,443</u>	<u>\$629,214,399</u>
OPERATIONS OF REVOLVING FUNDS (– Income):		
Vessel Operations Revolving Fund	– \$15,174,025	\$ 489,904
War-Risk Revolving Fund	700,514	– 713,222
Federal Ship Financing Fund, Revolving Fund	– 50,991,711	– 42,219,628
Net Cost of Combined Operations	<u>\$457,202,221</u>	<u>\$586,771,453</u>

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

U.S. Department of Transportation—Maritime Administration

Notes to Financial Statements—September 30, 1981, and September 30, 1980

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 insuring mortgages and construction loans payable to lending institutions totaling \$6,567,719,056 on September 30, 1981, and

\$5,932,663,342 on September 30, 1980. Commitments to insure additional loans and/or mortgages amounted to \$1,275,138,919 on September 30, 1981 and \$1,261,412,967 on September 30, 1981 and \$308,559,219 on September 30, 1981, were held in escrow by the Government in connection with insurance of loans and mortgages which were financed by the sale of bonds to the general public. There were no conditional

liabilities for prelaunching War-Risk Builder's Risk Insurance on September 30, 1981.

3. On September 30, 1981, the U.S. Treasury held in safekeeping for the Maritime Administration \$180,000 of U.S. Government securities which had been accepted from vessels, charterers, subsidized operators, and other contractors as collateral for their performance under contracts. On September 30, 1980, the amount was \$180,000.

Appendix I: MARITIME SUBSIDY OUTLAYS—1936–1981

Fiscal Year	CDS	Reconstruction Subsidy	Total	ODS	Total ODS & CDS
1936–1955	\$ 248,320,942 ¹	\$ 3,286,888	\$ 251,607,830	\$ 341,109,987	\$ 592,717,817
1956–1960	129,806,005	34,881,409	164,687,414	644,115,146	808,802,560
1961	100,145,654	1,215,432	101,361,086	150,142,575	251,503,661
1962	134,552,647	4,160,591	138,713,238	181,918,756	320,631,994
1963	89,235,895	4,181,314	93,417,209	220,676,685	314,093,894
1964	76,608,323	1,665,087	78,273,410	203,036,884	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	111,950,430	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	412,279,427
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
Total	\$3,332,255,535	\$213,674,103	\$3,545,929,638	\$6,158,875,522	\$9,704,805,160

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, 1980, and 1979¹ (Amounts Stated in Thousands of Dollars)

ASSETS	1980	1979
Current Assets:		
Cash	\$ 19,406	\$ 32,388
Marketable Securities	92,862	75,556
Accounts Receivable	358,876	376,075
Other Current Assets	59,230	46,502
Total Current Assets	\$ 530,374	\$ 530,521
Special Funds and Deposits	209,528	163,080
Investments	30,228	20,701
Deferred ODS Receivable (See Contra) ²	—0—	(31)
Property and Equipment Less Depreciation:		
Vessels	1,111,062	982,380
Other Property and Equipment	364,533	268,693
Other Assets	160,517	163,547
TOTAL ASSETS	\$2,406,242	\$2,128,891
LIABILITIES AND STOCKHOLDERS' EQUITY		
Liabilities:		
Current Liabilities:		
Accounts and Notes Payable	\$ 258,745	\$ 270,017
Current Portion of Long-Term Debt	36,625	21,829
Other Current Liabilities	185,102	159,946
Total Current Liabilities	\$ 480,472	\$ 451,792
Voyages in Progress (Net)	93,497	77,621
Long-Term Debt	967,913	774,559
Recapture ODS (See Contra) ²	—0—	(31)
Other Liabilities	173,302	194,599
Total Liabilities	\$1,715,184	\$1,498,540
Stockholders' Equity:		
Capital Stock	85,071	85,745
Paid-in Capital	169,825	170,510
Retained Earnings	436,162	374,096
Total Stockholders' Equity	\$ 691,058	\$ 630,351
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	\$2,406,242	\$2,128,891

¹ Data from Forms MA-172 filed by 18 subsidized companies.

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

Appendix II: (Continued)

Statement B—Combined Condensed Income and Retained Earnings for the Years Ending December 31, 1980, and 1979
(Amounts Stated in Thousands of Dollars)

	1980	1979
Shipping Operations:		
Revenue:		
Terminated Voyages	\$2,340,607	\$1,928,217
Other Shipping Operations	12,503	6,359
Total Revenue	<u>\$2,353,110</u>	<u>\$1,934,576</u>
Expenses:		
Vessel Expense	\$1,121,003	\$ 955,106
Operating-Differential Subsidy (ODS)	(334,907)	(312,044)
Voyage Expense	1,084,204	910,710
Total Vessel/Voyage Expense (Net of ODS)	<u>\$1,870,300</u>	<u>\$1,553,772</u>
Overhead	\$ 233,078	\$ 197,713
Depreciation and Amortization on Shipping Property and Equipment	90,161	66,994
Other Expenses	10,968	16,618
Total Expenses	<u>\$2,204,507</u>	<u>\$1,835,097</u>
Shipping Operations Gross Profit	\$ 148,603	\$ 99,479
Other Income	51,981	28,795
Other Deductions	(92,355)	(73,765)
Shipping Operations Net Profit	\$ 108,229	\$ 54,509
Non-Shipping Operations Net Profit (Loss)	(1,013)	(363)
Ordinary Income Before Income Taxes	\$ 107,216	\$ 54,146
Provision for Income Taxes	(22,586)	(16,379)
Ordinary Income After Income Taxes	\$ 84,630	\$ 37,767
Extraordinary Items—Income (Expense)	34,612	(379)
Income Taxes Thereon (Expense)	-0-	-0-
NET INCOME	\$ 119,242	\$ 37,388
Retained Earnings Beginning of Year ¹	\$ 374,781	\$ 382,998
Changes:		
Dividends	(53,300)	(48,495)
Other	(4,561)	2,205
RETAINED EARNINGS END OF YEAR¹	\$ 436,162	\$ 374,096

¹ Difference between 1979 Retained Earnings ending balance and 1980 Retained Earnings beginning balance is due to various accounting adjustments.

Appendix III: RESEARCH AND DEVELOPMENT CONTRACTS AWARDED—FISCAL YEAR 1981

Projects	Task	Vendor	Contract Number	Amount
Advanced Ship Development				
Shipbuilding Research:				
REAPS*	To continue the support for widespread implementation of advanced technology to U.S. shipbuilders to assist in the reduction of building costs and to improve productivity of the industry.	IIT Research Chicago, Ill.	MAH-11009	\$ 88,337
Development and Implementation of Advanced Shipbuilding Methods*	To assist U.S. shipyards develop and implement more efficient systems and procedures to improve productivity and to reduce construction cycle time.	Avondale Shipyards New Orleans, La.	MAH-11003	511,860
Improved Outfit and Production Aids*	To develop and prepare handbooks and work manuals on the logic, principals, and production engineering methods for new shipbuilding technology.	Todd Shipyards Seattle, Wash.	0-01107	160,000
Shipbuilding Standards Research*	To develop long range plans for standards development program and to develop standard specifications for piping.	Bath Iron Works Bath, Maine	0-01106	245,000
Industrial Engineering*	To develop and produce a Work Management Manual for labor standards; the Shipyards Methods/Labor Standards, and Shipyard Industrial Engineering Program.	Bath Iron Works Bath, Maine	0-01105	1,072,802
Ship-Cost Estimating Phase I*	Develop and demonstrate a computer-aided estimating capability for shipbuilding, including computer programs for estimating ship costs and documentation to install, use, and service the computer software.	National Steel and Shipbuilding Co. San Diego, Calif.	7-38052	73,900
Improved Productivity in the Surface Preparation and Coating of Ships*	To increase productivity and decrease the cost of the surface preparation and coating of steel during ship construction.	Avondale Shipyards, Inc. New Orleans, La.	1-10011	470,000

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Ship Machinery & Outfitting:				
Protective Covering System for Steel Propellers, Phase I*	Develop and demonstrate an adequate protective covering system for steel propellers in order to replace bronze propellers on ships and thereby reduce both manufacturing and operating costs.	Daedalean Assoc. Woodbine, Md.	7-38048	\$216,400
Auxiliary and Support Piping	The application of nondestructive testing techniques to identify degradation/failure of cargo piping.	Daedalean Assoc. Woodbine, Md.	9-00070	25,000
Domestic Bulk Fleet Rehabilitation and Modernization*	To evaluate the technical and economic merits of retrofitting diesel propulsion systems in T-2 tankers.	GATX GARD, Inc. Niles, Ill.	1-10045	121,000
Atomization & Combustion of PETCOM (Petroleum, Coal/Oil Mixture)*	To determine the atomization and combustion characteristics of PETCOM fuels and their impact on boiler operation, performance and maintenance.	Combustion Engineering, Inc. Windsor, Conn.	1-10044	419,465
Machinery Conditioning Monitoring Technique, Phase II	To conduct research on techniques for detecting ship's machinery wear so as to provide a basis for permitting the introduction of flexibility to the intervals between machinery overhauls and to reduce unscheduled down time.	Mara-Time Services Corp. Northport, N.Y.	MA5-0147	149,820
Coal-Fired Steam Turbine	To prepare a report of M&R criteria and related cost data for use in maintenance and repair analysis of coal fired steam turbine propulsion systems.	Santa Fe Corp. Alexandria, Va.	1-10028	90,843
Advanced Stern Seals for Shafting U.S. Merchant Vessels*	To develop and test new data under the simulated ship operating conditions acquired using project developed equipment to provide a basis for improved decisions on seal/liner design and manufacture.	Mechanical Tech. Inc. Latham, N.Y.	1-10039	202,029

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Environmental Factors Influencing Coal as Marine Boiler Fuel	To develop qualitative and quantitative data associated with stack gas emissions and ash discharge from coal fired steam turbine propelled ships and the impact the affluents have on the environment.	Versar, Inc. Springfield, Va.	1-10020	73,373
Future Availability of Residual Fuels	To determine the future availability of residual fuels for use as marine bunker fuel in merchant ships and to assess the impact a shortfall of fuel may have on the commercial shipping operations.	Mitnick Associates Washington, D.C.	1-10003	57,203
Fossil Coal Characteristics	To define the various grades and sources of coal within the United States, Australia, and South Africa and to assess their stability for use in coal-fired steam turbine propelled ships and determine the cost impact of boiler operations.	Esca-Tech Corp. Anchorage, Alaska	1-10005	48,779
Tank Level Indicating System	To develop recommended guidelines and criteria for the design, testing and certification of tank level indicating systems.	Southwest Research Institute San Antonio, Tex.	8-3067	8,739
Port/Vessel Coal Bunkering Facilities	To conduct a comparative analysis of the various port/vessel coal bunkering alternatives at a selected U.S. port inclusive of the financing requirements and rate of financial return for the market share of the facilities examined. Alternative configurations will be prepared for each location.	Econ, Inc. Princeton, N.J.	1-10027	116,131
Coal Fired Propulsion Dynamics*	To develop engineering specifications for merchant vessel operating companies and shipyards for specifying and procuring equipments and controls for coal fired turbine propulsion systems.	General Dynamics Quincy, Mass.	1-10030	98,069
Shipboard Coal and Ash Handling Systems*	To develop the qualitative, quantitative and technical engineering specifications for equipment and component parts required for shipboard coal and ash handling.	Macawber Engineering Inc. Maryville, Tenn.	1-10022	117,800

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Application of Silicon Control Rectifier to Shipboard Machinery	To determine the feasibility of using silicon rectifier control coupled with AC/DC non-commutating motors as drives for pumps, fans, and other electrical marine equipment to replace the present system of marine control techniques.	Alexander Kuskow, Inc. Needham Heights, Mass.	1-10006	\$ 75,844
Machinery Monitoring Diagnostic Systems Requirements for Marine Diesel Engines	To conduct an extensive evaluation to produce identification, monitoring and diagnostic system requirements of shipboard machinery.	Seaworthy Engines Systems Essex, Conn.	1-10004	84,000
Advanced Ship Operations				
Fleet Management:				
International Data Communication/Maritime Communication Center Interface*	To purchase communication equipment to participate in the testing of IDCS interface with the Maritime Communication Center.	Council of American-Flag Operators Washington, D.C.	MAH-11001	421,624
Equipment Maintenance and Repair System	To develop an automated control system for the management, maintenance and repair of marine cargo systems.	Puerto Rico Maritime Shipping Authority San Juan, P.R.	1-10019	89,333
Shipping Operations Management	To perform a functional system design of a Shipping Operations Management System to assist the U.S. National Shipping Authority in marshalling and operating ships in non-NATO contingencies and in non-NATO war conditions.	Information Spectrum Inc. Cherry Hill, N.J.	1-10036	73,477
Vessel Vital Signs Monitoring System	To test and evaluate the present location of sensors onboard certain merchant vessels and to obtain, test and evaluate alternative sensors at new locations and associated software for reporting data.	American Commercial Barge Lines Jeffersonville, Tenn.	1-10032	147,545
Shipping Management Technology Transfer	To provide computertime and customer support services to aid in the transfer of research and development project results to U.S.-flag shipping companies.	General Electric Information Service Co. Rockville, Md.	MAH-11002	150,000
Inventory Management of Ship Spare Parts, Phase II	To conduct full-scale tests of the inventory and procurement system and to test the ongoing inventory and re-stocking system for integration with shoreside procurement and reporting to management.	Sun Transport, Inc. Asten, Pa.	1-10071	151,995

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Distributive Data Processing	To develop new technology of distributive data processing in a Systems Master Plan to provide management and customer with timely and accurate operational and financial information tailored to their individual requirements.	U.S. Lines, Inc. New York, N.Y.	MAH-11004	\$308,927
Cargo Handling:				
SEA-SHED Test and Evaluation	To plan for the merger of the SEA-SHED program and the Navy's Sealift Enhancement Program.	Information Spectrum Arlington, Va.	0-01090	65,355
Technical Tasks for Research and Development Cargo Handling	To provide and develop a plan for conducting research and development of waterborne cargo handling.	Advanced Tecnology, Inc. McLean, Va.	0-01049	70,000
Amphibious Logistics System	To explore alternative sources for obtaining personnel to train for staffing Navy/Marine cargo discharge facilities.	M. Rosenblatt & Son Arlington, Va.	0-01090	17,000
Self-Unloaders for U.S. Dry-Bulk Vessels	To examine the economic and operational feasibility of the application of self-unloading cargo handling systems for U.S. dry-bulk ocean carriers.	COR, Inc. Falls Church, Va.	0-01068	70,864
SEA-SHED Test and Evaluation and Prototype Demonstration*	To construct, test and evaluate a prototype SEA-SHED to determine the adequacy of the design and to conduct an evaluation of the operational analysis under actual conditions of placing four SEA-SHED units aboard ship and loading cargo aboard each unit.	Information Spectrum, Inc. Cherry Hill, N.J.	0-01091	1,276,455
Ship Performance & Safety:				
Ship's Bridge Design and Retrofit of Automated Bridge Equipments	To design and evaluate advanced bridge designs for their effectiveness and human factors.	Electech Associates, Inc. North Stonington, Conn.	1-10015	178,725
Assessment of Asbestos Exposure in the Reserve Fleet	To assess the degree to which MARAD's fleet personnel are exposed to asbestos contamination.	IIT Research Institute Chicago, Ill.	1-10050	79,913
Copper-Nickel Hull Sheathing	To conduct tests and to evaluate application of copper-nickel sheathing to ships hulls as a solution to the problems associated with keeping hulls clean and free from corrosion.	Copper Development Association New York, N.Y.	1-10074	75,000

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Optimum Ship Routing	To construct, test and evaluate the stress monitoring and guidance system installed aboard the U.S.N.S. FURMAN.	Hoffman Maritime Consultants, Inc. Glen Head, N.Y.	MA5-0133	\$ 91,004
Ship Speed Performance Monitoring System	To provide ship operators with proven technology that will allow the separation, identification, and quantification of causes of ship speed/fuel losses so that corrective measures can be applied.	Bearing Technology, Inc. Charlottesville, Va.	MA5-0153	164,970
Office of Maritime Technology				
Advanced Ship Systems:				
A Consistent Eleven-Year Time Series for Forecasting U.S. Foreign Trade	To develop an eleven-year time series of U.S. foreign trade for use by MARAD and U.S.-flag carriers in forecasting U.S. foreign trade.	Manalytics, Inc. San Francisco, Calif.	1-0038	62,406
Development of Alaskan Gas & Products	To investigate opportunities for marine systems to be used to transport Alaskan natural gas and gas products.	ICF Washington, D.C.	1-0047	126,436
Maritime Transportation Research Board*	To assist the sponsoring agencies (MARAD, U.S. Coast Guard) in defining maritime research requirements and new direction.	National Academy of Sciences Washington, D.C.	1-10043	330,000
Feasibility of Marine Transportation of Alaskan Coal	To develop design criteria for ships carrying Alaskan coal, and to determine the feasibility of an advanced technology U.S.-flag coal carrier.	Hydronautics, Inc. Laurel, Md.	SAH-11006	94,145
Arctic Ice Atlas	To provide a baseline of Arctic ice conditions to support the Arctic Marine Transportation Research Program and to aid in the design of icebreakers and terminals for Arctic shipping.	University of Alaska Anchorage, Alaska	SAH-11010	109,397
Atlantic Coal Transportation	To study the use of a coal slurry technology to transport Eastern U.S. coal to Western European markets.	Boeing Engineering Seattle, Wash.	SAH-11007	118,293

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Multi-Mode Express Shipping	To evaluate the economics of two mode operations of high performance surface vessels.	International Maritime Assoc. Washington, D.C.	1-10007	\$110,647
Modular Industrial Plant Systems	To identify plant systems which can be constructed in U.S. shipyards and readily transported by vessel to remote sites.	Simat, Helliesen & Eichner, Inc. Washington, D.C.	1-10035	92,485
Analysis of Issues Relating to Economic Impact of Inland Waterway User Charges	To determine the economic impact of fuel taxes imposed on commercial users of inland waterways particularly with respect to (1) prices of commodities transported; (2) U.S. balance of payments in foreign trade; (3) the economic feasibility of inland waterway improvement projects; (4) the comparative levels of benefits to commercial and general public users; and (5) the need for Federal assistance to agricultural, industrial and other interests.	U.S. Department of Transportation, Office of the Assistant Secretary for Policy and International Affairs, Washington, D.C.	400-19005	87,500
Opportunities for U.S.-Flag Chemical and Product Tankers	To investigate the development of a new Government/Industry relationship for the creation of a U.S. bulk fleet.	International Maritime Assoc. Washington, D.C.	1-10075	39,049
National Defense Relevance of the U.S. Dry-Bulk Fleet	To determine the defense roles that could be served by dry-bulk ships, and to determine the characteristics of vessels which enhance their defense relevance.	M. Rosenblatt & Son New York, N.Y.	1-10052	80,520
R&D Achievements of the Seventies	To prepare a report of MARAD's Research and Development Achievements for the period 1970 through 1980.	Mantech International CADCOM Div. Annapolis, Md.	7-38084	65,250
Research and Development Report Cataloging	To index, catalog and process MARAD's Research and Development reports.	Tracor-Jitco Rockville, Md.	P.O. 1-2331	4,000
Presidential Oil Pollution Insurance Study	To tabulate questionnaire data on the availability of oil pollution insurance coverage.	Granville Corp. Washington, D.C.	P.O. 1-2110	8,700
Maritime Pre-positioning Ship Design	To prepare a detailed list of material and quantity for the Maritime Pre-positioning Ship.	M. Rosenblatt and Son, Inc. Arlington, Va.	9-00064	33,405
Maritime Pre-positioning Ship Design	To prepare the final configuration design to the Maritime Pre-positioning Ship.	M. Rosenblatt and Son, Inc. New York, N.Y.	9-00064	349,977

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Mobilization Ship Phase III Model Tests	To re-design and model test a bow bulb to optimize ship resistance and to reduce life-cycle fuel costs.	Hydronautics, Inc. Laurel, Md.	9-00053	\$ 33,010
Marine Science:				
Ship Structural Research	To conduct research in advance technology in ship design, fabrication methods, materials, structural loads and response and advanced concepts.	U.S. Coast Guard Washington, D.C.	400-19001	175,000
Collapsing Bow of a Striking Ship	To develop a methodology for analyzing the collapsing bow of a striking ship.	Hydronautics, Inc. Laurel, Md.	0-01051	82,317
Ship Structure Committee Publication Abstract Reports	To obtain a copy of the Ship Structure Committee Abstract Reports.	National Academy of Science Washington, D.C.	1-2134	3,920
Arctic Transportation Trafficability Tests, Phase III	To conduct Phase III of the Trafficability Tests and to perform a winter probe to Prudhoe Bay on the North Slope, and to continue the operational assessment of commercial ice-breaking ships.	Arctec, Inc. Columbia, Md.	1-10023	146,000
Operational Assessment of Commercial Ice-Breaking Tests	To continue the operational assessment of commercial icebreaking ships in Alaskan waters. To plan for northwest Passage Transit of a POLAR-CLASS ice-breaker during the winter of 1983.	Arctec, Inc. Columbia, Md.	1-10023	29,502
Operational Assessment of Commercial Ice-Breaking Tests	To install automated data collection equipment, collect and analyze data obtained on ship hull structures in actual ice operating conditions and to obtain from towing and bollard pulls. Phase III—Winter 1982.	Arctec, Inc. Columbia, Md.	1-10023	111,978
Semi-Empirical Ice Resistance Prediction*	To develop a semi-empirical relationship which best describes the resistance of ice-transiting ships. The relationships will be based on an analysis and comparison of all available full-scale, model test, and analytical formulations conducted to date in the U.S. and Canada.	Arctec, Inc. Columbia, Md.	1-10014	48,000

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Polar Class Trafficability Tests Phase III	To define the environmental conditions which affect navigation and to predict the operational performance of future commercial ice-breaking ships operating along certain trade routes in the Bering and Chukchi Sea.	Arctec, Inc. Columbia, Md.	1-10038	\$250,000
Ship Resistance from In-Plane Ice Pressure	To conduct literature search and develop an analytical model to examine the effect of in-place ice pressure as it influences ship resistance to ice.	Society of Naval Architects and Marine Engineers New York, N.Y.	1-2313	4,000
Ice Tech '81	To share in the financial support to conduct the "Ice Tech '81 Conference."	Society of Naval Architects and Marine Engineers New York, N.Y.	1-2251	5,000
Proof of Concept Trials	To conduct tests and evaluation of instrumentation to determine the proper procedures and level of precision for deriving hydrodynamic coefficients and math model of ship performance.	Maritime Engineering Service Great Neck, N.Y.	MA5-0135	40,257
Maritime Simulation Conference '81 (MARSIM 81)	To provide support and conduct a conference to bring together those engaged in vessel command and control simulation for training merchant vessel officers.	Webb Institute of Naval Architecture Glen Cove, N.Y.	MA5-0138	25,958
Great Lakes Hull Stress-Warning System	To develop detailed plans and provide arrangements for a prototype stress-warning system for an appropriate Great Lakes vessel.	Hoffman Maritime Consultants Glen Head, N.Y.	9-00048	56,041
Computational Prediction of Ship Motion in Confined Waters	To develop a finite difference technique program for handling all ship motion problems in still waters and waves in restricted waters.	Austin Research Associates Austin, Tex.	9-00089	38,897
Instrumentation for the Estimation of Full Scale Hydrodynamic Coefficients	To install an instrumentation package capable of obtaining full-scale seakeeping and maneuvering data for full-scale trials for the development of a maneuvering mathematical model.	Systems Control, Inc. Palo Alto, Calif.	0-01092	109,971

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Second Hull Stress Monitoring & Guidance System on a Great Lakes Carrier	To design, build, install and evaluate a hull stress monitoring system on a Great Lakes ore carrier to warn personnel of high stress levels and for use to evaluate alternative corrective action.	Hoffman Maritime Associates Glen Head, N.Y.	1-10055	\$ 68,058
Reduce Hull Vibration	To analyze the effect of cavitation on hull pressures to develop a prediction technique for hull-vibration analysis.	Massachusetts Institute of Technology Cambridge, Mass.	9-00032	144,000
Development and Application of Techniques for Assessing and Optimizing for Reducing Wave Production Power of Ships	To employ and develop the proven XY method to carry out wave surveys with an optimization scheme on a model of a MARAD hull design.	Webb Inst. of Naval Architecture Glen Cove, N.Y.	1-10066	18,745
Coal Slurry Tanker Movements of Western Coal to East Coast Utilities	To examine the cost of moving coal to West Coast ports for shipment by U.S.-flag vessels to East Coast destinations as compared to consumption of Eastern coals on an as-burned basis.	University of Arizona Tucson, Ariz.	1-10026	51,750
Adoptive Control System to Minimize Propulsion Losses Due to Steering	To develop an adoptive control system for outline minimization of steering-related propulsion losses.	University of Illinois Champaign, Ill.	1-10058	22,376
Maximum Strength of Ship Hulls	To develop an analytical method for determining the maximum strength of longitudinally stiffened ship hulls subjected to a combination of bending, shear, torsion and normal water pressure.	Lehigh Univ. Bethlehem, Pa.	1-10059	49,000
Port Facilities to Support Incinerator Ships	To examine the potential obstacles in developing waterfront facilities financed by local and state governments in order to find alternative methods of encouraging and assisting governmental bodies in developing port facilities to support incinerator ships.	Massachusetts Institute of Technology Cambridge, Mass.	1-10060	50,000
Biofouling Control Through Electrochemical Modification of Interfaces	To demonstrate the effect of altered interfacial properties on control of biofouling the marine environment.	University of Miami Miami, Fla.	1-10061	49,981

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Development of Diesel Propulsion Engine Transient Relationships	To conduct research and tests based on current equations developed by the Univ. of Michigan to test and conduct simulation and into confirmation by running of test-cell engines controlled by special transient load-control equipment now available at the contractor's site.	University of Michigan Ann Arbor, Mich.	1-10062	\$ 43,064
Resistant Reduction in Merchant Ships by the New Propulsion System	To examine and conduct model tests in the use of suction for the prevention of boundary layer separation at the stern of a ship employing a "New Propulsion System" which is being adopted for installation in surface ships.	University of Rhode Island Providence, R.I.	1-10063	34,769
Accuracy Control in Zone Outfitting in U.S. Shipyards	To develop system techniques for monitoring of accuracy in joining modules in the shipbuilding technique known as zone outfitting.	University of Washington Seattle, Wash.	1-10064	42,500
Performance Characteristics of a Fluidized Bed Operated as an Unfired Heat Exchanger and the Influence of Simulated Ship Motions	To obtain and analyze the performance characteristics of the fluidized bed as an unfired heat exchanger and to observe its behavior under conditions of simulated ship motions.	Webb Inst. of Naval Architecture Glen Cove, N.Y.	1-10065	43,200
Planning & Operation of Waterborne Passenger Terminal Systems for Urban Areas	To test and evaluate a simulation of passenger terminals in urban areas.	Polytechnic Institute of New York New York, N.Y.	9-00107	8,100
Radio Frequency Management	MARAD's share to participate in the overall government frequency management coordination program.	National Oceanic & Atmospheric Administration Rockville, Md.	400-19000	8,796
Radio Technical Commission	MARAD's share to support work of the R.T.C.M. in the area of marine navigation and telecommunications.	U.S. Coast Guard c/o Federal Communications Commission Washington, D.C.	400-19003	17,400
Institute of Tele-Communications Sciences/ Engineering Developmental Tasks	To provide support to the I.T.S. for representatives, studies, and analyses relating to spread spectrum.	Institute of Telecommunications Science Boulder, Colo.	400-19004	40,000

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Modular Industrial Plant Systems	To identify plant systems which can be constructed in U.S. shipyards and readily transported by vessel to remote sites.	Simat, Helliesen and Eichner, Inc. Washington, D.C.	1-10035	\$ 92,485
Emergency Signal Calling	To provide U.S. manufactured equipment and personnel to participate in the international trial program for LDT/EPIRB's sponsored by the International Radio Consultative Committee (CCIR).	Mitre Corp. Metrek Div. McLean, Va.	8-3108	292,708
National Maritime Research Center				
CAORF:				
Management and Operations*	To provide staff and technical expertise in the management of the simulation operations to the Computer-Aided Operations Research Facility for the period January 1, 1981 through September 30, 1981.	Grumman Data Systems Bethpage, N.Y.	1-10041	1,541,000
Technical Research Experimenter*	To provide for the analysis of maritime problems related to marine facility design, ship operations, navigation, maneuvering and for developing scenarios and experiments at the Computer-Aided Operations Research Facility for the period January 1, 1981 through March 30, 1982.	Ship Analytics Centerport, N.Y.	1-10042	810,000
Maintenance & Engineering Support*	To provide the daily engineering maintenance for the technical hardware support services necessary to maintain the Computer-Aided Operations Research Facility for the period January 1, 1981 through September 30, 1981.	Sperry Systems Management Great Neck, N.Y.	1-10033	1,400,000
Santa Barbara Risk Management	To provide technical research support for Risk Management Analysis of the Santa Barbara Channel.	John J. McMullen Associates New York, N.Y.	MA5-0110	19,909

* Cost Shared

Appendix III: RESEARCH AND DEVELOPMENT CONTRACTS AWARDED—FISCAL YEAR 1981

Projects	Task	Vendor	Contract Number	Amount
Agency Support				
Market Analysis:				
Maritime Industry Liner Strategic Planning	To foster market planning in the U.S. maritime industry by developing a strategic planning conceptual framework and to prepare and demonstrate a long range market plan.	Delta Steamship Lines, Inc. New Orleans, La.	1-10040	\$148,682
U.S./U.S.S.R. Bilateral Trade Agreement*	To receive, identify, process store and report to the designated representatives of the two nations by a suitable electronic data processing system information on U.S./U.S.S.R. cargo movements by vessels in liner service as required by the Agreement dated December 29, 1975 between the U.S. and U.S.S.R.	GRC Data Corp. New York, N.Y.	4-37066	47,286
Implementation of the UNCTAD Liner Code	To develop and evaluate options available to the U.S. in response to the implementation of the Liner Code.	TRG Washington Group Washington, D.C.	0-01076	36,360
Port and Intermodal:				
Maryland Port System Study	To document and identify transportation policies and goals over a 20 year period for the State of Maryland.	MD State DOT Baltimore, Md.	SAH-11008	75,000
Vessel In-Port Locator*	To develop a management information system which enables the National Association of Marine Exchanges to provide nationally integrated data on vessel movements between U.S. ports.	Marine Exchange of the San Francisco Bay Region San Francisco, Calif.	SAH-11005	94,000
Marine Terminal Automated Management Control System*	To conduct a pilot demonstration of a computer generated, automated management system in a public marine terminal.	ARINC Research Annapolis, Md.	0-01004	94,446

* Cost Shared

Appendix III: Continued

Projects	Task	Vendor	Contract Number	Amount
Tanker Berthing Evaluation*	To develop a validation simulation capability for the Computer-Aided Operations Research Facility to compare alternatives of various types of tugboats and procedures for berthing vessels.	Hydronautics Laurel, Md.	9-00087	\$130,000
Appropriate Tariff Rates for Ports	To develop a formula for ratemaking for individual port authorities and conferences to enable the development of compensatory tariff rates on marine services.	Applied Systems Inst., Inc. Washington, D.C.	0-01009	145,556
Coal Terminal Design Criteria	To demonstrate the economics and business opportunities in building both shallow draft and wide beam bulk carriers and coal terminal facilities to accommodate their loading and discharge.	John J. McMullen New York, N.Y.	1-10037	24,000
Economic Impact of Port Marine Terminal/Stevedore Industry	To develop a regional input/output model and methodology to measure the regional impact of port activities to produce economic profiles of the stevedore/terminal operators to measure jobs, income, taxes and affected industries.	The Port Authority of New York/New Jersey	9-00094	5,000
Delaware River Regional Port Study	To assess rail freight terminals and interchange facilities linking the various ports of the Delaware River Valley.	Delaware River Port Authority of Pennsylvania and New Jersey Camden, N.J.	0-01044	77,000
Inter-American Committee On Ports	MARAD's support of the Twelfth Inter-American Committee on Ports meeting.	City of Miami Miami, Fla.	0-02414	6,000

* Cost Shared

Appendix IV: STUDIES AND REPORTS RELEASED IN FY 1981

The following major* studies or reports were released by the Maritime Administration during fiscal year 1981.

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

MARAD 1980 (The Annual Report of the Maritime Administration for Fiscal Year 1980), 81pp, \$5.25, [GPO]

Index of Current Regulations of the Maritime Administration, Maritime Subsidy Board and National Shipping Authority (revised as of January 1, 1981) 43pp [MarAd]

Maritime Subsidies 1980, 188pp, [MarAd]

U.S. Exports and Imports Transshipped Via Canadian Ports, March 1981, 60pp [MarAd]

Economic Impact of Maritime Industries on the U.S. Economy—An Interindustry Analysis, prepared by University of Bridgeport, January 1981, 280pp, PB-81-184277 [NTIS] \$28.50

Financial Management Technique for U.S. Liner Companies—Proceedings Report, prepared by P. F. Richardson Associates, Inc. March 1981, PB-81-199119 [NTIS] \$7.50

Opportunities for U.S.-Flag Product and Chemical Tankers, prepared by International Maritime Associates with assistance from Chem Systems, Inc., Hydronautics, Inc., and Avondale Shipyards, Inc. 1980 [NTIS]

Volume 1	Executive Summary	13pp
PB-81-152944		\$6.00

Volume 2	Final Report and	255pp
PB-81-152951	Executive Summary	\$21.00

Volume 3	Appendix A-Commodity Demand and Projected Waterborne Shipments	200pp
PB-81-152969		\$15.00

Volume 4	Appendix B-Ship Demand Projects and Fleet Profiles	40pp
PB-81-152977		\$7.50

Volume 5	Appendix C-Conceptual Designs and Technology	178pp
PB-81-152985		\$15.00

Volume 6	Appendix D-Ownership	127pp
PB-81-152993		\$13.50

Set		Contact NTIS
PB-81-152936		

Wind Propulsion for Ships of the American Merchant Marine, prepared by Wind Ship Development Corp., March 1981, 278pp, \$22.50, PB-81-162455, [NTIS]

* Current reports and studies of the Maritime Administration are listed in *MarAd Publications*, which is available upon request from headquarters and field offices of this Agency.

Acknowledgments

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

Agri-Trans Corp.

American President Lines, Ltd.

American Waterways Operators,
Inc.

Atlantic Richfield Co.

Dravo Mechling Corp.

Jeffboat, Inc.

Lykes Bros. Steamship Co., Inc.

M/G Transport

National Steel and Shipbuilding Co.

Overseas Shipbuilding Group, Inc.

Port of Galveston

Sea-Land Industries, Inc.