ANALYSIS OF THE INTERNATIONAL COMPETITIVENESS OF THE U.S. COMMERCIAL SHIPBUILDING AND REPAIR INDUSTRIES

Report to the Committee on Ways and Means, U.S. House of Representatives, on Investigation No. 332-197 Under Section 332(g) of the Tariff Act of 1930

USITC PUBLICATION 1676

APRIL 1985

United States International Trade Commission / Washington, D.C. 20436

UNITED STATES INTERNATIONAL TRADE COMMISSION

COMMISSIONERS

Paula Stern, Chairwoman
Susan W. Liebeler, Vice Chairman
Alfred E. Eckes
Seeley G. Lodwick
David B. Rohr

This report was prepared principally by

Deborah Ladomirak, Diane Manifold, and John Cutchin
Machinery and Equipment Division

Constance Hamilton, Kim Skidmore, Roy Ginsberg, and Paul Golding
Office of Economics

Office of Industries
Vern Simpson, Acting Director

Address all communications to
Kenneth R. Mason, Secretary to the Commission
United States International Trade Commission
Washington, DC 20436

Preface

On October 4, 1984, at the request of the House Committee on Ways and Means (app. A.) and in accordance with section 332(b) of the Tariff Act of 1930 (19 U.S.C.) 1332(b)), the United States International Trade Commission instituted investigation No. 332-197 for the purpose of analyzing the international competitiveness of the U.S. commercial shipbuilding and repair industries of the United States. The study assesses the factors affecting the present international competitive position of U.S. commercial shipbuilders and repairers, compares structural characteristics of the U.S. industry and foreign industries, examines the extent of government involvement in the industry, and identifies the steps that have been and may be taken to counteract disadvantageous competitive developments. The report also analyzes Draft Substitute Amendment H.R. 3399, the Maritime Redevelopment Bank Bill, and its potential impact on the U.S. shipbuilding and ship-repair industries and their international competitiveness.

Notice of this investigation was given by posting copies of the notice of investigation at the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the Federal Register (49 F.R. 39924, Oct. 11, 1984) (app. B).

In the course of this investigation, the Commission collected data and information from questionnaires sent to U.S. shipbuilders and ship-repair firms. In addition, information was gathered from various public and private sources, from questionnaire responses prepared by overseas posts of the U.S. Department of State, from interviews with foreign embassies, from interviews with industry executives representing shipbuilders, repairers, shipowners and operators, and component producers, as well as from public data gathered in other Commission studies.

C O N T E N T S

	Page
Preface	i
Executive Summary	vii
Description and uses	1
U.S. industry profile:	
U.S. producers	5
Purchasing process	11
Construction and repair activity	11
U.S. capacity and capacity utilization	15
Employment and wages	17
Hours worked	21
Wages	21
Financial experience of the U.S. industry	23
Research and development	24
Capital expenditures	26
Foreign trade	27
Commercial shipbuilding and repairing supplier industry	27
U.S. Government involvement	30
Ownership of facilities	30
Research and development	31
Tax policies	34
Subsidies	35
Financing	38
Export promotion	38
Other policies and assistance	39
World industry and world market	43
Far East	44
European Community	44
Other West European countries	45
Eastern Europe	45
Competitive position of the U.S. commercial shipbuilding and ship repairing industries in the world market	45
Price	46
Raw and semifinished materials	46
Capital	46
Labor	48
Quality and technology	49
Delivery time	51
Government involvement	52
U.S. shipyard's responses to foreign competition	52
Ocean freight shipping	53
U.S. trade	54
Recent initiatives on behalf of the U.S. shipbuilding and ship repairing industries	55
Office of Technology Assessment	56
National Advisory Committee on Oceans and Atmosphere	56
Maritime Redevelopment Bank Charter Act of 1985	57
U.S. industry's perspective	60
Ship operators' perspective	61
Labors' perspective	61
Selected U.S. Government agencies' perspectives	61

CONTENTS

Page

Recent initiatives on behalf of the U.S. shipbuilding and ship-repairing industries--Continued
Cargo preference---------- 62
U.S. shipbuilding industry's perspective---------- 62
Labor's perspective---------- 63
Selected U.S. Government agencies' perspectives---------- 63
Likely impact of the proposed initiatives on the U.S. industries------ 64
Appendix A. Letter of request from Chairman, Subcommittee on Trade, Committee on Ways and Means, U.S. House of Representatives---------- 65
Appendix B. Notice of Institution of Investigation No. 332-197---------- 69
Appendix C. Selected Country Profiles---------- 73
Appendix D. H.R. 33, Maritime Redevelopment Bank Charter Act of 1985----- 181

Figures

1. Index of estimated shipbuilding costs in the United States---------- 6
2. Division of labor in U.S. shipyards, by major trades, 1983---------- 19
3. Department of Defense Manufacturing Technology Program---------- 33
C-1. Major Korean shipbuilders and ship repairers---------- 98
C-2. Major French shipbuilders and ship repairers---------- 130
C-3. Major Canadian shipbuilders and ship repairers---------- 175

Tables

1. Commercial ships: Major U.S. shipyards and their locations, 1984---- 8
2. Commercial ships: Major U.S. ship repair facilities and their locations, 1984---------- 9
3. Commercial ships: U.S. shipyard closings, and their locations, 1979-84---------- 10
4. Commercial ships: U.S. producers' construction and repair work, 1979-84---------- 11
5. Commercial ships: Deliveries of new U.S.-built ships, by types, 1979-84---------- 12
6. Military ships: U.S. producers' construction and repair work, 1979-84---------- 14
7. Commercial ships: U.S. shipbuilders' and repairers' employment, capacity, and capacity utilization, 1979-84---------- 15
8. Commercial ships: U.S. shipbuilders' production, capacity, and capacity utilization, 1979-84---------- 16
9. Commercial ships: Shipbuilding ways of major U.S. private commercial shipyards, by regions and by maximum ship sizes, 1984---------- 16
10. Average number of employees and production and related workers in U.S. establishments producing commercial ships and providing commercial shipbuilding and repair services, 1979-84---------- 18
11. Hourly wages paid to production and related workers in all manufacturing, construction and shipbuilding and repair, 1979-84------- 22
12. Commercial ships: U.S. shipyards' net sales and operating profit on their overall operations and on commercial operations, 1979-84-- 23
13. Commercial ships: U.S. shipbuilders' and repairers' capital expenditures for domestic facilities, by major types, 1979-84------ 26

CONTENTS

		Page
14.	Commercial ship components: Number of major U.S., European, and Japanese manufacturers, by types, 1983	29
15.	Components of commercial ships: Purchases of selected foreign-built components and services by U.S. shipbuilders and repairers, by types, 1979-84	29
16.	U.S. private shipyards performing naval construction and/or repair work, by types of work performed, 1979-84	32
17.	Maritime construction differential subsidy and reconstruction subsidy expenditures, by types, fiscal years 1936-83	36
18.	Eximbank support for U.S. exports of the commercial shipbuilding industry, by types of program, 1979-84	38
19.	Share of new orders for commercial ships exceeding 100 gross tons, by selected regions, 1979-83	44
20.	Commercial shipbuilding and ship repairing: U.S. producers' competitive assessment of structural factors of competition for selected foreign industries, 1979-84	47
21.	Short-term money market rates for the United States and other specified markets, 1979-83	48
22.	Major world merchant fleets, by countries, Jan. 1, 1983	53
23.	U.S. oceanborne trade, by flag carrier, 1979-83	54
24.	U.S. oceanborne foreign trade, by leading flags of foreign registry, 1979 and 1983	55
C-1.	Percentage distribution of market shares in the Japanese ship-building industry, by firms, 1983	76
C-2.	Major Japanese ship-repairing firms and their market shares, 1983	76
C-3.	Disposal of Japanese surplus shipbuilding facilities, November 1978-May 1984	77
C-4.	Employment and earnings in Japan's shipbuilding and repair industries, 1979-83	79
C-5.	Net sales and net income in Japan's shipbuilding and repair industries, 1979-82	81
C-6.	Production under the Japanese Government shipbuilding program, 1981-83	83
C-7.	Loans for Japanese ship operators, 1951-83	86
C-8.	Employment of all workers in Korea's shipbuilding and ship-repair industries, 1979-83	99
C-9.	New construction in Korea's shipbuilding industry, by firms, 1979-83	100
C-10.	New orders, domestic and foreign, in Korea's shipbuilding industry, 1979-83	101
C-11.	Commercial ships: Korean exports, by types, 1979-83	101
C-12.	Korean National Investment Fund bans for shipbuilding, fiscal years 1975/76 to 1983/84	105
C-13.	Employment and average monthly wages of production and total employees in Taiwan's shipbuilding and ship-repair industries, 1979-83 and January-June 1984	111
C-14.	Research and development expenditures of the 2 major shipbuilders in Taiwan's shipbuilding and ship-repair industries, 1979-84	113
C-15.	Sales and net income (or loss) of the 2 leading shipbuilding firms in Taiwan's shipbuilding and ship-repair industries, July 1979-June 1985	113

CONTENTS

		Page
C-16.	Commercial ships: Taiwan production and market share of production by State-owned and private firms, 1979-83 and January-June 1984	114
C-17.	Commercial ships: Taiwan production, by types, 1979-83, and January-June 1984	114
C-18.	Commercial ships: Total value in Taiwan of ship-repair work and market share of repair work by State-owned and private firms, 1979-83, and January-June 1984	115
C-19.	Commercial ships: Australian production, by types, fiscal years 1980/81 to 1984/85	122
C-20.	Share distribution of production in Denmark's shipbuilding and ship-repair industries, by firms, 1979-83	124
C-21.	Employment in Denmark's shipbuilding and ship repair industries, 1979-83	125
C-22.	Commercial ships: Danish production, by types, 1979-83	127
C-23.	Commercial ships: French production, by types, 1983	131
C-24.	Commercial ships: West German production, by types, 1983	135
C-25.	Commercial ships: United Kingdom orders, by types, as of Oct. 31, 1984	143
C-26.	European Regional Development Fund assistance to the shipbuilding and ship-repair industries of the European Community, by countries, 1975-82	149
C-27.	Employment and wages in Finland's shipbuilding and ship-repair industries, 1979-84	152
C-28.	Commercial ships: Finland's deliveries, 1979-84	152
C-29.	Commercial ships: Production orders in Finland, by shipyards, as of Sept. 30, 1984	153
C-30.	Commercial ships: Swedish production, 1979-83	155
C-31.	Commercial ships: Swedish production, by types, 1983	156
C-32.	Major firms in Spain's shipbuilding and repair industries, by types of ownership and by locations, 1984	160
C-33.	Commercial ships: Spanish production, 1979-83	162
C-34.	Major firms in Poland's shipbuilding and ship-repairing industries, by locations, 1984	164
C-35.	Commercial ships: Polish production and repair activities, 1979-83	165
C-36.	Major ship yards in Brazil's shipbuilding and ship-repair industries, by locations, 1984	169
C-37.	Major shipyards in Canada's shipbuilding and repair industries and their locations, 1984	174
C-38.	Employment in Canada's shipbuilding and repair industries, 1979-83	176
C-39.	Construction and repair of Canada's commercial and Government vessels, 1979-83	177
C-40.	Canadian Government subsidy payments to shipyards, 1979-83	179

CONTENTS

		Page
14.	Commercial ship components: Number of major U.S., European, and Japanese manufacturers, by types, 1983	29
15.	Components of commercial ships: Purchases of selected foreign-built components and services by U.S. shipbuilders and repairers, by types, 1979-84	29
16.	U.S. private shipyards performing naval construction and/or repair work, by types of work performed, 1979-84	32
17.	Maritime construction differential subsidy and reconstruction subsidy expenditures, by types, fiscal years 1936-83	36
18.	Eximbank support for U.S. exports of the commercial shipbuilding industry, by types of program, 1979-84	38
19.	Share of new orders for commercial ships exceeding 100 gross tons, by selected regions, 1979-83	44
20.	Commercial shipbuilding and ship repairing: U.S. producers' competitive assessment of structural factors of competition for selected foreign industries, 1979-84	47
21.	Short-term money market rates for the United States and other specified markets, 1979-83	48
22.	Major world merchant fleets, by countries, Jan. 1, 1983	53
23.	U.S. oceanborne trade, by flag carrier, 1979-83	54
24.	U.S. oceanborne foreign trade, by leading flags of foreign registry, 1979 and 1983	55
C-1.	Percentage distribution of market shares in the Japanese shipbuilding industry, by firms, 1983	76
C-2.	Major Japanese ship-repairing firms and their market shares, 1983	76
C-3.	Disposal of Japanese surplus shipbuilding facilities, November 1978-May 1984	77
C-4.	Employment and earnings in Japan's shipbuilding and repair industries, 1979-83	79
C-5.	Net sales and net income in Japan's shipbuilding and repair industries, 1979-82	81
C-6.	Production under the Japanese Government shipbuilding program, 1981-83	83
C-7.	Loans for Japanese ship operators, 1951-83	86
C-8.	Employment of all workers in Korea's shipbuilding and ship-repair industries, 1979-83	99
C-9.	New construction in Korea's shipbuilding industry, by firms, 1979-83	100
C-10.	New orders, domestic and foreign, in Korea's shipbuilding industry, 1979-83	101
C-11.	Commercial ships: Korean exports, by types, 1979-83	101
C-12.	Korean National Investment Fund bans for shipbuilding, fiscal years 1975/76 to 1983/84	105
C-13.	Employment and average monthly wages of production and total employees in Taiwan's shipbuilding and ship-repair industries, 1979-83 and January-June 1984	111
C-14.	Research and development expenditures of the 2 major shipbuilders in Taiwan's shipbuilding and ship-repair industries, 1979-84	113
C-15.	Sales and net income (or loss) of the 2 leading shipbuilding firms in Taiwan's shipbuilding and ship-repair industries, July 1979-June 1985	113

CONTENTS

		Page
C-16.	Commercial ships: Taiwan production and market share of production by State-owned and private firms, 1979-83 and January-June 1984	114
C-17.	Commercial ships: Taiwan production, by types, 1979-83, and January-June 1984	114
C-18.	Commercial ships: Total value in Taiwan of ship-repair work and market share of repair work by State-owned and private firms, 1979-83, and January-June 1984	115
C-19.	Commercial ships: Australian production, by types, fiscal years 1980/81 to 1984/85	122
C-20.	Share distribution of production in Denmark's shipbuilding and ship-repair industries, by firms, 1979-83	124
C-21.	Employment in Denmark's shipbuilding and ship repair industries, 1979-83	125
C-22.	Commercial ships: Danish production, by types, 1979-83	127
C-23.	Commercial ships: French production, by types, 1983	131
C-24.	Commercial ships: West German production, by types, 1983	135
C-25.	Commercial ships: United Kingdom orders, by types, as of Oct. 31, 1984	143
C-26.	European Regional Development Fund assistance to the shipbuilding and ship-repair industries of the European Community, by countries, 1975-82	149
C-27.	Employment and wages in Finland's shipbuilding and ship-repair industries, 1979-84	152
C-28.	Commercial ships: Finland's deliveries, 1979-84	152
C-29.	Commercial ships: Production orders in Finland, by shipyards, as of Sept. 30, 1984	153
C-30.	Commercial ships: Swedish production, 1979-83	155
C-31.	Commercial ships: Swedish production, by types, 1983	156
C-32.	Major firms in Spain's shipbuilding and repair industries, by types of ownership and by locations, 1984	160
C-33.	Commercial ships: Spanish production, 1979-83	162
C-34.	Major firms in Poland's shipbuilding and ship-repairing industries, by locations, 1984	164
C-35.	Commercial ships: Polish production and repair activities, 1979-83	165
C-36.	Major ship yards in Brazil's shipbuilding and ship-repair industries, by locations, 1984	169
C-37.	Major shipyards in Canada's shipbuilding and repair industries and their locations, 1984	174
C-38.	Employment in Canada's shipbuilding and repair industries, 1979-83	176
C-39.	Construction and repair of Canada's commercial and Government vessels, 1979-83	177
C-40.	Canadian Government subsidy payments to shipyards, 1979-83	179

Executive Summary

The U.S. commercial shipbuilding and repair industries are concerned about the decline in their competitive position in domestic and foreign markets in recent years. During 1979-84, the value of domestic shipbuilding and repair work decreased, as did new orders, capacity utilization, and employment. The declines were generally attributed, by industry sources, to strong competition from foreign shipyards and to the elimination of the Construction Differential Subsidy by the U.S. Department of Transportation.

The major findings of the study are summarized below:

1. STRUCTURE OF THE DOMESTIC AND FOREIGN INDUSTRY

- o The United States has the largest shipbuilding and repair industrial base in the Western World.

In terms of available facilities, the United States has the largest shipbuilding and repair industrial base in the Western World. In 1982, there were 581 firms operating an estimated 687 establishments producing and repairing commercial and military ships. Approximately 275 establishments were engaged in commercial shipbuilding and repairing. However, only 10 percent of these yards, approximately 27 in number, were classified by the U.S. Maritime Administration as major shipbuilding and repair centers in 1979. By 1984 there were only 24 major shipyards in the United States, 18 of which were available for commercial shipbuilding. The majority of these are located on the east and gulf coasts of the United States. There are also numerous firms, located throughout the United States, that manufacture components used to construct or repair oceangoing vessels.

- o In recent years, production and repair of commercial ships have shifted from developed countries in Europe to developed and developing countries in Asia.

Industry sources indicate that Asian shipyards received over 75 percent of new shipbuilding and repair orders in 1984, compared with approximately 55 percent in 1979. Important shipbuilding nations of the Far East include Japan, Korea and Taiwan. Singapore has gained prominence recently as an important ship-repair center. Building and repair activity in many European countries has declined because of the fact that the United Kingdom, Spain, France, and West Germany are not able to compete in the world market with the low prices offered by Asian shipyards.

- o U.S.-built commercial ships take twice as long to build and cost two times as much money as many comparable foreign-built vessels.

Because the U.S. shipbuilding industry lags behind many of their major foreign competitors in Japan and Korea in the use of modular construction techniques, in tooling, in the degree of automation, and in the methods of processing, joining, and assembling materials, their commercial ships cost more and take much longer to construct.

- o U.S. construction and repair of commercial ships has decreased greatly from the levels reached in 1979 and 1980. Consequently, construction and repair of military ships and vessels used in U.S. domestic commerce constitute the majority of the work currently being performed by the U.S. industry.

The value of both U.S. commercial shipbuilding and repair work rose from $2.9 billion in 1979 to $3.2 billion in 1980 before declining annually to an estimated $1.5 billion in 1984. The decline is attributed to strong competition from foreign shipbuilders and, more recenty, to the elimination of funding for the U.S. Construction Differential Subsidies Program. The majority of the commercial activities of the industry involves production and repair of vessels for domestic commerce as opposed to oceangoing vessels. Construction and repair of military ships, however, totaled $5.8 billion in 1984, an increase of over 65 percent from the level reached in 1979.

- o In 1984 only 9 percent of the U.S. shipbuilding and repair industries' net sales were derived from commercial shipbuilding and repairing.

Estimated net sales on their overall operations, as reported by questionnaire respondents, totaled $4.9 billion in 1984, compared with $3.4 billion in 1979. However, net sales (estimated) on commercial operations fell from $1.1 billion in 1979 to $435 million in 1984. The remainder of the industries' sales were realized from military work.

- o Employment in the U.S. shipbuilding and repair industries increased during 1979-84, but employment in the commercial ship sector declined significantly.

During 1979-84, the average number of persons employed in the production and repair of all ships rose from 84,473 to 89,880. However, the estimated number of workers engaged in the construction and repair of commercial vessels over 1,000 gross registered tons declined 76 percent during the same period, from 33,600 persons to 7,926 persons.

- o Despite the decline in economic activity, U.S. shipyards have retained a relatively high level of capital expenditures.

During 1979-84, the U.S. commercial shipbuilding and repair industries expended over $637 million for capital improvements at their domestic facilities. The majority of these expenditures were for building or leasehold improvements and new equipment. Prior to 1980, these improvements focused on increasing capacity and upgrading facilities. Since then, the industry has made important advances in welding, automated pipe fabrication, and the use of CAD/CAM equipment.

- o The U.S. shipbuilding industry exports little or none of its production as opposed to many foreign competitors.

The United States has not built any merchant vessels for non-U.S. purchasers in over 20 years, according to industry officials. This is due to

the fact that these ships can be purchased from foreign builders at much lower prices. Japan's shipbuilding industry depended on export orders for approximately 70 percent of its total ship construction activity during 1979-84. Korea's industry exported over 90 percent of its production in the same period.

- o The supplier base of the U.S. maritime industries has also declined as a result of the lack of commercial shipbuilding activity in the United States.

Many suppliers of subcomponents for commercial vessels have left the industry or have devoted the majority of their work to supporting military shipbuilding and repair or other, more stable nonmarine industries. The number of European and Japanese suppliers of major components exceeds the number of U.S. suppliers. Because of the declining U.S. supplier base, the purchase of certain foreign-built components has been necessary. During 1979-84, the cost of major components bought from foreign sources by the U.S. shipbuilding and repair industries totaled $50.5 million.

2. OCEAN FREIGHT SHIPPING

- o The United States has one of the largest merchant fleets in the world.

In terms of total cargo capacity, the U.S. merchant fleet is one of the world's largest, with 573 privately owned vessels capable of transporting 21.6 million deadweight tons. The U.S. Government owned an additional 259 ships with a cargo capacity of 2.8 million deadweight tons. However, a major portion of the privately owned fleet is registered abroad, many under the flags of Panama, Liberia, and Honduras.

- o While total U.S. oceangoing foreign trade, in tonnage, has decreased during 1979-83, the percentage of this trade carried by U.S. flag ships has increased.

Total U.S. oceanborne foreign trade decreased from 823 million tons, valued at $242 billion in 1979 to 630 million tons, valued at $267 billion in 1983. The percentage of this trade carried by U.S. flag ships remained at less than 10 percent in tonnage and less than 20 percent in value during this period. In tonnage, U.S. flag ships transported 4.3 percent of oceanborne foreign trade in 1979, compared with 5.8 percent in 1983. In terms of value, this share increased from 14.7 percent in 1979 to 16.1 percent in 1983.

- o The major foreign flag carriers that transport U.S. oceanborne foreign trade are Liberia, Panama, and Greece.

Oceangoing vessels registered under the Liberian flag carried 28.1 percent of U.S. oceanborne foreign trade in 1983, compared with 31.7 percent in 1979. Panama's merchant fleet transported 10.8 percent in 1983 and Greece's, 10.3 percent in the same year. This compares with 7.5 percent for Panama and 13.3 percent for Greece in 1979.

3. CONDITIONS OF COMPETITION

o The price of U.S.-produced commercial ships and ship repairs is significantly higher than the world price.

Commercial ships cost between 2 and 3 times more to build in the United States than in many foreign shipyards. Foreign shipyards also have a competitive price advantage in commercial ship repair. These higher U.S. prices are due primarily to higher material and labor costs and longer construction times in the United States.

o Foreign shipbuilders and ship repairers enjoy a competitive advantage in the cost of raw and semifinished materials, the availability and cost of capital, and the cost of labor.

Respondents to the Commission's questionnaire indicate that foreign shipyards are able to obtain the principal semifinished materials consumed in the construction and repair of commercial ships at lower prices than can U.S. shipyards. This is due to the fact that many of these firms benefit from reduced costs because of their vertical integration. The U.S. industry's disadvantages in the areas of cost of materials and labor are attributed to the fact that these costs are simply higher in the United States than in many of the foreign shipbuilding centers. In Korea and Japan, these costs are estimated to be one-third to one-half of comparable U.S. costs. Many of the foreign shipyards are believed to be able to attract capital to their industry more effectively than can their U.S. counterparts because of the policies of their respective governments.

o U.S. and foreign shipbuilders and repairers were judged to be equally competitive in the areas of availability of raw and semifinished materials, availability and skill level of labor, product quality, and level of technology.

Questionnaire respondents stated that the U.S. industry was on a par with the majority of its major foreign competitors in its access to the material and labor components necessary for commercial shipbuilding and repair. The skill level of its labor force and the level of technology in the domestic industry were judged comparable with those of almost all of its foreign counterparts. Since the majority of merchant vessel types are similar in design and construction, product quality was seen as equal throughout the world market.

o The domestic industries received assistance from the U.S. Government through a variety of programs during 1979-84.

The U.S. Government has traditionally had programs that were designed specifically to assist the domestic maritime industries, in addition to those programs designed to be available to all U.S. industries. Such programs are sponsored by the U.S. Maritime Administration; the U.S. Departments of

Defense, Commerce, and Labor; and the Export-Import Bank. The programs include ownership of production and repair facilities, research and development assistance, preferential tax policies, direct and indirect subsidies, export promotion, and other miscellaneous programs.

- o The vast majority of the major foreign shipbuilders and repair firms receive assistance from their governments.

The degree of government assistance afforded to foreign shipbuilders and repairers varies greatly depending on the country, as discussed in appendix C. These industries have been targeted in many of the Far Eastern countries as a priority for economic development, and the government directs them through one or more types of activities such as merger policies, direct subsidies, preferential financing, tax benefits, research and development assistance, and export promotion. The European Community, in addition to the individual member states' involvement in their domestic industries, provides assistance in the form of such programs as mergers and industry restructuring aid, subsidies, and financing assistance. In Eastern Europe, the shipbuilding and repair facilities are often owned by the respective governments, which control all phases of their operations.

- o With certain exceptions, intervention by foreign governments in their domestic commercial shipbuilding and repair industries has achieved mixed results in improving their respective competitive positions.

Japan, Korea, Taiwan, Brazil and Singapore are major builders and/or repair centers today partly because their governments heavily promoted the industry through industrial policy and assistance to improve competitiveness. Moreover, industrial policies and government assistance in the leading shipbuilding nations have been modified to conform with changing demand and economic conditions. In contrast, the shipbuilding and repair centers of European Community members generally have not remained competitive in world markets in spite of significant infusions of government aid.

- o Foreign competitors enjoy a competitive advantage in the area of government assistance that directly benefit their maritime industries.

Questionnaire respondents stated that the domestic shipbuilding and repair industries are at a competitive disadvantage vis-a-vis their major foreign counterparts in the area of subsidies and research and development assistance. U.S. Government regulations such as environmental and worker health and safety regulations were also perceived by the U.S. industry to hinder their competitiveness.

4. U.S. GOVERNMENT INITIATIVES

- o U.S. Government and private industry analysts assert that the United States does not have a comprehensive maritime policy that deals effectively and equitably with the shipbuilding and shipping sectors, while adequately addressing, as well, the need for maintaining national defense capabilities.

Many of the current maritime policies of the United States link the shipbuilding and shipping industries and, therefore, impose increased costs on U.S. ship operators in order to promote and preserve commercial shipbuilding and repair for national defense reasons. However, recent studies indicate that wartime requirements may depend more on the sufficiency of U.S.-controlled shipping, rather than shipbuilding or ship-repair capacity.

- o Respondents to the Commission's questionnaire and data collected during the investigation indicate that while there is a need for Federal Government assistance if the U.S. industry is to be revitalized, the tax relief proposal, subsidies, and financing policies in the proposed Maritime Redevelopment Bank are unlikely to be sufficient to allow the industry to effectively compete in the world market.

Data collected during the investigation support the domestic industries' contention that even the most advantageous financing scheme proposed under this legislation could not alter the industry's fundamental competitive disadvantages of higher labor and higher material costs. However, the proposal for increased U.S. Government assistance in research and development could assist the industry in modernizing, if U.S. shipyards could be persuaded to fully take advantage of this program.

- o The domestic shipbuilding industry and organized labor favor cargo preference legislation to revitalize the U.S. maritime industry.

The U.S. industry feels that because currently proposed cargo preference legislation would stimulate a rebuilding of the U.S. flag bulk cargo fleet, it could reverse the decline of domestic shipbuilding activity. Officials of organized labor strongly support the idea of cargo preference; however, the U.S. General Accounting Office and U.S. Maritime Administration indicate this proposal may increase shipping costs and could have an adverse impact on U.S.-foreign relations and exports.

Description and Uses

Commercial ships are generally defined as powerdriven, oceangoing vessels whose gross weight equals or exceeds 1,000 gross registered tons (grt). 1/ These products are classified under Standard Industrial Classification (SIC) number 3731, "Ship Building and Repairing." Included in this definition are breakbulk ships, containerships, roll-on/roll-off ships, dry bulk cargo ships, tankers, liquified natural gas carriers, and passenger ships.

Breakbulk ships, also called general cargo ships, are multipurpose vessels that transport cargos of nonuniform sizes, often on pallets. The inboard space on these ships is usually divided longitudinally by transverse bulkheads into a series of cargo compartments of approximately equal volume. The cargo on a breakbulk ship is handled through large rectangular deck openings (hatches) over each cargo space. Mechanically operated hatch covers are used to close the openings. Breakbulk cargo handling between pier and ship is usually done by means of cargo booms installed at each hatch end on board. However, an increasing number of breakbulk cargo ships are being fitted with revolving deck cargo cranes, instead of masts, booms, and winches. 2/

Containerships are vessels designed to carry standard size cargo in preloaded containers. The use of standard containers facilitates shipboard stowage and land or waterway transportation. Containerships are typically equipped with specially designed holds to realize speedy container handling using shore-based equipment. Larger container vessels have the capacity to carry 2,000 to 2,200 containers. 3/

Roll-on/roll-off ships, commonly referred to as ro/ro's, were developed after World War II. These ships were designed to allow trucks or other vehicles to drive on and off for conveyance of cargo. However, according to industry sources, all ships that handle cargo by rolling it on wheels can be considered under this category. This includes trailer ships; sea trains (carrying railroad cars or entire trains); auto, truck, and trailer ferries; and military vehicle carriers. Roll-on/roll-off ships have a high proportion of cubic capacity relative to the amount of cargo they carry, and they are particularly well suited to making short runs with frequent loading and unloading. Usually ships of this type have a square-shaped stern, fitted with doors for handling vehicles. Roll-on/roll-off ships have several decks. The cargo is handled on wheels from the loading deck to other decks, using

---

1/ Gross registered tonnage is the measure of the cubic capacity of a Commercial ship's closed spaces; one ton represents 100 cubic feet. Deadweight tonnage (dwt) is the ship's total load-carrying capacity in tons, including cargo.

2/ "Ship, merchant," McGraw-Hill Encyclopedia of Science and Technology, Volume 12, 1977, pp. 303-304.

3/ Congress of the United States, Office of Technology Assessment, An Assessment of Marine Trade and Technology, October 1983, pp. 222-223; Congress of the United States, Congressional Budget Office, U.S. Shipping and Shipbuilding: Trends and Policy Choices, August 1984, p. 37; and "Ship, merchant," McGraw-Hill Encylopedia of Science and Technology, Volume 12, 1977, pp. 305-306.

elevators or sloping ramps. According to industry officials, this type of ship eliminates cranage and cargo handling, reduces pilferage, and permits a quick turn-around time in port. 1/

Dry bulk cargo ships, also called dry bulkers, are vessels that transport unpackaged, dry cargo, such as iron ore, coal, grain, cement, and sugar. Most oceangoing dry-bulk carriers are loaded and unloaded using shore-based installations. However, industry sources indicate that an increasing number of dry-bulk ships are being constructed with self-loading equipment.

Tanker is a generic term for any ship that transports liquid cargo. Tankers generally have two or three longitudinal bulkheads and numerous transverse bulkheads dividing the hull into tanks. Each tank has a watertight hatch and ventilator, and each tank is connected by pipeline to pumping rooms. The cargo is pumped through the pipelines into the ship's holds. According to industry officials, there are a number of varieties of tankers including crude tankers, which carry crude oil; product tankers, which transport refined petroleum products; and other tankers, which carry such diverse liquids as vegetable oils, chemicals, molasses, latex, wine, and fruit juices. 2/

Liquified natural gas (LNG) carriers are high-technology vessels, fitted with internally insulated tanks in their holds to transport liquified natural gas. The interiors of the holds are typically insulated with panels of balsa wood lined with plywood. The tanks are normally constructed of aluminum or nickel steel alloy. 3/

Passenger ships, as the name implies, are large, oceangoing vessels that typically transport people to areas that appeal to the tourist trade. Passenger ships are generally capable of carrying 1,200 to 2,000 passengers. These ships are constructed with accommodations that assure maximum comfort for passengers. These vessels must comply with International Safety of Life at Sea (SOLAS) regulations, which specify ship characteristics relating to hull damage, fire prevention, and other safety measures. 4/

Ships are designed and built to fulfill the requirements specified by the owner and/or operator. These requirements include the designated use of the vessel, the minimum deadweight carrying capacity, a specific tonnage limit, a specified speed at sea, maximum fuel consumption per shaft horsepower limitation, as well as other items which influence the basic ship design. 5/

The construction of an oceangoing ship is an involved, time consuming process, because each ship is basically custom built in conformance with the owner's requirements. According to industry sources, the time lapse from the first manhour to delivery of a vessel can vary from approximately 14-36 months, depending on the type of ship, and where it is constructed. 6/

1/ Ibid.
2/ Ibid.
3/ Ibid.
4/ Ibid.
5/ "Shipbuilding," McGraw-Hill Encylopedia of Science and Technology, Volume 12, 1977, p. 331.
6/ Congress of the United States, Office of Technology Assessment, An Assessment of Marine Trade and Technology, October 1983, p. 107.

Commercial repair of a vessel is basically defined as a one-time correction of a particular problem, often on an emergency basis. By comparison, overhauls are scheduled maintenance projects, usually every 4 to 6 years of a commercial ship's useful life, that require work taking six months to a year to complete. During an overhaul, a ship will normally be completely refurbished, as well as retrofitted, in order to bring its equipment up to the state of the art. 1/ Conversion or reconversion of a commercial vessel consists of converting or reconstructing a ship from one type to another.

Ship construction is basically a steel fabricating process. Modern shipbuilding is characterized by modular construction techniques, a high degree of preoutfitting, and integration of design and production. Industry observers assert that the U.S. shipbuilding industry lags behind many of its foreign competitors in the use of modular construction techniques, in tooling, in the degree of automation, in the use of robotics, and in the methods of processing, joining, and assembling materials. The U.S. industry also has older production facilities. The charge has been made that American-built ships take twice as long to build and cost twice as much money as comparable Asian-built vessels for these reasons. 2/ A study completed for the U.S. Maritime Administration in 1978 stated that U.S. shipyards employed lower levels of technology than many foreign yards, especially in management and systems-oriented systems. However, the study also found that the domestic industry excelled in the areas related to steel fabrication and product control. 3/ The Shipbuilders Council of America asserts that any technology lag between U.S. and foreign yards is a reflection of investment committments created by the marketplace.

In the past 3 to 5 years, however, numerous U.S. shipyards have adopted ship-engineering, control, and construction techniques used by foreign builders. In fact, several major shipbuilders and shiprepairers have reached agreements with Japanese firms for the transfer of technology related to construction, conversion, and repair operations. Important advances have also been made in welding techniques, modular construction methods, semiautomatic assembly of piping and structural members, and computer-based control methods. The most recent industry innovations include the use of computer-aided-design (CAD) and manufacturing (CAM) techniques and robotics.

Industry sources indicate that as shipyards adopt new methods of construction, such as zone outfitting 4/ and modular construction, a much closer integration of design and construction processes is required. CAD/CAM has been proposed as the solution to this requirement. 5/ CAD/CAM is still in its infancy with regard to its use in U.S. shipyards. The largest current

---

1/ Main Hurdman/KMG, Profile of the Shipbuilding and Repairing Industry, Oct. 1, 1984, p. 3.

2/ "CAD/CAM Key to U.S. Shipyard Revitalization," Marine Engineering/Log, October 1983, p. 61.

3/ Congress of the United States, Office of Technology Assessment, An Assessment of Marine Trade and Technology, October 1983, pp. 96-98.

4/ Zone outfitting refers to the construction and assembly of the major subassemblies of a ship on the ground rather than on or at the ship.

5/ "Computerizing the Shipyard," Marine Engineering/Log, March 1984, p. 70.

usage of this technology is in the design, drafting and engineering functions, although a modest amount of computer-based planning and production control applications are being incorporated into many shipyards. The U.S. Maritime Administration (MARAD) has been actively encouraging the domestic industry to utilize CAD/CAM technology. MARAD commissioned a research institute to survey U.S. shipyards regarding CAD/CAM in order to provide management with a comprehensive study of current and future computer-aided applications. Results of this study are not due to be released, however, until mid-1985. U.S. shipyards acknowledge that they have been slow in applying computerized automation in the construction and repair of commercial ships, but insist that they have made a commitment to incorporate its usage as soon as feasible. Industry sources believe that CAD/CAM has the potential to help the domestic industry overcome part of their productivity problem by shortening the time between vessel design and production. 1/

Robotics are also in the early stages of application in the U.S. shipbuilding industry, however, industry officials indicate that robots have a high potential for improving productivity and reducing fabrication costs. The most widespread current use of robots in shipbuilding is in the area of welding. Robotics, however, have definite limitations for reducing costs because of the small quantities of vessels constructed. 2/ According to available data, there are only 3 domestic shipyards that are currently employing robotics.

The most important developments in commercial shipbuilding, however, may not be in the area of advanced machinery, but in the standardization of parts, and in fundamental changes in organization of work, such as process lane technology 3/ and preoutfitting. 4/ These innovations are not limited to the largest shipyards, as many medium- and small-sized yards are adopting advanced processes. Process lane methodology consists of the categorization and separation of certain types of work so that the same employees at the same work stations can continually perform the same function with a constant, organized flow of material. This is expected to help increase worker productivity. 5/

Despite the above-mentioned advances in construction methods and machinery, it is still true that U.S. commercial shipyards require approximately 40 to 60 percent more manhours to construct the same ship as many foreign yards. This translates into an average of 2 to 3 years to build a commercial ship in a domestic shipyard, compared to approximately 12 to 16

1/ "CAD/CAM Key to U.S. Shipyard Revitalization," Marine Engineering/Log, October 1983, pp. 64-70.

2/ "Yards Modernize to Survive," Marine Engineering/Log, July 1984, pp. 31-33.

3/ A process lane is a series of fixed workstations provided with appropriate tooling and jigs to produce certain subassemblies whose fabrication and assembly involve the application of a sequence of production processes which involve a common set of manufacturing problems, Bruce J. Weiers, Transportation Systems Center, U.S. Department of Transportation, The Productivity Problem in United States Shipbuilding, 1984, p. 15.

4/ Preoutfitting involves the outfitting of as much of the subcomponents as possible before completion of the hull of the ship.

5/ "Yards Modernize to Survive, "Marine Engineering/Log, July 1984, pp. 31-34.

months for some foreign builders. This is explained in part, however, by the fact that the U.S. industry does not have the volume of work to engage in series production and therefore cannot benefit from the efficiencies of such production. An additional factor contributing to the long delivery time in U.S. yards is the difficulty in sourcing and slow delivery of component materials and parts. 1/

As stated earlier in this report, commercial ships in the United States cannot be mass produced because of the low unit demand. Shipbuilding is an extremely labor intensive industry, and vessels are almost custom-made to each order. According to industry sources, labor constitutes approximately 45 percent of the average cost of a commercial ship constructed in the United States. Both labor and material costs have risen significantly in recent years. According to statistics published by the Maritime Administration, Office of Shipbuilding Costs, the index value of estimated material costs (in constant dollars) for the U.S. shipbuilding industry was 329 in 1979 (1939=100), while labor costs were 414. By 1984, these index values had risen to 447 for materials and 621 for labor costs. Figure I illustrates how steeply total costs have risen during the past 10 years alone, compared with previous periods.

Industry sources indicate that, in recent years, the ship-repair industry has placed more emphasis on higher technologies because of the increasing complexity of repair and conversion work. Another growing trend in ship repair technology is the use of sea-ship repair crews. Many commercial repair firms have their own "repair squads" that perform underway maintenance and repair work. The increased use of diesel propulsion for merchant vessels has helped create this need for on-board repair services. 2/ The processes and the level of technology required in building new ships is also applicable to commercial vessel conversion and reconversion.

U.S. Industry Profile

U.S. producers

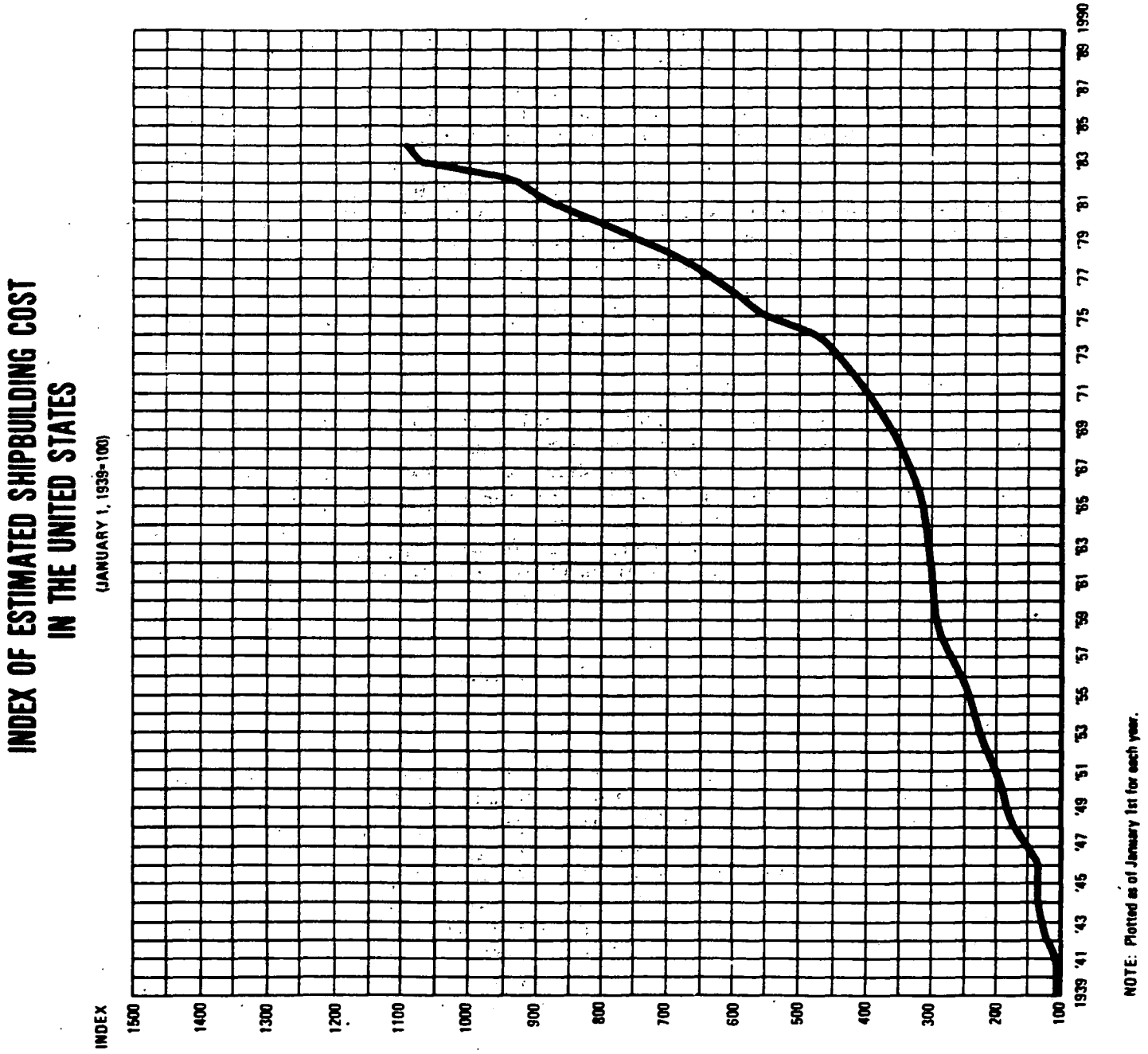
In terms of available facilities, the United States has the largest shipbuilding industrial base in the Western World. There were 581 firms operating an estimated 687 establishments producing and repairing commercial and military ships in 1982, according to the 1982 Census of Manufactures. In addition, there are numerous establishments in other industries that manufacture components used to construct or repair these oceangoing vessels. In general, shipbuilding and repairing establishments can be classified into four basic categories: major shipyards engaged in the construction and repair of ships; major ship repair and drydock facilities; smaller shipyards that service inland waterways and coastal commerce; and topside repair

---

1/ National Advisory Committee on Oceans and Atmosphere, Marine Transportation in the United States: Constraints and Opportunities, January 1983, p. 47.

2/ Data obtained from officials of the U.S. Department of Transportation, Maritime Administration, December 1984.

Figure 1.--Index of estimated shipbuilding costs in the United States, 1939-84. 1/



1/ In constant dollars.

Source: U.S. Department of Transportation, Maritime Administration, Office of Shipbuilding Costs.

facilities. 1/ According to the Maritime Administration, there are currently only 24 major shipyards in the United States, compared with 27 in 1979. A major shipyard is defined as one having at least one shipbuilding position, either an inclined way, a side-launching platform, or a building basin, with the capacity to accommodate a minimum of two ships of 475 feet in length with a beam of 68 feet. 2/ Generic shipyard characteristics include their adjacency to waterways; their spaciousness; and their ability to perform large construction projects with a labor-intensive working environment. 3/ These shipyards employ roughly 68 percent of the total employees in the U.S.-shipbuilding and repair industry. 4/ Of the 24 major yards, however, only 18 are available for commercial shipbuilding. These U.S. shipyards are capable of performing new construction and all phases of repair work. Data received in response to Commission questionnaires indicate that the majority of larger commercial shipbuilders are subsidiaries or divisions of large corporations, none of which are foreign owned or controlled. The locations of the commercial yards are shown in table 1. The geographic concentration of the commercial shipyards has shifted during the last 7 to 8 years, according to the 1982 Census of Manufactures. In 1982, the majority of the industry's employment was located in Virginia, Louisiana, California, and Connecticut, compared with 1977, when these States represented less than one-fourth of the total.

Major repair and drydock facilities are generally not engaged in the construction of ocean-going vessels, although some do perform construction if the business is available. The Maritime Administration defines these facilities as having at least one drydock or marine railway that can accommodate vessels of 300 feet or longer. At the present time, approximately 71 U.S. shipyards are capable of drydocking ships of this size. Major ship repairers are often integrated with commercial shipbuilders, thus providing flexibility of manpower. However, ship repair, overhaul, and conversion facilities differ somewhat from those utilized for new construction. Structural fabrication is less important in repair yards, whereas it is a vital part of ship construction. 5/ The largest of these major facilities are listed in table 2.

1/ Main Hurdman/KMG, Profile of the Shipbuilding and Repairing Industry, Oct. 1, 1984, p. 4.

2/ U.S. Department of Transportation, Maritime Administration, Report on Survey of U.S. Shipbuilding and Repair Facilities 1983, December 1983, p. 3.

3/ Speech by Ray Ramsay, Director of the Office of Maritime Affairs and Shipbuilding Technology, NAVAL Sea Systems Command, "Shipbuilding - A National Defense Asset," May 17, 1984.

4/ U.S. Department of Commerce, U.S. Industrial Outlook, 1985, p. 2.

5/ U.S. Department of Commerce, U.S. Industrial Outlook, 1985, p. 14.

Table 1.--Commercial ships: Major U.S. shipyards and their locations, 1984

Name	Location
ADDSCO Industries, Inc	Mobile, AL.
Avondale Shipyards, Inc	New Orleans, LA.
Bath Iron Works Corp	Bath, ME.
Bay Shipbuilding Corp	Sturgeon Bay, WI.
Bethlehem Steel Corp	Beaumont, TX.
Bethlehem Steel Corp	Sparrows Point, MD.
General Dynamics Corp.-Quincy Division	Quincy, MA.
Halter Marine Corp	Chickasaw, AL.
Levingston Shipbuilding Co	Orange, TX.
National Steel and Shipbuilding (NASSCO)	San Diego, CA.
Newport News Shipbuilding and Drydock Co	Newport News, VA.
Norfolk Shipbuilding & Drydock Corp	Norfolk, VA.
Pennsylvania Shipbuilding Co	Chester, PA.
Tacoma Boatbuilding Co	Tacoma, WA.
Tampa Shipyards, Inc	Tampa, FL.
Todd Shipyards Corp.-Galveston Division	Galveston, TX.
Todd Pacific Shipyards Corp.-Los Angeles Division.	Los Angeles, CA.
Todd Pacific Shipyards Corp.-Seattle Division	Seattle, WA.

Source: U.S. Department of Transportation, U.S. Maritime Administration, Office of Shipbuilding Costs.

Table 2.--Commercial ships: Major U.S. ship repair facilities and their locations, 1984

Name	Location
Bender Shipbuilding & Repair	Mobile, AL.
Coastal Dry Dock & Repair Corp	Brooklyn, NY.
Dillingham Marine & Manufacturing	Portland, OR.
Derecktor of Rhode Island, Inc	Middletown, RI.
FMC Corp	Portland, OR.
Jacksonville Shipyards	Jacksonville, FL.
Marine Power & Equipment Co	Seattle, WA.
North Florida Shipyards	Jacksonville, FL.
Northwest Marine Iron Works	Portland, OR.
Southwest Marine, Inc	San Diego, CA.
Todd Shipyards Corp	San Francisco, CA.
Triple A Shipyards	Hunters Point, CA.
Metro Machine Corp	Norfolk, VA.
Braswell Shipyards	Charleston, SC.

Source: Main Hurdman/KMG, Profile of the Shipbuilding and Repairing Industry, and U.S. Department of Transportation, Maritime Administration, Report on Survey of U.S. Shipbuilding and Repair Facilities 1983.

Of the 300 small to medium shipyards estimated to be operating in the United States, 250 are believed to be still active. The majority of the shipyards, which are located in all geographic areas of the United States, build and repair smaller commercial vessels, such as tugboats, barges, crewboats, fishing, and supply boats, which are almost exclusively engaged in domestic commerce. 1/ These shipyards are not included in this report.

Major topside repair facilities are those that have the capacity to provide repair service to oceangoing vessels without removing the ship from the water. Topside repair facilities typically lease pier space on a job basis and do not have any type of drydocking installation. Services rendered by these firms can vary from a simple repair operation to a major topside overhaul. According to the U.S. Maritime Administration, there are 136 major topside repair facilities in the United States, 59 of which are located on the East Coast. 2/ In general, these facilities are not included in this study, unless they performed repair services on oceangoing ships equal to or exceeding 1,000 grt.

Because of the decrease in commercial shipbuilding activity, a number of U.S. shipyards have ceased operation. These facilities are located throughout the United States, and their closings have severely reduced employment in the

1/ Main Hurdman/KMG, Profile of the Shipbuilding and Repairing Industry, Oct. 1, 1984, p. 8.

2/ U.S. Department of Transportation, Maritime Administration, Report on Survey of U.S. Shipbuilding and Repair Facilities 1983, December 1983, pp. 45-46.

industry. A listing of the shipyard closings is shown in table 3. According to a Congressional survey released in early 1984, eight additional yards are in danger of closing, and a ninth yard was reported to be in serious financial difficulty. 1/

Table 3.--Commercial ships: U.S. shipyard closings, and their locations, 1979-84

Name	Location	Date of closure
Seatrain Shipbuilding Corp	Brooklyn, NY	1979
Craig Brothers Marine Railways	Norfolk, VA	1979
Hillstrom Shipbuilding Corp	Coos Bay, OR	1979
Wilmington Iron Works	Wilmington, CA	1979
Bethlehem Steel Corp	San Pedro, CA	1980
Braswell Shipyards, Inc	Boston, MA	1980
Texas Shipbuilding Co	Houston, TX	1980
Rumsey Marine & Drydock Co	Wilmington, NC	1980
Willamette Iron & Steel Co	Portland, OR	1981
Ira S. Bushey & Sons	Brooklyn, NY	1981
American Ship Building Co	Chicago, IL	1982
Bethlehem Steel Key Highway	Baltimore, MD	1982
California Shipbuilding & Drydock Co.	Long Beach, CA	1982
Richmond Drydock & Marine Repair.	Richmond, CA	1982
American Ship Building Co	Toledo, OH	1983
Burton Shipyard	Port Arthur, TX	1983
Todd Shipyards Corp.- Houston Division.	Houston, TX	1983
Galveston Shipbuilding	Galveston, TX	1983
Bethlehem Steel Corp	Fort McHenry, MD	1983
Matton Shipyard	Cohen, NY	1983
American Ship Building Co	Lorain, OH	1983
Atkinson Marine	National City, CA	1983
Wiley Manufacturing	Port Deposit, MD	1984
Horne Brothers	Newport News, VA	1984
Maryland Shipbuilding & Drydock.	Baltimore, MD	1984
Savannah Shipyard	Savannah, GA	1984
Geosource, Inc	Harvey, LA	1984
Teh Tung Steamship	Houston, TX	1984
Zidell Explorations	Portland, OR	1984

Source: Shipbuilders Council of America.

1/ Speech by Paul J. Burnsky, President, Metal Trades Department, AFL-CIO, at the 3rd Biennial Metal Trades Department Shipbuilding Conference, Nov. 14, 1984.

Purchasing process

The process of purchasing a commercial vessel typically begins with the shipowner soliciting bids from shipbuilders in the United States and abroad. The sales offices of the larger shipbuilders remain in contact with potential ship purchasers. Often the shipyard will offer designs and even perform some initial engineering work in order to solicit the sale. The marketing efforts of the U.S. shipbuilding industry are basically concentrated within the United States.

Regarding terms of sale typically offered by the domestic shipbuilding industry, respondents to the Commission's questionnaire noted that an initial downpayment of 15 to 20 percent is sought, with progress payments made every 1 to 2 months, often depending on the amount of work completed. The payment period varies from 1 to 36 months, with 24, 30, and 36 months being the most commonly noted by questionnaire respondents. In the commercial ship-repair market, shipowners are billed upon the completion of the work. However, if the repair, conversion, or reconversion requires more than 1 month to complete, progress payments are normally required.

Construction and repair activity

The value of both U.S. commercial shipbuilding and repair work rose from $2.9 billion in 1979 to $3.2 billion in 1980, its highest level during the 6-year period (table 4). Economic activity then declined annually to $2.5 billion in 1983. In 1984, this figure further declined to an estimated

Table 4.--Commercial ships: U.S. producers' construction and repair work, 1979-84

(In millions of dollars)

Item	1979	1980	1981	1982	1983	1984 1/
Construction of commercial ships	1,890	1,810	1,542	1,240	873	600
Repair of commercial ships	1,052	1,397	1,601	1,588	1,596	915
Total	2,942	3,207	3,143	2,878	2,469	1,515

1/ Estimated by the staff of the U.S. International Trade Commission on the basis of data supplied by the Shipbuilders Council of America.

Source: Shipbuilders Council of America and the U.S. Department of Transportation, Maritime Administration, except as noted.

$1.5 billion. However, in constant dollar terms (1972=100), construction and repair activity declined from $1.6 billion in 1979 to an estimated $571 million in 1984.

The construction value of new commercial ships fell dramatically during this period from $1.9 billion in 1979 to an estimated $600 million in 1984, or by 68 percent (table 4). While the number of commercial ships built in the United States fluctuated somewhat, industry sources indicated that gross tonnage of these vessels decreased annually. This is because the majority of new construction in recent years has been confined to ships for domestic trade. These vessels are generally smaller than those used in foreign trade. Deliveries of U.S.-built commercial vessels are shown in table 5. Industry officials indicate that, for the most part, only tankers, LNG's, break/bulk cargo ships, dry-bulk carriers, and containerships are used in foreign trade.

Table 5.--Commercial ships: Deliveries of new U.S.-built ships, by types, 1979-84

Item	1979	1980	1981	1982	1983	1984
Tug boats/barges	0	0	3	5	2	2
Self propelled hopper dredges	1	2	2	2	2	0
Tuna purseiners	1	2	2	2	0	0
Tankers	7	2	6	3	4	3
Liquified natural gas carriers	4	5	0	0	0	0
Great Lakes ore carriers	3	3	3	0	0	0
Ferries	0	3	4	1	1	0
Break/bulk cargo ships	0	2	0	0	0	0
Lighter aboard ships (LASH's)	0	1	1	0	0	0
Dry bulk carriers	0	0	1	2	0	0
Containerships	2	3	0	2	4	0
Other ships	2	0	0	0	2	0
Total	21	23	22	17	15	5

Source: Shipbuilders Council of America.

Respondents to the Commission's questionnaire attribute the declines in both deliveries and value of new commercial construction to strong competition from foreign shipbuilders and the elimination of the U.S. construction-differential subsidy by the Department of Transportation. 1/

The reduction of offshore drilling rigs has also aggravated the decline in U.S. shipyard workload. These drilling rigs represented an important portion of the marine construction activity in past years. However, due to the economic recession, energy conservation, and an oil glut, many of the existing drill rigs are not currently in use. The shipyards on the gulf coast have been those most seriously affected by this decline. The decrease in drill rig orders, as well as orders for other merchant vessels over the 6-year period, is shown in the following tabulation. 2/

1/ The U.S. construction-differential subsidy is discussed on pages 48-49.

2/ Department of Defense, Coordinator of Shipbuilding, Conversion, and Repair, Annual Report on the Status of the Shipbuilding and Ship Repair Industry of the United States 1983, December 1984, pp. 3-2 and 3-3, and information supplied by the Shipbuilders Council of America.

Jan 1.--	Drill rig orders	Merchant ship orders	Merchant ship orders (in gross tons)
1979----------	23	21	487,200
1980----------	35	7	116,200
1981----------	72	8	148,000
1982----------	66	3	19,900
1983----------	22	7	102,200
1984----------	6	5	227,400

Industry sources indicate that the commercial ship-repair market has become more important in recent years as new orders for commercial ships have declined. The demand for ship-repair services is dependent on a number of factors, including the level of world trade, the world fleet size, and the fleet characteristics required to carry that trade. Also, the level of shipping in a particular geographic area influences where repairs will be completed. The dollar value of the repair and conversion of commercial ships in U.S. shipyards rose from $1.1 billion in 1979 to an estimated $1.6 billion in 1983 (table 4). The dollar value of repair work in 1984 fell to an estimated $915 million, its lowest level during the 6-year period. Industry sources attribute the decline to the shipping industry's postponing of ship repairs and maintenance not urgently required. 1/ Even with this decline, however, the ship repair business has remained relatively stable during 1979-84. The reasons behind the apparent stability of the U.S. commercial ship-repair market (as opposed to commercial ship construction) are listed below:

- o the requirement that U.S. flag ships, and any ship receiving U.S. Government maintenance subsidies, have all necessary non-emergency repairs performed in the United States;
- o the volume of repair work for ships used solely in domestic trade has increased;
- o and the cost differentials between U.S. and other repair yards around the world have been narrowing, allowing domestic shipyards to become more competitive. 2/

However, industry officials assert that much of the commercial repair work on oceangoing vessels is being done overseas and that it is identified as emergency work to avoid payment of penalties. 3/

Ship conversion, however, has been an important activity for ship-repair firms in recent years because of the combination of high interest rates,

---

1/ U.S. Department of Commerce, U.S. Industrial Outlook 1985, p. 15.
2/ U.S. Department of Commerce, U.S. Industrial Outlook 1984, p. 33-3.
3/ Harlan K. Ullman and Paula J. Pettavino, Center for Strategic and International Studies, Georgetown University, Forecasts for U.S. Maritime Industries in 1989: Balancing National Security and Economic Considerations, November 1984, p. 17.

inflation, high new building costs, and depressed freight markets. Industry sources state that conversion activity tends to be higher in low-freight markets because owners attempt to maximize their revenues from existing assets. The service life of a ship is increased and maintenance costs are kept down with conversion. Also, cargo capacity is often increased. 1/

Military ship construction and repair constitutes the majority of the work currently being performed by the U.S. shipbuilding industry. Construction of military vessels rose from $2.5 billion in 1979 to $3.9 billion in 1983 (table 6). The U.S. Maritime Administration estimates that the value of new construction of military ships will total $3.8 billion in 1984. Repair of military vessels has also increased in importance as a mainstay of domestic shipyard activity. The value of repair of military ships

Table 6.--Military ships: U.S. producers' construction and repair work, 1979-84

(In millions of dollars)

Item	1979	1980	1981	1982	1983	1984
Construction of military ships	2,512	2,838	3,351	3,518	3,893	3,847
Repair and conversions of military ships	969	1,095	1,251	1,386	1,819	1,909
Total	3,481	3,933	4,602	4,904	5,712	5,756

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission and official statistics of the U.S. Department of Transportation, Maritime Administration.

rose annually during 1979-83, from $969 million to $1.8 billion. The major ship-repair activity for U.S. firms throughout the 1980's is expected to remain in Navy repair, alteration, and overhaul. It is estimated that these activities generated $1.9 billion in work for the U.S. industry in 1984.

Although shipbuilding and repair activities play a relatively minor role in the total domestic economy, it is considered by many people to be an important component of the U.S. industrial base for both commercial and national defense reasons. Of the estimated 100 major industries comprising the U.S. economy, Data Resources, Inc., estimates that seven industries depend on shipbuilding activity for approximately 2 percent of their production. These sectors include the shipbuilding sector itself, switchgear manufacturers, engine and turbine producers, manufacturers of metal doors, sash and trim, as well as producers of fabricated plate and ordnance and accessories. Industries such as steel mills, nonferrous metal producers, utilities, telecommunication equipment producers, and business services are also impacted by the level of shipbuilding and repair activies. Expenditures for ship construction have an economic multiplier effect of about 2.2,

1/ "Shiprepair Capacity," A Seatrade Study, August 1982, p. 25.

according to Data Resources, Inc. Therefore, each dollar spent for ship construction generates $2.20 in U.S. economic activity. 1/

According to data developed by the U.S. Department of Labor, Bureau of Labor Statistics (BLS), each $100 million in production or repair not undertaken by U.S. commercial shipyards translates into an estimated 3,000 workers displaced in all sectors of the economy (based on 1982 production/employment relationships). As shown in the following tabulation, the majority of these employees would be in U.S. shipyards, although important employment effects would also be felt in the steel production and fabrication industries: 2/

Industry sector	Displaced employment
	Number
Shipbuilding and repair	1,600
Steel production and fabrication	300
All other industries	1,100
Total	3,000

U.S. capacity and capacity utilization

The number of employees required to achieve maximum practical capacity to construct and repair commercial ships rose irregularly from 42,290 production workers in 1979 to 43,230 production workers in 1983 (table 7). This figure

Table 7.--Commercial ships: U.S. shipbuilders' and repairers' employment, capacity, and capacity utilization, 1979-84

Item	1979	1980	1981	1982	1983	1984
Capacity (workers 1/) number	42,290	42,290	42,290	42,440	43,230	42,140
Production workers----do----	33,600	19,317	20,282	21,233	10,853	7,926
Capacity utilization percent	79.5	45.7	48.0	50.0	25.1	18.8

1/ Measured in employment terms.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

fell to 42,140 employees in 1984. Capacity utilization, as indicated by the ratio of actual production workers to the preferred level of production

1/ Ralph M. Doggett, Data Resources, Inc., The Economic Impact of the U.S. Shipbuilding Industry, August 1982, pp. 2, and 9-10.

2/ Estimated by the staff of the U.S. International Trade Commission, using the BLS input-output model.

workers to obtain maximum practical capacity, decreased irregularly during 1979-84. In 1979 capacity utilization was 79.5 percent compared with 18.8 percent in 1984. Respondents to the Commission's questionnaire cited a lack of orders for both commercial construction and commercial repair services as the overwhelming rationale for the dramatic decline in capacity utilization.

Data compiled in response to Commission questionnaires indicate that building capacity for commercial shipbuilding has remained fairly constant during the 6-year period (table 8). Commercial shipbuilding capacity rose by only 4 percent, from 1.36 million grt in 1979 to 1.40 million grt in 1984. Table 9 illustrates the number of shipbuilding ways by maximum ship size of

Table 8.--Commercial ships: U.S. shipbuilders' production, capacity, and capacity utilization, 1979-84

Item	1979	1980	1981	1982	1983	1984
Capacity---------1,000 grt--	1,356	1,356	1,356	1,404	1,404	1,404
Production-------1,000 grt--	1,298	788	347	326	283	125
Capacity utilization percent--	95.7	58.1	25.6	25.8	20.2	8.9

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table 9.--Commercial ships: Shipbuilding ways of major U.S. private commercial shipyards, by regions and by maximum ship sizes, 1984

Item	475-650 ft	651-850 ft	851-1,050 ft	1,051-1,200 ft	1,201-1,600 ft
Atlantic coast------	84	64	20	7	3
Gulf coast----------	57	36	32	16	0
West coast----------	48	18	4	0	0
Great Lakes---------	23	13	7	1	0
Total----------	212	131	63	24	3

Source: Estimated by the staff of the U.S. International Trade Commission on the basis of data obtained from the U.S. Department of Transportation, Maritime Administration.

the major U.S. commercial shipyards in 1984. Capacity utilization, however, decreased drastically, falling from 95.7 percent in 1979 to 8.9 percent in 1984. These figures are based on an average of 2 work shifts per day, 5 days per week, 51 weeks per year. Again, the reason overwhelmingly cited by the domestic shipbuilding industry for the low level of capacity utilization was an insufficient level of new orders. Additional reasons noted include subsidized foreign competition and work stoppages due to strikes. In response to the question concerning the length of time required for their commercial

shipbuilding operations to expand to full practical capacity, 56 percent of the questionnaire respondents indicated 3 to 4 months would be necessary, 33 percent indicated 7 to 12 months, and the remaining 11 percent indicated 5 to 6 months.

U.S. ship repairers have been improving and expanding their facilities and capabilities. Although specific statistics are not available, industry sources indicate that the number of large drydocks in the United States has almost doubled in the past 10 years, with an accompanying increase in the total deadweight capacity. 1/ As shown in the following tabulation, questionnaire respondents indicated that capacity utilization of their commercial ship repair facilities fluctuated during 1979-84 (in percent): 2/

Year	Capacity utilization
1979	85.2
1980	72.1
1981	82.3
1982	60.7
1983	63.4
1984	62.0

Capacity utilization was 85.2 percent in 1979 compared with 62.0 percent in 1984. Industry officials attribute the decline to the decreasing number of U.S. flag ships 3/ and the increasing use of foreign facilities to repair these ships. Ship repairing firms, however, estimated that it would take less than 1 month to expand to their maximum practical repair capacity.

Employment and wages

Employment in the U.S. shipbuilding and repair industries fluctuates with the cyclical demand for its products. This industry, in particular, is susceptible to high personnel turnover as the result of variables outside the industry's control, including both U.S. and foreign government's industrial policies. According to the 1982 Census of Manufactures, the majority of U.S. shipyards employ fewer than 20 employees, while approximately 20 percent employ 1,000 or more workers.

During 1979-84, the estimated number of persons employed in U.S. shipbuilding and ship repairing establishments rose from 98,214 workers to

---

1/ Edwin Hood, "Tradition Proves No Ally for U.S. Repair Yards," Shiprepair, August, 1982, p. 25, and H.P. Drewry Ltd., The World Shiprepair Facilities-Outlook for the Next Ten Years, 1977, pp. 2-3.

2/ Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission. Capacity utilization data are based on an average of 2 work shifts per day, 6 days a week, 52 weeks per year.

3/ According to the U.S. Maritime Administration, a U.S. flag ship must be at least 75 percent owned by a U.S. citizen(s), must employ a crew of U.S. citizens, and must meet specific safety standards set by the U.S. Coast Guard and the American Bureau of Shipping.

Table 10.--Average number of employees and production and related workers in U.S. establishments producing commercial ships and providing commercial shipbuilding and repair services, 1979-84

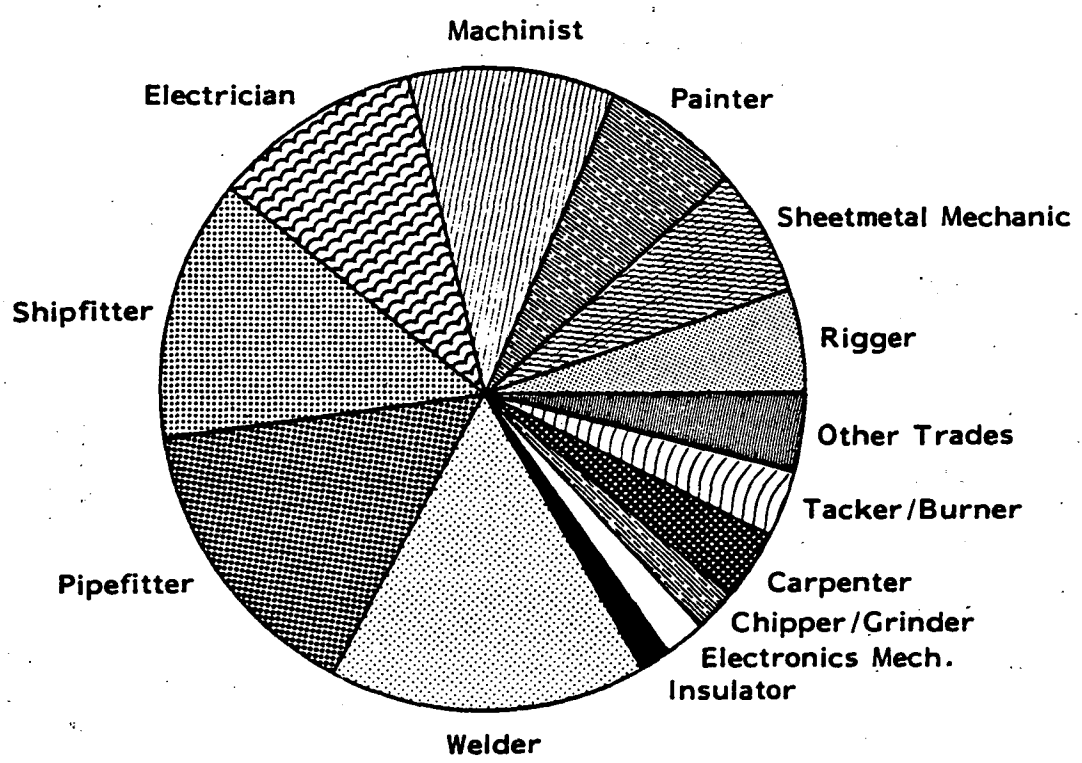
Item	1979	1980	1981	1982	1983	1984
Average number of persons employed in the reporting establishments.	98,214	102,054	105,666	101,807	102,482	105,686
Production and related workers engaged in the production and repair of--						
All products	84,473	86,787	89,729	86,828	86,558	89,880
Commercial ships	33,600	19,317	20,282	21,233	10,853	7,926

Source: Estimated by the staff of the U.S. International Trade Commission on the basis of data compiled in response to questionnaires of the U.S. International Trade Commission.

105,686 workers (table 10). Estimated employment of production workers in these yards for all products also increased from 84,473 persons in 1979 to 89,880 in 1984. Production workers engaged in the construction and repair of commercial ships decreased irregularly from 33,600 (estimated) in 1979 to 10,853 (estimated) in 1983. This figure further declined to an estimated 7,926 employees in 1984. Employment in the commercial ship business decreased because of a lack of new orders and the increased use of foreign builders and repairers in place of domestic companies by U.S. shipowners.

The shipbuilding and repair industries employ all levels of unskilled, and skilled labor. Most of the professionals, such as engineers, welders, electricians, machinists, painters, carpenters, and mechanics, are common to those of any industry that is engaged in the construction or repair of large metal structures. Other jobs, however, are very specific to shipbuilding and repairing and often these skills are not applicable to other industries. Some of these trades include shipfitter, pipefitter, rigger, and crane operator. A relative breakdown of the major trades in a typical shipyard is shown in figure 2.

Figure 2.--Division of labor in U.S. shipyards, by major trades, 1983.



Source: U.S. Department of Transportation, Maritime Administration, and the University of Michigan, The Status of Skilled Trades Training in U.S. Shipyards, December 1983.

Private shipyards have difficulty retaining skilled workers because of the lack of steady commercial work. Because the shipbuilding industry is extremely labor intensive, skilled workers are critical to its success. Training or retraining new employees in the production or repair of commercial ships is both an expensive and time-consuming process. Industry sources estimate that the training costs for replacing a skilled worker can exceed $25,000 per worker. 1/ The following tabulation shows the training time necessary for a shipyard worker to reach the journeyman level in the listed professions (in hours): 2/

Job	Training time
Welder	8,000
Shipfitter	8,000
Machinist	6,000
Electrician	8,000
Pipefitter	8,000
Rigger	8,000
Flame cutter	2,000
Crane operator	1,000
Marine draftsman	10,000
Shipwright	8 to 10 years

Virtually all of the U.S. shipyards are unionized. According to industry sources, the industry workforce is, in fact, over 90 percent unionized. Because of the large diversity of skills employed in the construction and repair of commercial ships, multiunion yards are the industry norm. The most prevalent unions in this segment of the marine industry are the Industrial Union of Marine and Shipbuilding Workers of America (IUMSWA), the International Brotherhood of Boilermakers, the Metal Trades Council of the AFL-CIO, the International Brotherhood of Electrical Workers, and the United Steelworkers of America.

Although specific figures are not available, U.S. shipyards are more dominated by union labor, especially in the crafts area, than most other U.S. industries. According to some industry officials, union influence has been considered a hinderance to increasing shipyard productivity. The most significant item in this regard is the rule that prohibits a union member of one occupation or classification from performing the work of another. For management, such rules mean a slowing down of production or the need to keep a larger work force than would be otherwise necessary. 3/ Often, union dominance of shipyard labor means that technological change must be

---

1/ National Advisory Committee on Oceans and Atmosphere, Marine Transportation in the United States: Constraints and Opportunities, january 1983, p. 47.

2/ Ray Ramsay, "A Time for Shipbuilding Renaissance," Naval Engineers Journal, September 1983, p. 56.

3/ U.S. Department of Transportation, Maritime Administration, Office of Shipbuilding Costs, An Analysis of Why the American Shipbuilding Industry Cannot Compete Internationally, July 1977, p. 28.

negotiated, which is time-consuming, and sometimes, extremely difficult. 1/ Union leaders contend that these rules help maintain employees' jobs, and ensure quality and safety. Additonally, they state that they have already made numerous concessions in this area in order to enhance productivity in the industry. 2/

Hours worked.--The standard shipyard work week consists of five 8-hour days (in shifts), an average of 51 weeks per year. Overtime is common, however, depending on the schedule requirements of different work areas of the shipyard. 3/ Data estimated from the Commission's questionnaire indicate that man-hours worked by production and related workers engaged in the construction and repair of all products increased irregularly during 1979-84, as shown in the following tabulation (in thousands of hours):

Year	Man-hours, all products	Man-hours, commercial ships
1979----------	148,850	67,297
1980----------	159,374	44,764
1981----------	165,270	52,736
1982----------	152,319	41,512
1983----------	146,852	21,004
1984----------	153,512	14,307

Estimated manhours worked by employees in only commercial business decreased by 79 percent, from 67.3 million hours in 1979 to 14.3 million hours in 1984.

Wages.--In U.S. shipyards, wages are almost universally time rated. Because of the large union component in the industry, the majority of these rates of pay are also subject to the bargaining process. Wage rates in the shipbuilding and repairing industries are higher than those paid to workers in all manufacturing industries but generally less than those paid in the construction industry of the United States. Table 11 illustrates those hourly wages and those paid in shipbuilding and construction firms. Data from respondents to the Commission's questionnaire indicate that shipyard workers received $8.00 per hour in compensation in 1979, compared with $12.34 in 1984. Bureau of Labor Statistics figures indicate that hourly shipyard compensation rose from $7.64 in 1979 to $10.99 in 1984. Also, shipyard employees normally receive higher wages for working second or third shifts. Wage rates in the U.S. shipbuilding and repair industy sometimes differ, however, according to geographic region. Industry sources indicate that wages paid on the west coast of the United States are slightly higher than wages for comparable work done in east coast shipyards.

1/ Congress of the United States, Office of Technology Assessment, An Assessment of Marine Trade and Technology, October 1983, p. 105.

2/ Meeting with officials of the Metal Trades Council, AFL-CIO, December 1984.

3/ Main Hurdman/KMG, Profile of the shipbuilding and Repairing Industry, Oct. 1, 1984, p. 24.

Table 11.--Hourly wages paid to production and related workers in all manufacturing, construction, and shipbuilding and repair, 1979-84

Year	All manufacturing industries	Construction industry	Shipbuilding and ship-repair industries	
			Commission questionnaire respondents	BLS statistics
1979	$6.69	$9.26	$8.00	$7.64
1980	7.27	9.94	9.61	8.54
1981	7.99	10.82	10.62	9.40
1982	8.49	11.63	11.70	10.23
1983	8.84	11.95	12.62	10.70
1984	1/ 9.39	1/ 12.16	12.34	2/ 10.99

1/ Data for December 1984.
2/ Data for November 1984.

Source: Compiled from official statistics of the U.S. Department of Labor, Bureau of Labor Statistics, and from data submitted in response to questionnaires of the U.S. International Trade Commission.

Estimated total wages paid to production and related workers in U.S. shipyards are shown in the following tabulation (in millions of dollars): 1/

Year	Wages paid (all products)	Wages paid (commercial ships)
1979	1,351	538
1980	1,550	430
1981	1,692	560
1982	1,675	456
1983	1,596	265
1984	1,589	176

Wages paid to workers for construction and repair of all products (estimated) rose from an estimated $1.4 billion in 1979 to $1.6 billion in 1984. For those employees engaged in working on commercial ships, total estimated wages decreased 67 percent during the same period, from $538 million to $176 million.

1/ Estimated from data compiled in response to questionnaires of the U.S. International Trade Commission.

Financial experience of the U.S. industry

Net sales for overall operations, as reported by respondents to the Commission's questionnaire, increased annually, from $3.4 billion in 1979 to $4.8 billion in 1983, or by 41 percent (table 12). In 1984, U.S. shipyards estimated their overall net sales at $4.9 billion. The domestic industry, however, realized the bulk of its sales volume from noncommercial work.

Table 12.--Commercial ships: U.S. shipyards' net sales and operating profit on their overall establishment operations and on commercial operations, 1979-84

Item	1979	1980	1981	1982	1983	1984
Overall operations:						
Net sales						
million dollars--	3,370	3,567	4,116	4,567	4,791	4,860
Operating profit or (loss) before income taxes 1/						
million dollars--	277	183	220	318	379	409
Ratio of operating profit or (loss) before income taxes to net sales						
percent--	8.2	5.1	5.3	7.0	7.9	8.4
Commercial operations:						
Net sales						
million dollars--	1,079	819	921	934	701	435
Operating profit or (loss) before income taxes 1/						
million dollars--	109	(3)	(3)	40	67	40
Ratio of operating profit or (loss) before income taxes to net sales						
percent--	10.1	(0.3)	(0.3)	4.3	9.6	9.2

1/ Gross profit.

Source: Estimated on the basis of data submitted in response to questionnaires of the U.S. International Trade Commission.

In 1979, over 32 percent of the industry's net sales were derived from commercial shipbuilding and ship repairing. By 1984, this figure had declined to less than 9 percent. Commercial net sales decreased from $1.1 billion in 1979 to $819 million in 1980. Sales totaled $921 million in 1981 and $934 million in 1982. By 1983, commercial net sales for the industry had fallen to $701 million. Questionnaire respondents estimated their net sales from commercial shipbuilding and ship repairing further declined to $435 million in 1984.

Estimated operating profits (gross profits before taxes) for overall establishment operations of the domestic industry followed a generally

increasing trend, rising from $277 million in 1979 to $409 million in 1984. Industry sources attribute much of the recent profitability to an increased level of U.S. Navy work. Profits solely from commercial shipbuilding and repairing fluctuated greatly, from an estimated high of $109 million in 1979 to an estimated loss of $3 million in 1980. In 1981 the industry also lost $3 million on its commercial operations. Profits then totaled $40 million in 1982 and $67 million in 1983. Questionnaire respondents indicated that profits would fall to $40 million in 1984. Although separate statistics are not available, industry sources indicate that repair activities, in general, are more profitable for U.S. firms than those realized from new commercial building.

Research and development

Respondents to the Commission's questionnaire reported research and development expenditures during 1979-84 as shown in the following tabulation (in thousands of dollars):

Year	Expenditure
1979	3,412
1980	6,389
1981	3,621
1982	3,302
1983	4,603
1984	2,116

The $6.4 million level reached in 1980 represented an increase of 87 percent over the amount expended in 1979. U.S. shipyards indicated that much of this research involved improved welding procedures, process lane construction methods, preoutfitting, standards development, surface preparations and coatings, and increased use of computer systems. Expenditures fluctuated throughout the 6 year period, falling to $2.1 million in 1984. One shipyard indicated that the main thrust of the current research and development being conducted by the domestic shipbuilding and repair industries is to produce simpler, more efficient systems, with reduced acquisition and maintenance costs.

In general, questionnaire respondents indicated a strong desire to retain research and development expenditures despite the low and unstable demand for commercial ships. This is due, in part, to the fact that many shipbuilding firms are owned by large conglomerates that are willing to absorb some of the financial risks associated with these investments. 1/ A recent survey conducted by the Office of Technology Assessment found that, for the shipbuilding industry (both commercial and military), the average amount a firm spent on research and development during 1979-83 was 1.3 percent of their operating budget. This amount was estimated to have risen to 1.7 percent in 1984. A large portion of these expenditures (51 percent) were found to

1/ Congress of the United States, Congressional Budget Office, Federal Support for Research and Development Innovation, April 1984, p. 71.

involve shipbuilding methods. Approximately 21 percent of the surveyed firms' research and development funds were spent on ship design, 14 percent on subsystem design and development, and 14 percent on miscellaneous research and development. 1/

The U.S. Government assists the domestic maritime industries through several programs outlined in the U.S. Government involvement section of this report. However, according to Government sources, much federally sponsored research for defense research and development is indirectly applied to merchant ship design and construction. The following tabulaton shows the U.S. Maritime Administration's reasearch and development appropriations and actual outlays for fiscal years 1979-84 (in thousands of dollars):

Fiscal year	Appropriation	Actual outlay
1979----------	22,100	19,400
1980----------	19,000	18,630
1981----------	14,900	13,700
1982----------	10,000	9,640
1983----------	15,900	15,300
1984----------	12,300	9,400

The appropriation for fiscal year 1985 is $12.9 million. 2/ These funds include both Government funded and industry cost-shared projects. A large portion of the MARAD research and development funds involve shipbuilding, ship machinery, ship structures, and advanced ship systems. However, first priority research in the near term will go towards defense related issues in the maritime industry. The results of these studies are to be turned over to the private sector whenever possible. In general, MARAD sources indicate that future research will be geared toward broadly based projects which benefit shipbuilders, ship repairers, and ship operators. 3/

The U.S. Navy's Manufacturing Technology Program (MANTECH) is devoted to the adoption of advanced production equipment and processes in order to reduce the cost and delivery time of Navy systems. Their expenditures and planned expenditures regarding ships for fiscal years 1983-1986 are shown in the following tabulation (in thousands of dollars): 4/

Fiscal year	Expenditure
1983----------	10,270
1984----------	19,120
1985----------	21,370
1986----------	24,700

1/ Congress of the United States, Office of Technology Assessment, R&D In the Maritime Industry (draft), December 1984, pp. 508.

2/ Telephone conversation with officials of the U.S. Department of Transportation, Maritime Administration, Research and Development Program, Jan. 15, 1984.

3/ Op. cit., R&D In the Maritime Industry, p. 13.

4/ Op. cit., R&D In the Maritime Industy, appendix B, p. 2.

However, as discussed under the U.S. Government involvement section of this study, the results of this research often are applied to commercial applications.

U.S. shipbuilding and ship repairing industry sources indicate that increased research and development expenditures are necessary to rejuvenate the industry. However, with the lack of new commercial business there is a shortage of capital available for research. Even with increased research and development, industry observers assert that the industry will remain less competitive than many foreign shipyards. This is due, in part, to the fact that the United States lags in its own research and to the introduction of its own innovations based on this research.

Capital expenditures

Since the Merchant Marine Act was amended in 1970, the domestic shipbuilding and repairing industries have expended over $3.1 billion for capital improvements. 1/ As shown in table 13, capital expenditures for domestic facilities for production and repair of commercial ships, as reported in response to the Commission's questionnaire, decreased from $96.2 million in 1979 to $89.3 million in 1980. Expenditures then rose over the next 2 years,

Table 13.--Commercial ships: U.S. shipbuilders' and repairers' capital expenditures for domestic facilities, by major types, 1979-84

(In thousands of dollars)

Item	1979	1980	1981	1982	1983	1984 1/
Land or land improvements	2,200	4,650	2,300	11,015	4,035	1,090
Building or leasehold improvements	14,709	20,574	18,062	43,384	19,682	13,559
Machinery, equipment, and fixtures:						
New	78,291	63,193	97,002	105,134	67,795	48,280
Used	569	580	2,167	14,592	1,398	819
All other	462	349	204	619	484	185
Total	96,231	89,346	119,735	174,744	93,394	63,933

1/ Estimated by questionnaire respondents.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

1/ U.S. Department of Defense, Coordinator of Shipbuilding, Conversion and Repair, Annual Report on the Status of the Shipbuilding and Ship Repair Industry of the United States, 1983, December 1984, p. 4-4.

to $174.7 million in 1982. Capital expenditures then fell to $93.4 million in 1983 and to an estimated $63.9 million in 1984. The vast majority of these expenditures were for building or leasehold improvements and new equipment. Industry sources indicate, however, that prior to 1980, little investment was made in advanced-technology equipment, as was the case in many foreign shipyards. Capital expenditures during the period primarily focused on increasing shipbuilding capacity and upgrading existing facilities. Important advances have been made in the past 4 years in the areas of welding machinery, automated pipe fabrication, and production using CAD/CAM. 1/ U.S. shipbuilders and ship repairers indicated that they made no capital expenditures for foreign facilities during 1979-84.

Regarding the ability of U.S. shipbuilders and repairers to raise capital for facilities improvement, questionnaire respondents indicate that lack of new commercial orders and the absence of a national maritime policy within the last 2 to 3 years has hindered their efforts in this area. Many shipyards are considered poor financial risks and, therefore, cannot obtain the financing or bonding necessary for capital improvements.

Foreign trade

Imports of commercial vessels are not subject to the provisions of the Tariff Schedules of the United States Annotated. For this reason, there are no official statistical data available on U.S. imports of these ships. However, industry sources indicate that in the last 6 years the vast majority of new commercial vessels purchased by U.S. shipowners were built in foreign shipyards, mainly located in Asia.

The United States has not built any merchant vessels for non-U.S. purchasers in over 20 years. 2/ This is predominately due to the fact that these ships can be bought from foreign shipbuilders at much lower prices. However, some U.S. maritime products other than merchant ships are competitive in world markets. These products include tuna, lobster and shrimp fishing boats, offshore drilling rigs, and offshore servicing ships. 3/

Commercial shipbuilding and repairing supplier industry

The sharp decrease in commercial shipbuilding and ship repairing activity in the United States has also affected the suppliers of subcomponents for these vessels. Many of these firms have left the industry or have devoted the majority of their work to supporting military shipbuilding or more stable nonmarine industries. The supplier base is extremely important to merchant vessel construction, as almost 50 percent of the cost of a commercial ship is

---

1/ Ibid.

2/ Data supplied by the Shipbuilders Council of America.

3/ National Advisory Committee on Oceans and Atmosphere, Marine Transportation in the United States: Constraints and Opportunities, January 1983, p. 47.

for purchased materials and components. 1/ As outlined in more detail later in this report, the reduction in the supplier base of the maritime industry has been cited by industry sources as one reason for the higher construction and repair costs and longer ship construction time of the U.S. industry.

In the United States, the maritime-supporting industries do not regard the commercial-ship industry as their prime customer. In a survey conducted of suppliers to the shipbuilding industry, only 81 percent indicated that they are currently supporting the marine industry, with 71 percent of these respondents stating that they are directly involved with U.S. Navy shipbuilding. Also many firms indicated that they are working at only 70 percent of full capacity. 2/ Because of the sporadic demand for commercial shipbuilding and repair, the attention to the specific needs of this industry by component producers is minimal. Equipment and services available are often derivations of products sold to land-base industries or versions of U.S. Navy equipment. 3/

Industry sources indicate that the number of U.S. shipbuilding support firms is small compared with their European and Japanese counterparts (table 14). The firms listed in table 14 do not reflect the entire domestic or foreign support industry; however, they represent those firms that have expressed an interest in international sales of shipbuilding components. The following comparison of the number of component firms in the United States and in Europe and Japan gives a reasonable indication of the state of the U.S. supplier base vis-a-vis its foreign competitiors.

In conclusion, because of the decline in commercial maritime opportunities, many of the firms that manufacture components are withdrawing from this business. As a result, purchase of foreign-built components is frequently necessary. 4/ As shown in table 15, foreign sourcing of certain major components and services has fluctuated during the 6-year period, totaling $50.5 million.

1/ Bruce J. Weiers, U.S. Department of Transportation, Transportation Systems Center, The Productivity Problem in United States Shipbuilding 1984, pp. 53-55.

2/ Ray Ramsay, "A Time for Shipbuilding Renaissance," Naval Engineers Journal, September 1983, p. 52.

3/ U.S. Department of Transportation, Maritime Administration, Office of Shipbuilding Costs, An Analysis of Why the American Shipbuilding Industry Cannot Compete Internationally, July 1977, p. 21.

4/ Interview with officials of Avondale Shipyards, Inc., Jan. 9, 1985.

Table 14.--Commercial ship components: Number of major U.S., European, and Japanese manufacturers, by types, 1983

Component	U.S. firms	European and Japanese firms
Air conditioning plants	3	26
Anchors	1	15
Bearings	8	29
Boilers	16	32
Cable, electric	38	28
Chain	1	20
Compressors	13	34
Condensors	9	11
Consoles and control equipment	26	50
Deck cranes	18	24
Engines, diesel	17	98
Gears, reduction	9	24
Generators	69	64
Hydraulic power equipment	10	22
Motors, electric	20	29
Propellers	10	45
Pumps	15	66
Steering gear	10	17
Switchboards	14	52
Turbines	7	23
Valves	45	118
Winches	20	33
Windlass	14	26

Source: Ray Ramsay, "A Time For Shipbuilding Renissance," Naval Engineers Journal, September 1983, p. 52.

Table 15.--Components of commercial ships: Purchases of selected foreign-built components and services by U.S. shipbuilders and repairers, by types, 1979-84

(In thousands of dollars)

Item	1979	1980	1981	1982	1983	1984
Materials:						
Engines	6,344	7,564	13,210	-	-	8,321
Propellers	145	129	362	-	-	-
Motor generator sets	-	3,498	4,441	30	-	2,154
Cranes	-	-	720	1,497	119	-
Engineering services	-	1,459	-	-	16	497
Total	6,489	12,650	18,733	1,527	135	10,972

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Although this figure represents a small percentage of the total components purchased for commercial shipbuilding and repairing, the issue of foreign-sourced component acquisition has generated significant interest in the maritime community. A study has been proposed by the Maritime Administration on the impact of foreign component purchases by the U.S. shipbuilding industry titled "The Comparison of U.S. and Foreign Costs For Shipbuilding Materials and Components." The study will attempt to assess the effect these purchases have had on the price and the time necessary to construct commercial vessels in U.S. shipyards. The report has been scheduled to be performed during fiscal year 1985. 1/

U.S. Government Involvement

The U.S. Government has traditionally supported the domestic maritime industry. During 1979-84, the Government provided a variety of support programs to the industry, including ownership of shipbuilding facilities, research and development assistance, preferential tax policies, direct and indirect subsidies, export promotion, and other miscellaneous programs. These activities are sponsored by a number of agencies, including the Department of Transportation (Maritime Administration), the Department of Defense, the Department of Commerce, the Department of Labor, and the Export-Import Bank. Each assistance program is discussed in the following sections.

Ownership of facilities

There were nine Government-owned shipyards in the United States in 1984; eight of them were Navy yards and one was owned by the U.S. Coast Guard. These shipyards, and their locations are shown in the following tabulation: 2/

Shipyard	Location	Owner
U.S. Coast Guard Yard-Curtis Bay	Baltimore, MD.	U.S. Coast Guard
Charleston Naval Shipyard	Charleston, S.C.	U.S. Navy
Norfolk Naval Shipyard	Portsmouth, VA.	U.S. Navy
Philadelphia Naval Shipyard	Philadelphia, PA.	U.S. Navy
Portsmouth Naval Shipyard	Portsmouth, NH.	U.S. Navy
Long Beach Naval Shipyard	Long Beach, CA.	U.S. Navy
Mare Island Naval Shipyard	Valleja, CA.	U.S. Navy
Pearl Harbor Naval Shipyard	Pearl Harbor, HA.	U.S. Navy
Puget Sound Naval Shipyard	Bremerton, WA.	U.S. Navy

Navy facilities have not built any vessels since 1967 when the U.S. Government decided to allocate all new construction to private yards. The Federally owned shipyards, however, are currently performing overhaul and repair services for

---

1/ Interview with officials of Avondale Shipyards, Inc., Jan. 9, 1985.
2/ Telephone interview with officials of the U.S. Department of Transportation, Maritime Administration.

military combat ships. Industry sources indicate, however, that the U.S. Government is attempting to gradually dispose of its naval shipyards. 1/

Research and development

There are several Federally sponsored research and development programs that assist the commercial shipbuilding industry. The majority of the research in this area is administrated by the U.S. Maritime Administration. However, research is also conducted by the Department of Defense, the U.S. Navy, and the U.S. Coast Guard.

The National Shipbuilding Research Program is the principal research and development program that benefits the domestic industry. This program is carried out and jointly sponsored by the Maritime Administration, the Society of Naval Architects and Marine Engineers (SNAME), and a number of private U.S. shipyards. It provides financing and management of research projects to improve the productivity of domestic shipyards and increase their competitiveness in the world market. The program, initiated in 1971, provides for industry involvement in technical management and execution with the assistance of SNAME. The research is managed by government-industry panels that exchange technical information, identify new problems, and recommend opportunities for research and development. The cost of research projects is shared by the leading U.S. shipyards and the U.S. Government. 2/

In 1974, as part of the U.S. Government's support of the industry, MARAD selected the Illinois Institute of Technology's Research Institute to conduct research into the introduction of computer-aided manufacturing into U.S. shipbuilding. According to industry sources, this program has grown since its inception and is now jointly funded by the shipbuilding industry and the U.S. Government. 3/

According to industry sources, Government and industry cost sharing is the key element in most Federal research and development in the shipbuilding industry. During fiscal year 1983 (the latest year for which data are available), MARAD committed $15.3 million to maritime research projects. The maritime industry contributed an additional $5 million. 4/ According to the Maritime Administration, approximately one-fourth of annual total maritime research and development expenditures is devoted to shipbuilding and repair research. The 1985 fiscal year approved budget for research and development programs administered by MARAD is $12.9 million, down considerably from the 1984 figure. 5/

1/ National Advisory Committee on Oceans and Atmosphere, Marine Transportation in the United States: Constraints and Opportunities, January 1983, p. 47.

2/ Marine Board, Commission on Engineering and Technical Systems, National Research Council, Productivity Improvements in U.S. Naval Shipbuilding, 1982, p. 20.

3/ Ibid., pp. 21-22.

4/ U.S. Department of Transportation, Maritime Administration, MARAD '82, February 1984, p. 34.

5/ The Congress of the United States, Congressional Budget Office, U.S. Shipping and Shipbuilding: Trends and Policy Choices, August 1984, p. 64.

Since most U.S. shipyards perform or are capable of performing both military and commercial work, much of the research and development performed for military shipbuilding can assist in increasing productivity and efficiency in commercial shipbuilding and ship repair. In 1979, there were 44 U.S. private shipyards engaged in naval shipbuilding and/or repair activities, compared with 57 in 1984 (table 16). Industry observers indicate that the commercial activities of these shipyards would benefit from much of the naval research and development. Some of the specific military related research and development programs are discussed below.

The U.S. Navy maintains a manufacturing technology program, which indirectly benefits the domestic shipbuilding industry, called the Manufacturing Technology Program. The focus of this program is the development and execution of projects whose objectives are advancing manufacturing technology and providing first-of-a-kind applications to industrial operations. The majority of the projects sponsored under MANTECH involve U.S. Government indemnification of manufacturers' innovations. According to industry sources, the main thrust of the shipbuilding technology initiative of MANTECH is to transfer to Naval shipbuilding applicable advanced

Table 16.--U.S. private shipyards performing naval construction and/or repair work, by types of work performed, 1979-84

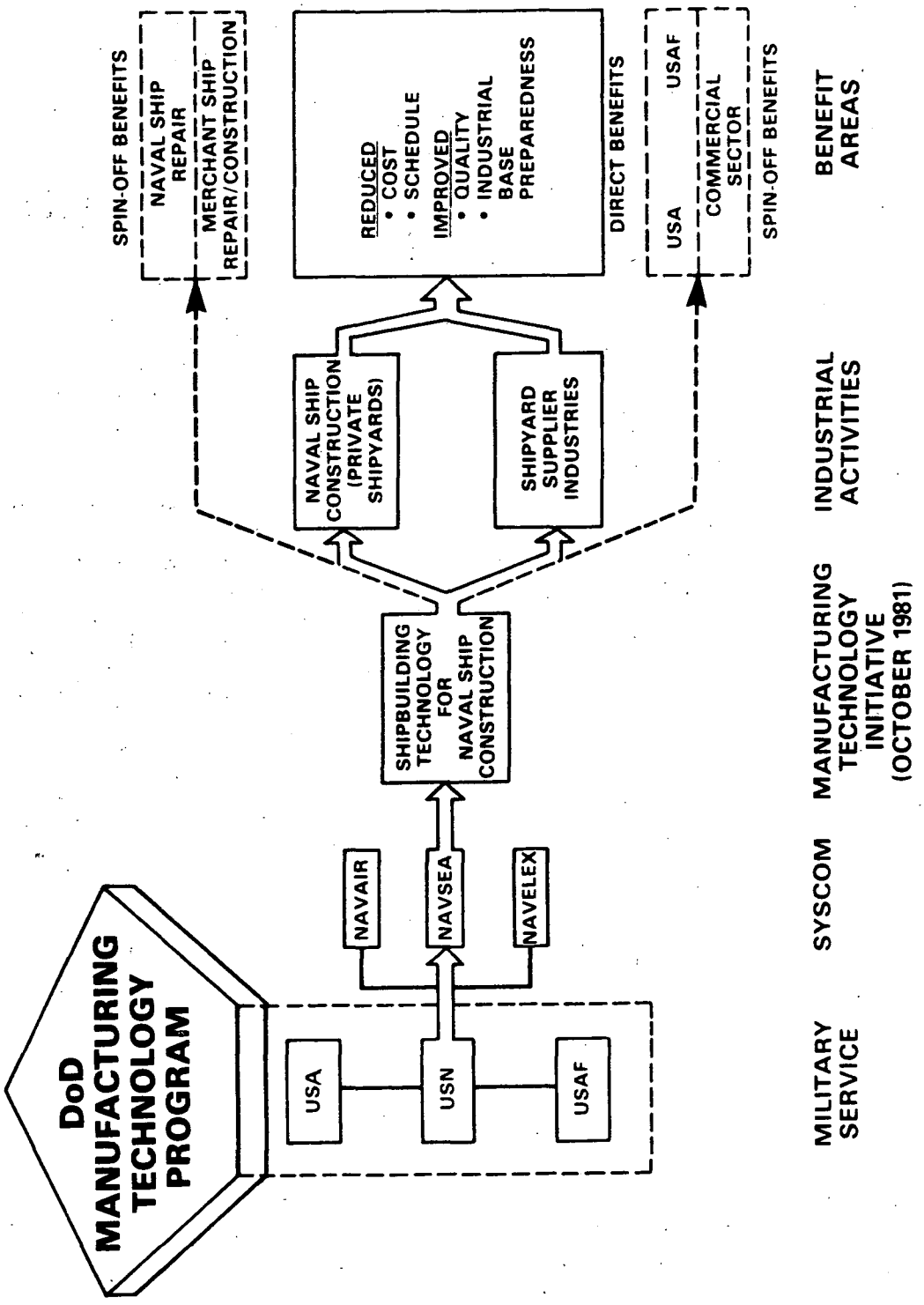
Item	1979	1980	1981	1982	1983	1984
Construction only	5	4	6	9	11	10
Conversions and repair only	31	39	35	32	35	39
Construction and conversions and repair	8	8	7	8	8	8
Total	44	51	48	49	54	57

Source: Harlan K. Ullman and Paula J. Pettavino, Center for Strategic and International Studies, Georgetown University, Forecasts for Maritime Industries in 1989: Balancing National Security and Economic Considerations, November 1984, p. 15.

production technologies already proven in other industries. 1/ The program will not buy capital or research equipment, but will provide "seed money" for projects whose feasibility has been demonstrated. Industry sources indicate that the results of MANTECH-supported programs are frequently provided to industry through the Manufacturing Technology Journal, the National Technical Information Service, and the Defense Technical Information Center. As illustrated in Figure 3, commercial ship repair and construction often benefits from spin-offs of these technological innovations.

1/ Marine Board, Commission on Engineering and Technical Systems, National Research Council, Productivity Improvements in U.S. Naval Shipbuilding, 1982, pp. 21-22.

Figure 3.--Department of Defense Manufacturing Technology Program.



Source: Marine Board, Committee on Engineering and Technical Systems, Productivity in U.S. Naval Shipbuilding, 1982.

Tax policies

According to the U.S. shipbuilding industry, certain tax policies effectively hinder domestic shipyards from competing in the international market. The legislation most often noted in this regard is the Omnibus Budget Reconciliation Act of 1981, which affords American ship operators certain tax benefits whether or not they are utilizing vessels constructed in foreign shipyards. U.S. shipbuilders contend that this has served to significantly reduce their construction opportunities. 1/

However, shipyards, like other businesses, qualify for the investment tax credit for new investment in capital equipment under the Internal Revenue Code (IRC). The investment tax credit provisions were liberalized effective January 1, 1981, by the Economic Recovery Tax Act of 1981 (ERTA). The ERTA provided to business a tax credit of 25 percent of the actual increase in research and development expenditures over a 3-year base period. Other provisions in the area of research and development provided by the ERTA include a corporate charitable deduction for used research and development equipment 2/ and more liberal research and development deductions allocated against U.S.-sourced income. 3/

The ERTA also amended the IRC to provide other tax incentives to spur new investment in production facilities, such as the accelerated-cost-recovery system (ACRS) and safe harbor leasing rules, which allow firms that are in financially precarious situations to sell their unused tax credits. However, since the ERTA's enactment in 1981, the U.S. Congress has put "new limits on the investment tax credit, repealing increases in ACRS benefits scheduled for 1985 and 1986, halving the benefits of safe-harbor leasing, and then abolishing it altogether as of January 1, 1984." 4/ The Tax Equity and Fiscal Responsibility Act of 1982 reduced by an estimated 57 percent the tax benefits of 1981 when the 1982 tax act effects are calculated out to 1986. 5/

In 1981, the latest year for which data are available, the ship-operating and shipbuilding industries had qualifying investments totaling $1.5 billion. Although the industries could have deducted as much as $150 million from their tax liabilities, only $73.5 million was actually claimed. Industry sources attribute this to little or no profits in the maritime industry and thus little tax liability to which to apply the credit. According to the Congressional Budget Office, the approximate annual cost of this tax credit is $150 million. 6/

1/ Main Hurdman/KMG, Profile of the Shipbuilding and Repairing Industry, Oct. 1, 1984, p. 15.

2/ 26 U.S.C.A. 170(e) (West 1978 and supp. 1983).

3/ 26 U.S.C.A. 861 (supp. 1983).

4/ Richard I. Kirkland Jr., "Taking the Business Lobby Loyalty," Fortune, Oct. 18, 1982, p. 144.

5/ Ibid.

6/ Congress of the United States, Congressional Budget Office, U.S. Shipping and Shipbuilding: Trends and Policy Choices, August 1984, pp. 62-64.

Additionally, there are a number of tax policies that indirectly benefit the domestic shipbuilding industry through encouragement of construction of new ships in U.S. shipyards. One of these is the Capital Construction Fund Program (CCF), which assists vessel operators in the U.S. foreign trade and non contiguous and Great Lakes domestic trade to accumulate the capital to build, acquire, and reconstruct vessels through deferral of Federal income taxes on eligible deposits. This program is authorized by section 607 of the Merchant Marine Act of 1936, and arose from amendments to the Act in 1970. It allows for the deferral of Federal income taxes on certain deposits of money or other property if these funds are used to construct vessels in U.S. shipyards. 1/ Since the program was initiated in 1971, fund holders have deposited $3.3 billion in CCF accounts, and withdrawn $2.4 billion through September 30, 1983, (the latest data available), for the expansion and modernization of the U.S. merchant fleet. 2/ According to industry sources, the vast majority of these projects were for vessels operating in the U.S. foreign trade. The Congressional Budget Office indicates that $270 million in Federal income taxes would have been collected in recent years if new deposits had not been made to this fund.

The Construction Reserve Fund Program (CRF), like the CCF, indirectly encourages building of commercial ships in U.S. shipyards by allowing eligible parties to defer Federal taxes on capital gains on the sale or other disposition of a vessel, provided the net proceeds are placed in a CRF and invested in a new (U.S.-built) vessel within 3 years. According to industry sources, the CRF is used predominately by owners of vessels operating in domestic coastal trade, and other trades not eligible for the CCF program. Maritime Administration data indicate that as of September 30, 1983, construction reserve funds totaled $11.8 million. 3/

Subsidies

The U.S. shipbuilding industry has historically been the recipient of a number of direct and indirect U.S. Government subsidies. The majority of these subsidies result from the Merchant Marine Acts of 1936 and 1970 (with subsequent amendments), which together establish a system of subsidies to assist the U.S. commercial shipbuilding industry so that this industry can be used to enhance national defense capabilities. The programs involved are discussed in detail below.

The Construction Differential Subsidy (CDS) provides for vessels used in foreign commerce to be built in the United States at parity with foreign yards. Under the CDS program, a U.S. shipyard or purchaser could apply to the Maritime Administration for a construction subsidy to aid in the construction or reconstruction of a vessel. The vessel, however, must be manned by U.S. citizen crews and remain in use for 20 to 25 years (depending on the type of vessel). The construction subsidy, however, cannot cover more than 50 percent

---

1/ National Advisory Committee on Oceans and Atmosphere, Marine Transportation in the United States: Constraints and Opportunities, January 1983, p. 20.

2/ U.S. Department of Transportation, Maritime Administration, MARAD '83, October 1984, p. 4.

3/ Ibid, p. 9.

of the domestic cost for competitive contracts. 1/ This program was further amended by a public law enacted July 31, 1976, which provides for a construction differential subsidy of up to 35 percent on negotiated contracts. During fiscal years 1963-83, approximately $3.8 billion was expended for this program. 2/ Table 17 shows construction and reconstruction subsidy outlays under this program during the lifetime of the CDS. The last vessel built under the Federal CDS program was delivered on January 24, 1984. The Construction Differential Subsidy program, however, has not been funded since September 30, 1982, as it was judged by the Department of Transportaton to be ineffective in promoting the building of commercial ships in U.S. shipyards. The expenditures shown for 1983 represent program approvals prior to the elimination of CDS funding.

Table 17.--Maritime construction differential subsidy and reconstruction subsidy expenditures, by types, fiscal years 1936-83

(In thousands of dollars)

Fiscal year(s)	Construction differential subsidy	Reconstruction subsidy	Total
1936-1955	248,321	3,287	251,608
1956-1960	129,806	34,881	164,687
1961-1965	486,639	11,261	497,900
1966-1970	413,073	25,381	438,454
1971-1975	810,727	90,329	901,056
1976	233,826	9,886	243,712
1977	203,480	15,052	218,532
1978	148,691	7,319	156,010
1979	198,518	2,258	200,776
1980	262,727	2,353	265,080
1981	196,446	11,667	208,113
1982	140,775	43,711	184,486
1983	76,941	7,520	84,461
Total	3,549,970	264,905	3,814,875

Source: U.S. Department of Transportation, Maritime Administration, MARAD '83, October 1984, p. 53.

1/ In some cases, however, the subsidy percentage actually exceeded 50 percent. Congressional approval was necessary for these exceptions. National Advisory Committee on Oceans and Atmosphere, Marine Transportation in the United States: Constraints and Opportunities, January 1983, p. 20.

2/ U.S. Department of Transportation, Maritime Administration, MARAD '83, October 1984, p. 53.

There are also several indirect subsidy programs that benefit the domestic shipbuilding industry. One of these, the Federal Ship Financing Program, was established pursuant to Title XI of the Merchant Marine Act of 1936, as amended. This program provides for a credit guarantee by the U.S. Government on debt obligations of U.S. citizen shipowners for purposes of financing or refinancing the purchase of U.S.-flag vessels constructed or reconstructed in domestic shipyards. Vessels eligible for this assistance generally include those designed principally for commercial or research use. The primary purpose of the program is to promote the growth and modernization of the U.S. merchant marine by assisting operators in obtaining private rather than direct Federal financing to build ships in American shipyards. Under Title XI, payment of the principal and interest on approved loans is guaranteed by the Federal Government. The program is administered by the U.S. Department of Commerce with guarantees of 87.5 percent of actual costs for unsubsidized ships and 75 percent for ships benefiting from construction differential subsidies. The current limit on these loan guarantees is $12 million, and the maximum guarantee loan period is 25 years. 1/

In general, vessels built with the aid of Title XI guarantees are subject to the "Buy American" requirements. However, a shipowner may be permitted to use foreign-built components under certain circumstances. If foreign components are used, however, the cost of this equipment is excluded from the amount of the loan guarantee. As of September 30, 1982 (the latest period for which data are available), Title XI guarantees in force totaled $8.1 billion.

Another technique for indirectly subsidizing the U.S. shipbuilding industry is the operating differential subsidy (ODS). This subsidy is generally available to U.S.-flag shipping companies for the operation of U.S.-built and manned ships that are engaged in international trade. Administered by the Maritime Administration, this program is designed to offset the lower ship operating costs of foreign flag competitors. Industry sources indicate, however, that this program has not been successful in generating any new construction in U.S. shipyards. Total operating subsidy expenditures paid to U.S. shipowners during the period January 1937-September 1983 (the latest data available) totaled $6.9 billion. 2/ The approximate annual cost of this program in 1984 is estimated by the Congressional Budget Office to be $380 million. 3/

A provision of the Omnibus Budget Reconciliation Act of 1981 amended the Merchant Marine Act of 1970 to authorize operators receiving or applying for ODS to construct, reconstruct, or acquire vessels in foreign shipyards under specific circumstances. An operator was required to receive written certification from the Secretary of the U.S. Department of Transportation that its CDS application could not be approved due to the unavailability of CDS funds. During fiscal year 1982, permission was granted to 18 companies to

---

1/ U.S. Department of Commerce, Maritime Administration, Federal Ship Financing Program, May 1981, pp. 1-5.

2/ U.S. Department of Transportation, Maritime Administration, MARAD '83, October 1984, p. 53.

3/ Congress of the United States, Congressional Budget Office, U.S. Shipping and Shipbuilding: Trends and Policy Choices, August 1984, p. 62.

construct, reconstruct, or acquire vessels in foreign shipyards. This temporary legislation expired September 30, 1982. However, 10 U.S.-flag operators took advantage of this exemption and built or are building 34 new ships and reconstructing 13 vessels in foreign shipyards. 1/

Financing

The Export-Import Bank (Eximbank) of the United States provides direct loans, loan guarantees, and loan insurance to public or private foreign buyers to finance U.S. exports. This financing has been used to a very limited extent in commercial shipbuilding because of the lack of foreign demand for commercial ships. Table 18 illustrates Eximbank support for the commercial shipbuilding industry during 1979-84. Only $3.9 million in loan insurance, and $15.7 million in direct loans were dispersed by the Eximbank during this period (table 18).

Table 18.--Eximbank support for U.S. exports of the commercial shipbuilding industry, by types of programs, 1979-84

Program	Number of loans	U.S. export contract value	Bank authorization amount	Disbursed amount 1/
		Million dollars		
Direct loan	2	32.5	16.1	15.7
Medium-term insurance	3	5.7	4.4	3.8
Total	5	38.2	20.5	19.5

1/ As of Dec. 31, 1984.

Source: Export-Import Bank of the United States.

Export promotion

Like other major industrialized nations, the United States offers a variety of export promotion programs to assist U.S. businesses in selling their products abroad. In this regard, the U.S. Department of Commerce, International Trade Administration, sponsors overseas commercial exhibitions of domestic products and conducts trade missions and sales seminars. The agency also collects and publishes information on new business opportunities abroad and assists U.S. firms in competing for major foreign projects. 2/

1/ U.S. Department of Commerce, U.S. Industrial Outlook 1985.

2/ U.S. Department of Commerce, International Trade Administration, Serving American Business, April 1983, p. 2. These export promotional activities are available not only for the U.S. commercial shipbuilding industry, but are provided to any domestic firm interested in exporting their products or services.

Officials of the U.S. Department of Commerce indicate that U.S. shipbuilders have not been interested in export promotion activities because their vessels cannot meet the world price for commercial ships. The U.S.-Government promotional activities in the maritime industry basically involve smaller fishing vessels (shrimp, tuna, and lobster boats) and capital equipment for commercial vessels. 1/

Other policies and assistance

The U.S. shipbuilding industry benefits from a variety of other Government programs. These include assistance available to all domestic industries, such as trade adjustment assistance, and industry specific activities such as cabotage and cargo preference laws.

Trade Adjustment Assistance for employees and firms is authorized by Title II, Chapter 3 of the Trade Act of 1974. The Trade Adjustment Assistance Program (TAA) assists employees in situations where increased imports of foreign-made products have contributed importantly to their loss of a job. To assure that the benefits go to such workers, the law requires the U.S. Department of Labor (DOL) to determine whether imports contributed importantly to job reductions in a particular company or subdivision of a company. DOL makes this determination in response to petitions from workers who have been laid off or threatened with layoffs. If the DOL decides that imports were an important factor, it certifies the affected workers in that firm as having group eligibility for adjustment assistance.

The TAA provides cash benefits called "trade readjustment allowances" (TRA), training, job search and relocation allowances, and other employability services. Workers eligible for TAA may receive the following benefits: (1) special help in finding a new job; (2) training in a new skill if suitable employment is not otherwise available (when the training facility is beyond normal commuting distance, transportation and subsistence expenses may be paid); (3) job search allowance to cover expenses for looking for work outside of commuting range (workers may be paid 90 percent of their necessary transportation and subsistence costs up to a maximum of $600); (4) relocation allowance to help workers move their families and household goods to their new area of employment, plus a lump-sum payment not to exceed $600 to help them get settled (workers may be paid 90 percent of their moving expenses); and (5) trade readjustment allowances, generally at the level of unemployment insurance benefits, that become payable when workers have exhausted their entitlement to unemployment insurance, including extended benefits. The combination of unemployment insurance, extended benefits, Federal supplemental compensation, and TRA cannot exceed 52 times the TRA weekly benefit amount, except that up to 26 additional weeks may be paid to workers in approved training. 2/

1/ Interviews with officials of the U.S. Department of Commerce, International Trade Administration, Office of Major Projects.

2/ Telephone interview with officials of the U.S. Department of Labor, Trade Adjustment Assistance Program.

During 1979-84, there were 27 investigations conducted by the U.S. Department of Labor in response to petitions by workers for trade adjustment assistance. Of these cases, 7 were certified (affecting 4,076 workers), 19 were denied (affecting 11,197 workers), and 2 were terminated by the petitioners (affecting 800 workers). 1/

The Trade Adjustment Assistance Program also authorizes financial assistance for certified firms in the form of direct and guaranteed loans to enable the firms to implement their adjustment proposals. This program is administered by the Department of Commerce (DOC). In addition to the financial assistance, this program provides technical assistance to firms, including: (1) guidance and preparation of certification petitions; (2) general diagnosis of a firm's problems and its opportunities for recovery; (3) assistance in preparing loan applications and adjustment proposals; (4) examination of specific problems recognized by a firm's management; and (5) in-depth assistance to firms in carrying out their adjustment proposals. 2/ This program provides technical assistance to a variety of trade-impacted industries to help them deal on an industry-wide basis with problems and opportunities concerning marketing, management, export promotion, production operation, and technological innovations. Since January 1, 1979, the U.S. Department of Commerce has conducted only one investigation in response to a petition for firm adjustment for a commercial shipbuilder. The firm, which filed its petition in 1984, was denied assistance on the basis that commercial ships are not an "article of international trade." 3/

The Ship Trade-In Program, provided for under section 510 of the Merchant Marine Act of 1936, authorizes the Maritime Administration to acquire privately owned vessels for the National Defense Reserve Fleet in exchange for an allowance payable to the shipowner or shipbuilder on the construction of new vessels. 4/ This program, however, has not been funded since October 1, 1982.

Another program similar to the Ship Trade-In Program is the Ship-Exchange Program. This program provides for the exchange of U.S.-built or U.S.-flag ships for obsolete ships in the National Defense Reserve Fleet. These obsolete ships are then normally sold abroad for their scrap value. U.S. citizen shipowners who are qualified ship operators are eligible to take advantage of this program. 5/

1/ Ibid.

2/ U.S. Department of Commerce, International Trade Administration, Report on Adjustment Assistance of Calendar Year 1982, Sept. 21, 1983.

3/ Telephone interview with officials of the U.S. Department of Commerce, Trade Adjustment Assistance Program.

4/ U.S. Department of Transportation; Maritime Administration, Maritime Subsidies, 1983, p. 161.

5/ Congress of the United States, Congressional Budget Office, U.S. Shipping and Shipbuilding: Trends and Policy Choices, August 1984, p. 63.

The United States has enacted several cargo preference laws that concern the involvement of Government-financed cargo that indirectly benefit the U.S. shipbuilding industry. There are three principal laws involved: the Military Transportation Act of 1904; Public Resolution 17 of the 73rd Congress; and the Cargo Preference Act (Public Law 83-664). The Military Transportation Act of 1904, administered by the U.S. Department of Defense, requires that all items procured or owned by the U.S. armed forces must be carried on U.S.-flag vessels. Public Resolution 17 requires that 100 percent of any cargos generated by loans made by the U.S. Government must be shipped on U.S.-flag ships. This provision principally concerns commodities financed by Export-Import Bank loans, unless a waiver is granted. However, there is a provision for waiver of the law by the U.S. Maritime Administration so that 5 percent of such shipments may be carried on the flag vessels of the recipient nation. The Cargo Preference Act (Public Law 83-664) requires that at least half of all U.S. Government-generated cargo be transported on privately owned U.S.-flag commercial ships. This provision applies to any cargo shipped under Federal Government grant or subsidized loan. 1/ Industry sources contend, however, that adherence to the Cargo Preference Act is not strictly enforced. 2/ The above-mentioned legislation, however, does provide indirect assistance to the domestic shipbuilding industry because U.S.-flag ships must normally be constructed in the United States. In 1982 (the latest year for which data are available), revenue from government-impelled cargo preference totaled $618.9 million for U.S. flag-ship operators. 3/

There is also a U.S. Government regulation regarding the repair of U.S.-flag ships that directly benefits domestic shipyards that offer repair services for commercial vessels. Section 466 of the Tariff Act of 1930, as amended, states that a duty of 50 percent ad valorem is applicable on the cost of equipment purchased or repairs made abroad for merchant vessels of the United States. 4/ According to the Congressional Budget Office, approximately $10 million is paid annually by U.S.-flag-ship operators as penalties for having their ships repaired outside the United States.

Section 27 of the Merchant Marine Act of 1920, commonly referred to as the Jones Act, requires that all coastal, intercoastal, and noncontiguous domestic trade be carried out by vessels that are built in the United States, are under U.S. registry, and are manned by U.S. citizens. This requirement has been of considerable benefit to the domestic shipbuilding industry. According to respondents to Commission questionnaires, the vast majority of commercial vessels constructed in domestic shipyards during 1979-84 were for Jones Act trade.

1/ U.S. Congress of the United States, Office of Technology Assessment, An Assessment of Marine Trade and Technology, October 1983, pp. 182-183.

2/ According to information obtained in a telephone conversation with the Office of the Secretary of the U.S. Department of Agriculture and a National Commission on Agricultural Trade and Export Policy staff member, the U.S. Department of Agriculture (USDA) is in favor of exempting their blended credit program and, possibly all USDA export programs, from cargo preference requirements.

3/ U.S. Department of Transportation, Maritime Administration, MARAD '83, October 1983, pp. 26-27.

4/ U.S. International Trade Commission, Tariff Schedules of the United States Annotated 1985, 1984, p. 945.

There are also, however, a number of U.S. Government policies and regulations that hinder the U.S. shipbuilding industry's international competitiveness. These include environmental, health and safety regulations, the Longshoreman's Compensation Act, and U.S. Coast Guard regulations.

According to industry sources, the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) has numerous regulations that affect shipyards in the areas of worker safety and health, noise, metal fumes and dust, and other emissions. Also, the industry must comply with environmental regulations regarding air and water pollution imposed by the U.S. Environmental Protection Agency (EPA). U.S. shipyards are also subject to numerous State regulations, which, according to industry officials, may even exceed Federal standards. A majority of the U.S. shipbuilding and ship repairing firms that responded to the Commission's questionnaire cited Government safety regulations as adversely affecting the competitive position of the U.S. industry. Only a few respondents complained of the necessity of such regulations or their enforcement. U.S. shipyards, however, view such requirements as hindering their competitiveness because foreign shipbuilders generally do not have to adhere to these types of regulations or bear their associated costs.

Another legislative provision of concern to the U.S. shipbuilding industry is the Longshoreman's and Harbor Worker's Compensation Act, which amends legislation establishing a Federally managed workmen's compensation fund for shipyard employees. This law requires shipyard operators to pay premiums that, according to the Shipbuilding Council of America, amount to as much as $20 to $84 for every $100 paid to employees in wages. 1/

The U.S. Coast Guard also has specific safety requirements associated with their approval of vessels for U.S.-flag operations. Some of the regulations require duplication of functions and restrictions on the choice of suppliers of certain commercial ship components. According to a study by the Office of Technology Assessment completed in 1983, compliance with U.S. Coast Guard regulations has been shown to add approximately 3 to 4 percent to the cost of a new commercial vessel.

U.S. Government regulations, such as those outlined in the preceding sections, are perceived by the domestic shipbuilding industry to place them in a competitive disadvantage with many of their foreign competitors. Foreign industries, for the most part, are comparatively less encumbered by these types of regulations, and U.S. shipbuilders and ship repairers have voiced complaints about the increasing financial burden of meeting domestic regulatory requirements. According to a study by the Shipbuilders Council of America in October 1978 (the latest period that such data are available) requirements, regulations and standards imposed by Congressionally enacted statutes or administrative edicts, necessitate an average of 11 to 16 percent in additional shipyard costs on a value-added basis. 2/

1/ Main Hurdman/KMG, Profile of the Shipbuilding and Repairing Industry, Oct. 1, 1984, pp. 15-16.

2/ Shipbuilders Council of America, Study of Cost of Federal Government Regulations on Shipbuilding Prices, October 1978, pp. 3-4.

World Industry and World Market

Shipbuilding has traditionally occupied an important position in the economy of many nations. The industry provides employment for a large number of skilled and unskilled workers and fosters the development and utilization of a variety of supporting industries such as steel, electronics, and machinery. Shipbuilding and ship repairing also has the potential to bring in revenue from foreign purchasers of commercial ships and repair services. For these reasons, the governments of many foreign nations have supported their maritime industries with a variety of methods ranging from cargo-preference laws to direct subsidization. 1/

However, even with the covert and overt government assistance to encourage new construction of commercial ships, the demand for these vessels has declined significantly in recent years. In general, the worldwide demand for commercial ships and ship-repair services is largely dependent on the demand for shipping services, which is dependent upon the volume of international trade, the distances over which this volume of trade is transported, and political events. The economic uncertainty regarding the cost of fuel during 1979-84 also has affected the demand for commercial ships.

Currently, world shipping is in a major slump. Industry sources indicate that much of the tanker fleet is in surplus because of the decline in shipments of petroleum. A large portion of the dry-bulk-ship fleet worldwide is also in excess supply. The oversupply has caused declines in world production, new orders, and repairs of commercial vessels.

In the recent past, production of commercial ships has shifted from developed countries in Europe to developed and developing nations in Asia. Industry sources indicate that the shipyards of Japan, Korea, Taiwan, and China capture almost 75 percent of the world market annually. Table 19 shows the percentage of new orders for commercial ships exceeding 100 gross tons, placed during 1979-83 (the latest period for which data are available). Although the scope of these data exceeds the scope of this study (which concerns commercial ships exceeding 1,000 gross tons), it illustrates the shift in the placement of vessel orders in the world market.

1/ U.S. Department of Transportation, Maritime Administration, Office of Shipbuilding Costs, An Analysis of Why the American Shipbuilding Industry Cannot Compete Internationally, July 1977, p. 18.

Table 19.--Share of new orders for commercial ships exceeding 100 gross tons, by selected regions, 1979-83

(In percent)

Year	Japan	Republic of Korea	Western Europe	All other
1979	49.47	6.20	27.43	16.90
1980	52.66	8.96	24.39	13.99
1981	48.00	8.08	25.33	18.59
1982	49.75	9.57	21.24	19.44
1983	57.40	19.00	11.60	12.00

Source: "World Shipbuilding," Maritime Reporter and Engineering News, June 1, 1984, p. 86.

The following regional profiles discuss the major commercial shipbuilding and repair centers in the world. Appendix C includes a detailed discussion of the major maritime nations and, to the extent the data are available, the policies of their governments that influence commercial shipbuilding and ship repair.

Far East

Important shipbuilding nations of the Far East include Japan 1/, South Korea 2/, China 3/, Taiwan 4/, Singapore 5/, and Australia. 6/ In 1983, shipbuilding production totaled approximately 9 million grt in these five countries. There were 335,300 workers employed in the shipbuilding and ship-repair industries of the Far East during this same year. These shipyards produce the lowest cost vessels of any region in the world, in part because of low labor costs, which are about one-fifth of those in the United States. Another factor that has contributed to the competitiveness of Far Eastern yards is government direction of the industry through mergers and assistance in the form of subsidies to shipyards. Also, favorable financing packages and tax treatment for both shipbuilders and ship purchasers are provided by many of the respective governments.

European Community

The principal shipbuilding nations of the European Community (EC) include Denmark 7/, France 8/, West Germany 9/, Italy 10/, the Netherlands 11/, and

1/ Detailed country analysis can be found on page 75.
2/ Detailed country analysis can be found on page 96.
3/ Detailed country analysis can be found on page 108.
4/ Detailed country analysis can be found on page 111.
5/ Detailed country analysis can be found on page 118.
6/ Detailed country analysis can be found on page 122.
7/ Detailed country analysis can be found on page 124.
8/ Detailed country analysis can be found on page 129.
9/ Detailed country analysis can be found on page 133.
10/ Detailed country analysis can be found on page 137.
11/ Detailed country analysis can be found on page 139.

the United Kingdom. 1/ In 1983, shipyards in these countries employed an estimated 182,350 persons. Commercial shipbuilding activity totaled 2.4 million grt in these shipyards in the same year. However, industry sources indicate that this figure represents a significant decline from the level achieved in 1979, because shipbuilders in these nations are experiencing many of the same problems as the U.S. maritime industry. In addition to the individual member state's assistance to their domestic industries, the EC provides industry restructuring aid, subsidies, and financing assistance.

Other West European countries

The primary European shipbuilders and repairers that are not members of the European Community are Finland 2/, Sweden 3/, Norway 4/, and Spain. 5/ In 1983, with approximately 68,700 employees, shipyards in these countries produced an estimated 1.3 million grt of commercial ships. The government assistance provided to shipyards in the above mentioned nations included industry restructuring aid, direct subsidies, research and development financing, and export promotion.

Eastern Europe

The major shipbuilding countries of Eastern Europe are Poland 6/, Yugoslavia 7/, and the Soviet Union. 8/ Total shipbuilding production amounted to approximately 855,000 grt in 1983 for these three countries. Employment in the shipbuilding and ship-repair industries of Poland and Yugoslavia totaled 75,600 in 1983. 9/ The shipbuilding industries of Eastern Europe are state-owned and controlled. Production levels are basically determined by the Soviet Union's economic goals under its 5-year plans, and the majority of the shipyards' production and repair activities are for Soviet bloc countries.

Competitive Position of the U.S. Commercial Shipbuilding and Ship Repairing Industries in the World Market

In terms of competitive advantage, the United States was compared with Japan, South Korea, China, Taiwan, Singapore, Denmark, Finland, West Germany, France, the United Kingdom, Spain, Italy, Poland, the U.S.S.R., and Brazil (table 20). 10/ In general, U.S. shipbuilders and ship-repair firms indicated that they are at a competitive disadvantage with respect to the majority of producers in these countries.

1/ Detailed country analysis can be found on page 141.
2/ Detailed country analysis can be found on page 151.
3/ Detailed country analysis can be found on page 154.
4/ Detailed country analysis can be found on page 157.
5/ Detailed country analysis can be found on page 159.
6/ Detailed country analysis can be found on page 163.
7/ Detailed country analysis can be found on page 165.
8/ Detailed country analysis can be found on page 166.
9/ Data for the Soviet Union are not available.
10/ Other foreign industries cited by respondents, but containing insufficient data with which to present comparisons include the Netherlands, Sweden, Norway, Yugoslavia, and Canada.

Price

According to data obtained from interviews with both the U.S. shipbuilding and ship-operating industries, domestically built commercial vessels cannot compete in the world market because of their higher price. In general, it costs between 2 and 3 times as much to build a merchant ship in the United States as it does to construct the same ship in a foreign shipyard. 1/ Respondents to the Commissions questionnaire confirmed that foreign shipyards have a significant competitive price advantage in ship repairing as well. These higher prices for both shipbuilding and repairing are due primarily to higher material and labor costs in the United States and to longer U.S. construction time.

Raw and semifinished materials

Steel, in the form of plates, structural shapes, and castings is the principal semifinished material consumed in the construction of commercial ships. 2/ The type of steel used is determined by the type and desired quality of the portion of the ship being repaired or constructed. For material availability, U.S. shipyards assert that they are equally competitive with the foreign shipbuilders cited, with the exception of China and the U.S.S.R., which they felt had a competitive advantage in this area. Regarding the cost of the raw materials used in both shipbuilding and ship repairing, questionnaire respondents indicate that they are at a competitive disadvantage with all of the foreign shipyards. Industry sources attribute a portion of this noncompetitiveness to the fact that many foreign shipyards are owned by large conglomerates, which also own steel mills. Thus they argue that these shipyards benefit from the reduced costs gained by vertical integration.

Capital

Information solicited from U.S. producers indicates that the shipbuilding and ship-repairing industries in Japan, South Korea, China, Taiwan, Denmark, Finland, France, Spain, Italy, Poland, the U.S.S.R., and Brazil have the competitive advantage in the availability of capital. 3/ U.S. firms believed themselves to be equally competitive in this area with Singapore, West Germany, and the United Kingdom. In regard to the cost of such capital, all of the major competitors cited by the domestic industry were indicated to have a competitive advantage during 1979-84. Data regarding representative short-term money market rates (the rate at which short-term borrowings are effected between financial institutions) for the United States and certain competitors contradicts this argument in some instances. Data regarding longer term rates are cited by banking industry sources to generally be a few

---

1/ Submission of the Council of American Flag Ship Operations, Dec. 10, 1984, p. 2; and Submission of the Quincy Shipbuilding Division of General Dynamics Corporation, Dec. 14, 1984, p. 17.

2/ U.S. Department of Transportation, Maritime Administration, Relative Cost of Shipbuilding, October 1984, p. 13.

3/ Foreign government provision of preferential financing is discussed in the country profiles in Appendix C.

Table 20.—Commercial shipbuilding and ship repairing: U.S. producers' competitive assessment of structural factors of competition for selected foreign industries, 1979-84 1/

Item	Competitive advantage 2/														
	Japan	Republic of Korea	China	Taiwan	Singapore	Denmark	Finland	West Germany	France	United Kingdom	Spain	Italy	Poland	U.S.S.R.	Brazil
Price	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Raw materials:															
Availability	S	S	F	S	S	S	S	S	S	S	S	S	S	F	S
Cost	F	F	F	F	F	F	F	S	F	F	F	F	F	F	F
Capital:															
Availability	F	F	F	F	S	F	F	S	F	S	F	F	F	F	F
Cost	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Ability of industry to attract funds	F	F	S	F	S	S	F	S	S	S	F	F	F	F	F
Labor:															
Availability	F	F	F	F	S	S	S	S	S	S	S	S	F	F	S
Cost	F	F	F	F	F	S	F	S	F	F	F	F	F	F	F
Skill level	F	S	D	S	S	S	S	S	S	S	S	S	S	S	D
Quality	S	S	D	S	S	S	S	S	S	S	S	S	S	S	D
Level of technology	F	S	D	S	S	S	S	S	S	S	S	S	S	S	S
Government involvement:															
Subsidies	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Research and development	F	F	F	F	S	F	F	F	F	F	S	F	F	F	S
U.S. regulations that increase costs	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

1/ Other foreign industries cited by respondents but containing insufficient data to present include the Netherlands, Sweden, Norway, Yugoslavia, and Canada.

2/ D = domestic advantage; F = foreign advantage; and S = competitive position the same.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

percentage points below these figures (table 21). The overall cost of capital appears to be higher in the United States than in Japan, and West Germany, but less than Denmark, France, the United Kingdom, Spain, Italy, and Brazil. U.S.

Table 21.--Short-term money market rates for the United States and other specified markets, 1979-83

Country	1979	1980	1981	1982	1983
United States	11.20	13.36	16.38	12.26	9.09
Japan	5.86	10.93	7.44	6.94	6.39
Singapore	14.13	14.50	7.50	10.75	9.38
Denmark	12.63	16.93	14.84	16.36	12.03
West Germany	5.90	9.10	11.30	8.70	5.40
France	9.04	11.85	15.30	14.87	12.53
United Kingdom	17.00	14.00	2/ 14.80	2/ 12.95	2/ 11.40
Spain	10.80	18.60	18.70	20.30	16.40
Italy	11.86	17.17	19.60	20.18	18.47
Brazil	32.62	33.03	58.61	67.58	1/

1/ Not available.
2/ Estimated using International Monetary Fund data.

Source: International Monetary Fund, International Financial Statistics Yearbook, 1984.

shipyards also indicate that they are, for the most part, at a competitive disadvantage regarding the ability of industry profit to attract funds in comparison to the majority of their foreign competitors.

Labor

In general, U.S. shipbuilders and ship repairers perceive themselves to be equally competitive with foreign shipyards in the area of availability of labor. The only exceptions to this were Japan, South Korea, China, Taiwan, Poland, and the U.S.S.R., which were believed to have a larger supply of labor available for shipbuilding and repairing. However, as shown in the major foreign competitors' section of this report, wage rates are reported in general to be much lower than those earned in the United States. Questionnaire respondents indicate, however, that the cost of labor in Denmark, and West Germany is comparable to that in the United States. The skill level of shipyard workers in most foreign facilities was believed to be comparable with that found in the United States. Chinese and Brazilian workers were perceived to have a lower level of production skills, but Japan was cited as the only foreign industry whose employees were more highly skilled than American shipyard workers.

Quality and technology

The domestic shipbuilding industry is capable of building almost any type of merchant vessel in the world. 1/ According to data obtained from shipbuilders responding to the Commission's questionnaire and interviews with shipowners and industry consultants, U.S.-built ships are comparable in quality to those built in the most advanced foreign shipyards. The domestic industry has also been noted as being equally competitive with, and sometimes superior to, the majority of its foreign counterparts in performing both emergency repairs and routine ship maintenance.

According to questionnaire respondents, the United States is equally competitive in its level of shipbuilding and ship-repair technology with South Korea, Taiwan, Singapore, Denmark, Finland, West Germany, France, the United Kingdom, Spain, Italy, Poland, the U.S.S.R. and Brazil. 2/ Japan was believed to have a higher level of technology than the United States, while China was cited as having a lower level of technology.

However, various studies have found that the U.S. industry is less technologically advanced than many of its major competitors. Much of this low technology was found in management and systems oriented areas of U.S. shipbuilding. 3/ Some of the items specifically cited include ship construction and outfitting, layout and material handling, design and drafting, and working environment. U.S. shipowners have also expressed their view that U.S. ship technology, principally in the area of propulsion, does not match that available from foreign suppliers. 4/

Industry analysts assert that process lane construction 5/ and zone outfitting distinguish modern shipyards from more traditional ones. The establishment of process lanes is a common development among leading Japanese, Korean, and European shipyards. However, industry sources state only one American shipyard has established process lanes for vessel construction. This change has been estimated to have achieved almost a 20 percent reduction in hull-labor hours for this yard by employing this technology. Similarly, zone outfitting was estimated to result in a 30 percent time savings, compared with onboard outfitting. 6/ However, it is believed that only about one-half of U.S. shipyards are engaged in zone outfitting.

1/ Congress of the United States, Office of Technology Assessment, An Assessment of Maritime Trade and Technology, October 1983, p. 96.

2/ Foreign government involvement in shipbuilding research and development is discussed in the country profiles in Appendix C.

3/ Congress of the United States, Office of Technology Assessment, An Assessment of Maritime Trade and Technology, October 1983, p. 96.

4/ Submission of the Council of American-Flag Ship Operators, Dec. 10, 1984, p. 2.

5/ "A process lane is a series of fixed workstations provided with permanent services (pneumatic, electrical, welding, etc.) and appropriate tooling and jigs to produce a category of products (subassemblies) whose fabrication and assembly involve the application of a given sequence of production processes or which involves a common set of manufacturing problems," Bruce J. Weiers, Transportation Systems Center, U.S. Department of Transportation, The Productivity Problem in the United States Shipbuilding, 1984, p. 15.

6/ Ibid., pp. 15-24.

The U.S. shipbuilding industry is thought to lag behind many of its foreign competitors in layout and material handling. This deficiency is due, in part, to the fact that the vast majority of U.S. shipbuilding and ship-repairing facilities are over 50-years old, which often constrains efficient assembly handling and manipulation of components. Some of the larger U.S. yards have attempted to improve their material handling capabilities by investing in large erection cranes.

Many foreign shipyards, unlike much of the U.S. industry, build commercial ships from their own designs, rather than using outside drafting services. In-house designing is believed to permit more efficient fabrication, assembly, and outfitting because the planners are intimately aware of the specific characteristics and capabilities of the shipyard. 1/

The U.S. maritime industry lags in environmental and amenities technology when compared with its foreign counterparts. This generally includes the working conditions and services provided to shipyard employees, which can affect productivity. Productivity has been cited as being substantially lower in the United States than in many foreign yards. In fact, a comparison of American and foreign yards done in the early 1980's shows that labor productivity in U.S. shipbuilding and repair yards is almost half of that in Japanese and Scandinavian ones. Of this figure, approximately one-third of the difference is attributed to "superior organization and systems, and more effective workforce in foreign yards." 2/

However, because the United States builds so few commercial vessels, designs of vessels are rarely standardized. Because of this, the domestic industry has great expertise in the area of custom ship work and in integrating highly technical systems with conventional ones. These skills are more commonly used with U.S. Navy vessel construction, but they have helped commercial shipbuilders gain a competitive advantage in developing and producing vessels used in many specialized fields. 3/ Some vessel types include liquified natural-gas carriers, large commercial fishing vessels, and offshore-support ships.

1/ Congress of the United States, Office of Technology Assessment, An Assessment of Maritime Trade and Technology, October 1983, p. 96.

2/ U.S. Department of Transportation, Maritime Administration, in cooperation with the University of Michigan, Social Technologies in Shipbuilding-Workship Proceedings, May 1983, p. 11.; Ray Ramsay, "A Time for Shipbuilding Renaissance," Naval Engineers Journal, September 1983; and Bruce J. Weiers, Transportation Systems Center, U.S. Department of Transportation, The Productivity Problem in United States Shipbuilding, 1984, p. 15.

3/ Submission of the Quincy Shipbuilding Division of General Dynamics Corporation, Dec. 14, 1984, p. 25, and verified through contacts with U.S. industry sources and consultants.

Delivery time

Commercial ships are revenue generating capital equipment for their owners. For this reason, delivery time is often a critical factor in the competitiveness of world shipbuilders. It is generally accepted in the Maritime community that it takes substantially longer to build a new commercial ship in the United States than in the vast majority of foreign shipyards. Using ship flowrates (the ratio of deliveries to ships under construction) the Office of Technology Assessment found that the flowrates in the United States have historically been about 50 percent that of European shipyards and less than 33 percent that of Japanese yards. 1/ In terms of manhours, maritime industry sources assert that domestic shipyards require almost three times as much labor input as many comparable foreign industries. 2/ Therefore, the time to complete a commercial vessel in a modern foreign shipyard from laying the keel to final delivery could be 10-12 months; in the United States the necessery time for completion could extend to 2 years.

The time to complete a commercial ship is also very important because of its impact on costs, because of the opportunity cost of the facilities occupied during the construction period and the inventory cost of materials and work in progress. 3/ The additional cost time for U.S.-built ships has been estimated to be 5 percent of the final cost of a commercial vessel. 4/

The few domestic shipbuilders that have initiated modern ship-construction techniques and process-lane production have been able to reduce the length of their shipbuilding cycle by as much as 40-50 percent. These firms assert that while they have the capability to construct merchant vessels in about the same time as foreign producers, the factor which limits their acheiving the same efficiency as their foreign counterparts is the long lead time necessary for acquisition of many major components. Because of the decline in the U.S. maritime industry in recent years, many of the companies that manufacture commercial ship components have withdrawn from the market. Consequently, many of the necessary supplies are difficult to obtain, or when obtainable, require lengthy delivery periods. Alternatively, as shown earlier in this report, purchase of foreign components is necessary. These purchases also lengthen the shipbuilding cycle for U.S. builders.

The instability of the shipbuilding industry also plays a part in the lengthy building period required for U.S. construction of many merchant vessels. The cyclical nature of shipbuilding typically necessitates large fluctuations in employment and, as stated earlier in this report, training or retraining shipyard workers can often be a time-consuming process. These time delays are then absorbed into the U.S. shipbuilding cycle, further lengthening it.

1/ Congress of the United States, Office of Technology Assessment, An Assessment of Maritime Trade and Technology, October 1983, p. 107.

2/ Committee on Navy Shipbuilding Technology, National Research Council, Productivity Improvements in the U.S. Naval Shipbuilding, 1982, p. 16.

3/ Bruce J. Weiers, U.S. Department of Transportation, Transportation Systems Center, The Productivity Problem in United States Shipbuilding, 1984, p. 23.

4/ Op. cit., An Assessment of Maritime Trade and Technology, p. 107.

Another factor cited by domestic shipbuilders is frequent design changes requested by the shipowners during the actual construction period. Often there is a consistent flow of requested engineering changes, some of which involve significant design changes. Many of the successful foreign shipbuilders, according to U.S. industry sources, do not allow changes to be made by the purchaser of the merchant vessel until construction is actually complete, thus eliminating any major changes.

The United States has traditionally had a reputation for faster ship-repair turnaround. This is due, in part, to the fact that because the United States is involved in such a large portion of world oceanborne trade, the domestic industry has developed a skilled workforce, which has developed a great deal of expertise regarding both emergency repairs and ship maintenance. Industry analysts indicate that domestic shipyards are generally comparable with their foreign counterparts in terms of delivery time in commercial ship conversions and reconversions.

Government involvement

U.S. shipbuilders and ship-repair firms allege that foreign competitors have a competitive advantage in government subsidies that directly benefit their maritime industry. All of the shipbuilding and ship-repairing firms outside the United States were cited as benefiting from subsidies. Research and development assistance was cited as giving these countries, except Singapore, Italy, and Brazil, a competitive advantage over domestic shipyards. However, as discussed earlier in this report, the U.S. Government has provided research and development assistance, preferential tax policies, direct and indirect subsidies, export promotion and financing assistance, and other miscellaneous programs which benefit the domestic maritime industry.

U.S. Government regulations such as environmental and worker health and safety regulations were also perceived by questionnaire respondents to be a major competitive advantage of foreign shipyards. Foreign industries are believed to be comparatively less encumbered by these types of regulations. U.S. shipbuilders have voiced complaints about the increasing financial burden of meeting U.S. regulatory requirements, which industry representatives believe put the U.S. industry at a further competitive disadvantage.

The fluctuations of foreign exchange rates relative to the U.S. dollar have an important impact on the price shipowners must pay for their commercial vessels. According to maritime industry sources, a strong U.S. dollar has added as much as 30 percent to the cost of U.S. vessels since 1979.

U.S. shipyards' responses to foreign competition

In response to increased foreign competition for commercial ships in domestic and foreign markets, U.S. shipyards indicated that they have shifted to Navy repair or construction when that business was available. In regard to production of LNG carriers and tankers, questionnaire respondents stated that they have relinquished that work in favor of other types of marine vessels. The shipyards also indicated that they have been forced to reduce planned expansions of capacity in their domestic facilities. These firms stated, however, that they have implemented numerous cost reduction efforts and improved the quality of their ships.

Ocean Freight Shipping

Shipping has traditionally been an international industry. Most nations that border international waters have established a national merchant marine to provide employment opportunities, transport their goods, support a shipbuilding base, serve national defense needs and provide a balance of payments source. 1/ Table 22 shows the major merchant fleets operating in the world in 1983 (the latest year for which data are available).

Table 22.--Major world merchant fleets, by countries, Jan. 1, 1983

Country	Tonnage	Number of ships
	1,000 deadweight tons	
Liberia	140,293	2,145
Greece	68,868	2,604
Japan	63,665	1,775
Panama	56,288	3,141
Norway	36,237	577
United Kingdom	32,067	816
U.S.S.R	22,457	2,482
United States (privately owned)	21,647	573
United States (U.S. Government owned)	2,756	259
France	17,422	318
Italy	15,747	605
Singapore	12,042	588
Spain	11,924	517
China	11,798	811
West Germany	10,381	439
India	9,826	385
Republic of Korea	9,552	474
Netherlands	7,645	454
All other	120,478	6,519
Total	671,093	25,482

Source: U.S. Department of Transportation, Maritime Administration, MARAD '83, p. 13.

According to the Congressional Budget Office, the United States has one of the largest merchant fleets in the world (in terms of total cargo capacity),

1/ Office of the U.S. Trade Representative, U.S. National Study on Trade in Services, December 1983, pp. 204-208; and The Relationship of Exports in Selected U.S. Service Industries to U.S. Merchandise Exports, Inv. No. 332-132, USITC Pub. No. 1290, September 1982, pp. 364-366.

if all ships owned by U.S. citizens (including those under foreign flag) were aggregated. The privately owned U.S. merchant fleet totaled 573 vessels in 1983, but industry sources indicate that over 20 percent of these are currently inactive. A major portion of the U.S. fleet is registered abroad. There were approximately 602 ships, with cargo capacity of 57.1 million deadweight tons, registered under foreign flags in 1983. 1/ The three major countries for ship registration are Panama, Liberia, and Honduras.

U.S. trade

Total U.S. oceangoing foreign trade fell from 823 million tons in 1979 to 630 million tons in 1983 (the latest year for which data are available), or by 23 percent (table 23). The value of trade, fluctuated over the 5-year period, rising a net 10 percent to $267.4 billion by 1983. The percentage of this trade carried by U.S. flag ships rose, in tonnage, from 4.3 percent in 1979 to 5.8 percent in 1983. By value this share increased from 14.7 percent in 1979 to 16.1 percent in 1983.

Table 23.--U.S. oceanborne foreign trade, by flag carrier, 1979-83

Item	1979	1980	1981	1982	1983
	Thousand tons				
U.S. flag	35,020	28,199	34,177	31,115	36,662
Other flags	788,078	744,045	725,822	644,430	593,750
Total	823,098	772,244	759,999	675,545	630,412
	Million dollars				
U.S. flag	35,689	42,345	46,950	43,507	43,045
Other flags	206,428	251,949	268,436	237,657	224,356
Total	242,117	294,294	315,386	281,164	267,401

Source: U.S. Department of Transportation, Maritime Administration, December 1984.

U.S. oceanborne trade transported by foreign-flag vessels decreased in tonnage from 788 million tons in 1979 to 594 million tons in 1983 but increased in value from $206.4 billion to $224.4 billion in the same period. The leading foreign-flag carriers and the percentage of U.S. oceanborne trade they transported (in tonnage terms) are shown in table 24 for 1979 and 1983.

1/ Congress of the United States, Congressional Budget Office, U.S. Shipping and Shipbuilding: Trends and Policy Choices, August 1984, p. 23.

Table 24.--U.S. oceanborne foreign trade, by leading flags of foreign registry, 1979 and 1983

(In percent)

Flag of vessel	1979	1983
Liberia	31.7	28.1
Panama	7.5	10.8
Greece	13.3	10.3
United Kingdom	6.0	5.5
Japan	4.2	5.4
Norway	4.8	5.3
Singapore	3.5	2.8
Canada	2.6	2.4
Republic of Korea	1.0	1.7
Italy	1.9	1.7
Denmark	1.1	1.4
West Germany	1.9	1.2
Belgium	.6	1.1
Spain	1.0	1.0
Netherlands	1.3	.9
India	.8	.9
Brazil	.5	.8
France	1.4	.7
Philippines	1/	.7
Yugoslavia	.7	.7
Bahamas	1/	.6
Sweden	.8	.6
People's Republic of China	-	.5
Taiwan	1/	.5
U.S.S.R	.9	1/
All other	8.2	8.6
Total	95.7	94.2

1/ Not available; data included in all other foreign flags total.

Source: Telephone conversation with officials of the U.S. Department of Transportation, Maritime Administration, December 1984.

Recent Initiatives On Behalf Of The U.S. Shipbuilding and Ship-Repairing Industries

The U.S. Government currently provides a wide range of assistance programs to the domestic maritime industry as reviewed earlier in this report. However, industry analysts assert that the United States does not have a comprehensive maritime policy that deals effectively and equitably with the shipping and shipbuilding sectors, while also adequately addressing the need for maintaining national defense capabilities. In this regard, numerous proposals for maintaining the domestic shipbuilding and ship repairing industries have been presented. The following sections examine some of the current initiatives and alternate strategies proposed by various U.S.

Government agencies. Additionally, several proposed legislative initiatives to assist the industry's efforts in becoming more competitive in world markets are discussed.

Office of Technology Assessment

The Congressional Office of Technology Assessment in a recent study (published in October 1983) stated that current maritime policies of the United States are outdated and inadequate in light of the problems faced by the domestic industry today. The agency stated that major new Federal policies are necessary to ensure the health of the domestic shipbuilding and repair industries for both commercial and national defense reasons. In fact, the report advised that "the future viability of U.S. commercial shipbuilding will depend on some form of Federal support." 1/ In this regard, the Office of Technology suggests the following Congressional actions:

- eliminate the conflicting policies of the major government agencies involved in the maritime sector;
- consider tax incentive schemes to stimulate investment in capital equipment for U.S. shipyards to promote modernization and improve productivity in the industry;
- assist the domestic industry in its research and development efforts by formulating R & D incentives and stimulating cooperation and transfer of technology within the industry and from military and foreign sources;
- revitalize federal loan guarantee and financing assistance programs; and
- devise new federal subsidy programs for the industry in recognition of the fact that these firms must compete directly with subsidized foreign industries.

If these options are not pursued, the Office of Technology Assessment asserts that Congress should phase out maritime subsidy programs and the Federal requirements associated with these programs and allow the industry to compete in the world market without any Federal Government intervention. However, the agency states that it is important for Congress to define the necessary shipbuilding base through Government or defense expenditures if the commercial market does not sustain it.

National Advisory Committee on Oceans and Atmosphere

The National Advisory Committee on Oceans and Atmosphere (NACOA), in a draft of a study conducted in 1984-85, assessed the impact of U.S. Government

1/ Congress of the United States, Office of Technology Assessment, An Assessment of Maritime Trade and Technology, October 1983, p. 10.

involvement on both the commercial and military shipbuilding and repair sectors of the United States. 1/ One of the rationales frequently used for supporting the U.S. commercial maritime industries is their importance for the nation's national defense. In this preliminary report NACOA found, however, that the build-U.S. requirements of many of the current maritime laws (enacted in order to preserve the shipbuilding base for national defense reasons) have imposed increased costs on domestic ship operators. Also, the NACOA draft study stated that the Government subsidy programs failed to create commercial shipbuilding activity in domestic shipyards. One of the study's initial conclusions is that U.S. Government efforts should concentrate on increasing Federal and commercial fleets, since wartime sealift requirements depend more on the sufficiency of U.S.-owned, -flag, or -controlled shipping, rather than shipbuilding or repair capacity. The preliminary NACOA report asserts that considering the number of recent U.S. shipyard closings (shown earlier in this study), the United States still has a large enough ship construction and repair capability to meet its commercial and national defense requirements.

Maritime Redevelopment Bank Charter Act of 1985

The Maritime Redevelopment Bank Charter Act of 1985 (H.R. 33) was introduced in the 99th Congress, 1st session, House of Representatives on January 3, 1985 by Congressman Mario Biaggi for himself, and members Anderson, Boggs, Mikulski, and Foglietta. A copy of the legislation is presented in appendix D. At the present time, this bill has been referred to the House Committee on Merchant Marine and Fisheries. The legislation was initially proposed in Congress on June 23, 1983 as the Maritime Redevelopment Bank Act of 1983 (H.R. 3399). 2/ The bill was then referred to the House Committee on Merchant Marine and Fisheries. Field hearings on the bill were held on January 18, 1984, in New Orleans, Louisiana, and on April 30, 1984, in New York City, New York. The Merchant Marine Subcommittee conducted hearings on the matter in Washington, DC on June 20, 1984, and August 8, 1984. The purpose of the current proposal, as stated in the legislation, is "to stimulate innovation, increase productivity, and improve the competitiveness of the maritime industry in the United States."

This legislation seeks to establish a privately capitalized, Government-sponsored enterprise to be known as the Maritime Redevelopment Bank of the United States. Initially, however, the Bank will be structured as a closely held, mixed ownership (private and Federal Government) incorporated entity. The Bank will be governed by a Board of Directors made up of both public officials and private citizens; the number of each will be based on the

---

1/ The conclusions and recommendations of the study are preliminary and are subject to approval by the full National Advisory Committee in approximately April 1985.

2/ The current legislation differs from the Maritime Redevelopment Bank Act of 1983 (H.R. 3399) in that it does not call for sealift mobility augmentation and shipbuilding capacity maintenance. This provision of the bill was absorbed into H.R. 3289, "a bill to establish a commission to study defense related aspects of the U.S. merchant marine." This legislation was then made part of H.R. 5167, "Department of Defense Authorization Act of 1985," which was enacted into law on Oct. 19, 1984 (Public Law 98-5-525).

proportional equity contribution of the U.S. Government to the Bank. The public members of the Bank's board of directors will be appointed by the President with the advice and consent of the U.S. Senate. The private members will be elected annually by the nonfederal stockholders of the Bank. The members of the Board must be U.S. citizens, and their term of office is 1 year or until their successors have been appointed and qualified. 1/

The Bank is to be initially capitalized by the following infusions of public funds:

- monies in the Capital Construction Fund;
- monies in the Federal Ship Financing Fund;
- excess monies received from the Ship Trade-in Program;
- monies received from the sale of obsolete vessels in the National Defense Reserve Fleet; and
- monies received as repayment for loans extended by the Bank and the fees associated with these loans.

The Board of Directors, at their discretion, may also issue common stock in the Bank. The Maritime Redevelopment Bank is intended to operate on a profit-making, self-sustaining basis. In this regard, one of the subsections of the legislation exempts the Bank from payment of State or local taxes.

The main purpose of the Bank is to finance the construction, reconstruction, or conversion of commercial ships. The Bank is also authorized to extend loan guarantees. The legislation states that the Bank must give priority to providing financial assistance to commercial projects involving updating and improving the technology and competitiveness of domestic shipbuilders. The Bank may also underwrite export, war, and political risk insurance in order to protect its outstanding investments.

The products eligible for Bank assistance include any vessel or industrial product manufactured in a commercial shipyard in the United States; any vessel produced under a license, joint-venture, or coproduction agreement between a domestic and foreign shipyard; and any vessel for operation under a joint-venture, consortium, or cooperative arrangement between a U.S. citizen

---

1/ In H.R. 3399, the legislation initially proposed that the Maritime Redevelopment Bank's governing organization would consist of nine directors, and would be chaired by the Secretary of Transportation. The vice-chairman was to be the Special Trade Representative and the remaining seven directors would be appointed by the President with the advice and consent of the U.S. Senate. At least one of the directors was to come from the ocean-shipping industry, one from the commercial shipbuilding industry, one from the vessel-financing community, one from international trade and transportation, and one representative of organized labor. The remaining members would be from the general public, because Government officials other than those specified above, were to be excluded from membership.

and another party for operation in U.S. foreign trade. The legislation states, however, that if the ship is built, reconstructed, or converted outside the United States, the vessel will not be eligible to receive operating differential subsidy.

Section 222 of the Maritime Redevelopment Bank Charter of 1985 authorizes the Bank to finance the construction, reconstruction, or modification of a commercial ship in a domestic shipyard for sale or lease for documentation under U.S. law. However, the Bank's exercise of this "build and charter" authority is limited. Furthermore, the legislation allows the Bank to establish a fund to finance the incorporation of defense features approved by the U.S. Department of Defense (on a cost-reimbursable basis) on commercial vessels constructed in both foreign and domestic shipyards for documentation under the laws of the United States. The vessels financed under this provision of the bill shall not be subject to the "buy national" requirements imposed under section 505 of the Merchant Marine Act of 1936, as long as the foreign nation supplying the component does not impose "buy national" requirements for its commercial vessels.

Additionally, the legislation establishes a privately financed, Government-sponsored corporation to be known as the National Shipbuilding Research and Development Corporation. The organization is supposed to stimulate private capital investment in commercial-shipbuilding research and development, utilizing tax-advantaged incentives for third-party financing of research and development. Like the Maritime Redevelopment Bank, this corporation is to be operated on a profit-making basis. The legislation states that the corporation is to be governed by a Board of Directors who are private citizens of the United States. Basically, the organization is to conduct research regarding the development of computer-integrated manufacturing technologies applicable to commercial vessels and industrial products produced in domestic shipyards and by component manufacturers. Also, it will undertake research aimed at improving overall maritime industry innovation, productivity, and competitiveness, along with worker retraining programs. The corporation is to finance its research and development activities through limited partnerships and joint ventures, patent interchange, royalties, licenses, and cross-license arrangements.

The National Shipbuilding Research and Development Corporation is also authorized to conduct market research in export development of commercial ships and industrial products. Additionally, the corporation may establish, or participate in the establishment of, export trading companies under the Export Trading Company Act of 1982 in order to attempt to increase the amount of foreign trade carried on U.S.-flag vessels.

In conclusion, the Maritime Redevelopment Bank Charter Act of 1985 seeks to improve the competitiveness of the U.S. shipbuilding industry by restructuring existing financing authority delegated to the Secretary of Transportation into two Government-sponsored corporations. Product diversification and technology transfers within the domestic industry are also to be implemented through provisions in the legislation.

As stated earlier in this report, commercial vessels are not considered articles of commerce under the Tariff Schedules of the United States Annotated;

therefore, import relief under countervailing duty, antidumping, and escape clause legislation, is not available to the industry. Congressional proponents of this bill visualize it as an alternative to import relief or bilateral/sectorial agreements with other major trading partners.

U.S. industry's perspective.-U.S. shipbuilders and ship repairing firms, in response to the Commission's questionnaire, indicated a definite need for Federal Government assistance for the maritime industries, but expressed concern about the viability of H.R. 33, The Maritime Redevelopment Bank Charter Act of 1985. 1/ The industry's primary concern centers on the fact that the legislation does not explore the financing aspect on a worldwide basis. They indicate that even the most advantageous financing scheme proposed under the bill cannot alter the fundamental competitive disadvantages of the domestic industry. Respondents stated that only if the actual costs of ship construction and repair are on a par with that of foreign builders will the financing offered help improve the U.S. industry's competitiveness in the world market for commercial ships. Additionally, since the legislation does not address the construction differential subsidy, cargo preference, or cargo stimulation issues, the industry feels that, at most, the bill will encourage construction of ships to be used in domestic (i.e., Jones Act) commerce, and therefore provide little new business for U.S. shipyards. Domestic shipbuilders also stated that U.S. shipowners will not be encouraged to procure their commercial vessels in U.S. shipyards as the proposed legislation affords foreign shipyards an equal competitive footing by allowing them to gain U.S. Government assistance if they enter into joint ventures or license agreements with shipbuilders or operators.

With regard to product diversification, many of the shipbuilders responding to the Commission's questionnaire stated that they are already involved in steel fabrication for some nonmaritime products. However, the industry feels that there is not enough business to fully utilize the capacity of domestic shipyards. Additionally, they strongly question whether the industry can even be competitive in such areas as bridge building, sewer pipes, prefabricated housing units, trash incinerators, as well as oil refinery equipment sections.

The domestic shipbuilding and repair industries were generally in favor of Government-sponsored research to assist their efforts to increase their competitiveness. However, some industry representatives expressed concern that the free technology transfer arrangement under the current legislation would stifle competition among U.S shipyards. In addition, the research body created would be similar to European arrangements, which the domestic industry has judged unsuccessful. Questionnaire respondents also noted that many shipbuilders are already involved in joint ventures with foreign shipyards. In conclusion, the industry felt that the National Shipbuilding Research and Development Corporation would be of more assistance to the maritime supplier base than the actual shipbuilders or ship repairers.

1/ In the Commission's questionnaire, U.S. shipbuilding and repair firms were asked to comment on H.R. 3399, The Maritime Redevelopment Bank Act of 1983. Since there are only a few major differences in this legislation and the currently proposed bill (as outlined earlier in this report) the industry's comments are applicable to the present legislation.

The Shipbuilders Council of America, which represents the bulk of the major commercial shipbuilders and repair firms in the United States, echoed the industry's comments in their submission to the Commission. The Council feels that if the Maritime Redevelopment Bank's objective is to provide parity in vessel financing on world terms, a broader spectrum of financing terms and conditions is needed. Under the currently proposed legislation, the loans and guarantees extended by the Bank will not allow it to compete with much of the financing offered abroad. Also, they are opposed to the provision in the bill that will allow U.S. shipowners to obtain approval to use the Bank's financing to have commercial ships built in foreign shipyards.

A major U.S. shipbuilder, in a separate submission to the Commission's investigation record, stated that it does not believe that the passage of the Maritime Redevelopment Bank Charter Act of 1985 will materially affect the underlying problems of the U.S. merchant marine and shipyards for the reasons stated above. Both this firm and the Shipbuilders Council assert that financing subsidies will not encourage domestic construction of commercial ships unless there is cargo available to assure an adequate return to shipowners on their investment.

Ship operators' perspective.--The Council of American Flag Operators, which represent U.S.-flag commercial shipping concerns, has indicated general support for the proposed legislation. However, the Council has expressed doubts regarding the Bank's ability to provide parity of costs with many foreign shipbuilders.

Labor's perspective.--In recognition of the fact that a financing mechanism is essential in restoring the competitiveness of the domestic shipbuilding industry, the Metal Trades Department of the AFL-CIO has indicated support for the enactment of H.R. 33, The Maritime Redevelopment Bank Charter Act of 1985. However, this union organization feels that the legislation should be modified so that there will not be a resort to foreign construction unless the price of a commercial ship built in a U.S. shipyard exceeded the delivered price from a foreign yard by a specified percentage. 1/

The Maritime Trades Department of the AFL-CIO, however, has stated that unless trade and cargo restrictions imposed by some of our major trading partners are eliminated, the provisions of the proposed legislation will be ineffective in assisting the domestic shipbuilding industry. The labor union reiterated the domestic industry's view that legislation to increase the amount of cargo carried by U.S.-flag vessels is necessary in order to stimulate construction of commercial ships in domestic shipyards. 2/

Selected U.S. Government agencies' perspectives.--Within the U.S. Government, the response to the Maritime Redevelopment Bank Act, as proposed under H.R. 3399 and H.R. 33, has been varied. The U.S. Department of Transportation, Maritime Administration, opposes the legislation, stating that it would not achieve its stated purpose, but would only increase Federal

---

1/ Statement of Paul J. Burnsky, President, Metal Trades Department, AFL-CIO, before the Merchant Marine Subcommittee, Apr. 30, 1984.

2/ Statement of Frank Drozak, President, Maritime Trades Department, AFL-CIO, before the Merchant Marine Subcommittee, Aug. 8, 1984.

Government involvement in the shipbuilding and shipping industry and in private-capital markets, increase ineffective subsidies to the maritime industry, and raise the Federal deficit. 1/

The Congressional Office of Technology Assessment, however, has stated that the Federally sponsored research and development consortium proposed could provide a comprehensive approach to the problem of research in the shipbuilding and ship-repair area. 2/ The General Accounting Office has asserted that implementation of the bill would speed up technological innovation, enabling U.S.-built commercial ships and industrial products compete in world markets. Additionally, it would allow domestically constructed vessels (both commercial and military) to be built faster and at a lower cost. 3/

Cargo Preference

Another Government initiative proposed to assist the U.S. commercial shipbuilding industry is a requirement that U.S.-traded goods be carried on U.S.-flag carriers. The principal legislation, H.R. 1242, "The Competitive Shipping and Shipbuilding Act of 1983," was introduced on February 3, 1983 by Congresswoman Lindy Boggs, and was referred to the House Committee on Merchant Marine and Fisheries. A public hearing on the bill was held on May 4, 1983, in Washington, DC. The bill's companion legislation of the same name, S.1000, was introduced by Senator Paul Trible on April 7, 1983,and was referred to the Senate Committee on Commerce, Science and Transportation. These bills were reintroduced in late 1983 as H.R. 6222, "The Competitive Shipping and Shipbuilding Act of 1983," and S.1624, "The Merchant Marine Revitalization Act of 1983." Both bills seek to promote increased ocean transportation of bulk commodities by U.S.-flag ships in the foreign commerce of the United States. The bills would require all U.S. importers and exporters to transport 5 percent of their bulk cargo on U.S.-flag carriers 1 year after enactment of the legislation. The percentage would rise 1 percentage point each year to a maximum of 20 percent at the end of 15 years. However, at the end of the first 5 years, U.S. shipbuilders and ship operators are required to show that they have reduced their costs (in real terms) by 15 percent under H.R. 6222, and 20 percent under S.1624, in order for the share of impelled cargo to increase. Although the legislation expired at the end of the 98th Congress, Congresswoman Boggs' office indicated that their bill would be reintroduced in mid-1985. 4/

U.S. shipbuilding industry's perspective.--The domestic shipbuilding industry has asserted that the cargo preference legislation discussed above represents a positive step forward in the formulation of a national maritime

---

1/ Robert F. Morrison, "Administration Opposes Yard Bank Aid Plan," Journal of Commerce, Aug. 9, 1984.

2/ Testimony of Peter A. Johnson, Office of Technology Assessment, before the Subcommittee on Merchant Marine, House Committee on Merchant Marine and Fisheries, June 20, 1984.

3/ Consultations with officials of the National Security & International Affairs Division, General Accounting Office, November 1984.

4/ Telephone conversation with Congresswoman Boggs' office, Jan. 30, 1985.

policy. Because this legislation would stimulate a rebuilding of the U.S.-flag bulk-cargo fleet in domestic shipyards, industry representatives, in response to Commission questionnaires, stated that the bills would reverse the decline of the commercial maritime industry. The Shipbuilders Council of America also expressed strong support for cargo preference legislation. Citing a study performed by the center for Naval Analysis, the association states that the program would result in the construction of approximately 300 vessels over a 15-year period and have little or no effect on the Federal Treasury.

Labor's perspective.--Officials of labor unions representing shipyard workers involved in metal trades and electrical work have expressed strong support for the cargo preference legislation under discussion. They feel that it would help to rebuild the American shipbuilding and repair industries, as well as strengthen U.S. national defense. The Maritime Trades Department of the AFL-CIO has also commented favorably on the bills, stating that it will create more than 27,000 jobs-- 18,600 in domestic shipyards and related supplier facilities and over 8,000 on U.S.-flag vessels. 1/

Selected U.S. Government agencies' perspectives.--The U.S. General Accounting Office, while not expressing any opinion on the specific cargo preference legislation under study in this report, has addressed the general issue of cargo preference in a study completed in early 1984. Their report stated that one of the major effects of this type of legislation is that additional U.S. flag ships and American crews are employed to transport the affected cargo. However, the other major effect is that the cost of shipping the cargo is often significantly more expensive than would be the case if less costly foreign flag ships were used. 2/

The U.S. Maritime Administration, U.S. Department of Transportation, has expressed opposition to the cargo preference legislation. Its main objection to this type of assistance to the industry is that the bills will raise shipping costs, impair the export of bulk commodities, and have an adverse impact on U.S. foreign relations. Additionally, the legislation would place an administrative burden on the Federal Government to monitor the program. 3/

The U.S. Department of Agriculture, while not specifically addressing these proposed cargo preference legislations, is attempting to exempt agricultural exports financed under their blended credit program, and possibly all USDA exports programs, from current cargo preference requirements. The USDA and farm groups believe that the U.S. agriculture industry will lose their competitiveness in export markets because of higher U.S. shipping costs. Additionally, they claim that there will be little benefit to the maritime industry by requiring that a specified portion of their exports be transported on U.S.-flag ships. 4/ However, a recent U.S. District Court decision found that exports under the USDA blended credit program are not exempt from cargo preference requirements.

1/ Testimony of Frank Drozak on H.R. 1242, May 4, 1983.

2/ U.S. General Accounting Office, Economic Effects of Cargo Preference Laws, Jan. 31, 1984, p. i.

3/ "Sheer Rejects Cargo Preference," American Shipper, August 1983, p. 22.

4/ "Block to Press Cabinet to Exempt Farm Exports From Cargo Preference," Inside U.S. Trade, Mar. 15, 1985.

Likely impact of the proposed initiatives on the U.S. industries

All of the proposed Government initiatives recognize the need for a comprehensive national maritime policy. However, according to data collected during the investigation, the tax relief proposal, subsidies, and financing policies suggested in the Office of Technology Assessment report and the Maritime Redevelopment Bank Charter Act of 1985 are unlikely to be sufficient to allow the U.S. commercial shipbuilding and repair industries to effectively compete in the world market. The provision of the Maritime Redevelopment Bank legislation that allows construction of commercial vessels in foreign shipyards under specified circumstances could actually harm the domestic industry. Its effect could be to promote increased shipbuilding activity in foreign yards.

The proposals for increased U.S. Government assistance in research and development contained in the OTA report and the above -mentioned legislation could be effective in modernizing the industry and increasing productivity if the U.S. shipyards could be persuaded to fully take advantage of the provisions of the proposed measure. The creation of a national research center is one proposal for assistance to the industry. The results of the research undertaken by the center would be shared with all domestic shipbuilders so that the U.S. industry would have access to the latest technologies. Industry wide cooperation and participation in shared technologies may be difficult to accomplish because of the fact that there is such a high degree of competition in the industry, especially in the defense area where much of the new technology is utilized.

The shipyard diversification plan envisioned under H.R. 33 would be unlikely to gain the support of many of the larger U.S. shipbuilders, as they have expressed a strong desire to concentrate on U.S. Navy maritime activities. Additionally, there is not adequate data available to assess the potential markets for the alternative products noted as possible avenues of diversification for the shipyards. Many of them, however, are subject to the same cyclical market forces that currently affect commercial shipbuilders.

Cargo preference legislation, while it would assist U.S. shipbuilders, can be both ineffective and expensive. 1/ The cargo preference legislation as proposed will require shipyards to decrease their cost by 15 percent. This will not resolve the industry's fundamental problems, nor increase their world competitiveness. It will, however, pass on the costs of supporting the maritime industry to the American public, in the name of maintaining adequate national defense capability.

As suggested in the preliminary staff draft of NACOA report, the shipbuilding and shipping industries should not be addressed separately, as the structures of both have changed significantly since the amendment of the Merchant Marine Act in 1970. The elimination of federal subsidies, and the 50-percent ad valorem repair duty, and modification of the CCF and the Merchant Marine Act of 1970, would likely decrease the building and repair activity of the domestic industry to a very limited extent. The above-noted programs have generated minimal new construction of commercial vessels, and U.S. flag carriers are currently having much of their repair work done abroad.

1/ U.S. General Accounting Office, Economic Effects of Cargo Preference Laws, Jan. 31, 1984.

APPENDIX A

LETTER OF REQUEST FROM CHAIRMAN, SUBCOMMITTEE ON TRADE, COMMITTEE ON WAYS AND MEANS, U.S. HOUSE OF REPRESENTATIVES

COMMITTEE ON WAYS AND MEANS

U.S. HOUSE OF REPRESENTATIVES

WASHINGTON, D.C. 20515

SUBCOMMITTEE ON TRADE

September 11, 1984

Honorable Paula Stern
Chairwoman
U.S. International Trade Commission
701 E Street, N.W.
Washington, D.C. 20436

Dear Madam Chairwoman:

The potential for trade distortion resulting from foreign government involvement in the commercial shipbuilding industry has become an area of increasing concern. The Congress is now considering a draft substitute amendment to H.R. 3399--The Maritime Redevelopment Act--which proposes a long-term strategy for modernizing and revitalizing the commercial shipbuilding and repair industry and supporting maritime infrastructure. A copy of the draft amendment is enclosed.

My colleague Mario Biaggi, Chairman of the Subcommittee on Merchant Marine, is interested in obtaining an independent view of the current competitive position of the U.S. shipbuilding industry as a basis for evaluating the effectiveness of the proposed legislation. I am, therefore, requesting that the U.S. International Trade Commission conduct an investigation under the authority of section 332 of the Tariff Act of 1930, and report to me on the current competitive condition of the U.S. commercial shipbuilding and repair industry vis-a-vis that of other countries. The study should address and compare the levels of U.S. vs. foreign government intervention, including financing incentives and export promotion allowances, for the past 5-year period and examine the resultant impact of such intervention on the commercial shipbuilding industry in the United States. Finally, the study should address the

likely impact on the U.S. commercial shipbuilding industry of the revitalization strategy outlined in the recent report of the Congressional Office of Technology Assessment and contained in the draft substitute amendment to H.R. 3399.

I would appreciate receiving your report not later than April 1, 1985.

Sincerely,

Sam M. Gibbons
Chairman

SMG/JN1

cc: Congressman Mario Biaggi

APPENDIX B

NOTICE OF INSTITUTION OF INVESTIGATION NO. 332-197

[332-197]

Analysis of the International Competitiveness of the U.S. Commercial Shipbuilding and Repair Industries

AGENCY: United States International Trade Commission.

ACTION: Institution of an investigation under section 332(n) of the Tariff Act of 1930 (19 U.S.C. 1332(b)) for the purpose of presenting information on the current competitive factors affecting the U.S. shipbuilding and repair industries.

EFFECTIVE DATE: October 4, 1984.

FOR FURTHER INFORMATION CONTACT: Ms. Debby Ladomirak (telephone 202-523-0131) or Mr. Harold Graves, Machinery and Equipment Division (telephone 202-523-0354), U.S. International Trade Commission, Washington, D.C. 20436.

Background and Scope of Investigation

At the request of the Subcommittee on Trade of the Committee on Ways and Means of the U.S. House of Representatives, the Commission has instituted investigation No. 332-197 under section 332(b) of the Tariff Act of 1930 (19 U.S.C. 1332(b)) for the purpose of gathering and presenting information on the competitive and economic factors affecting the U.S. shipbuilding and repair industries vis-a-vis that of other countries. Specifically, the Commission has been asked to address and compare the levels of U.S. versus foreign government intervention, including financing incentives and export promotion allowances, for the past 5-year period and examine the resultant impact of such intervention on the commercial shipbuilding industry. In addition, the Commission is to assess the likely impact on the U.S. commercial shipbuilding industry of the revitalization strategy outlined in the recent report of the Congressional Office of Technology Assessment and contained in the draft substitute amendment to H.R. 3399—The Maritime Redevelopment Act—which proposes a long-term strategy for modernizing and revitalizing the commercial shipbuilding and repair industry and supporting maritime infrastructure. The Commission expects to complete its study by April 1, 1985.

Written Submissions

Interested persons are invited to submit written statements concerning the investigation. Written statements should be received by the close of business on December 10, 1984. Commercial or financial information which a submitter desires the Commission to treat as confidential must be submitted on separate sheets of paper, each clearly marked "Confidential Business Information" at the top. All submissions requesting confidential treatment must conform with the requirements of § 201.6 of the Commission's *Rules of Practice and Procedure* (19 CFR 201.6). All written submissions, except for confidential business information, will be made available for inspection by interested persons. All submissions should be addressed to the Secretary at the Commission's office in Washington, D.C.

Issued: October 5, 1984.

By order of the Commission.

Kenneth R. Mason,
Secretary.

[FR Doc. 84-26991 Filed 10-10-84; 8:45 am]
BILLING CODE 7020-02-M

APPENDIX C

SELECTED COUNTRY PROFILES

Japan

Industry profile

During the late 1940's, as part of its postwar efforts to rebuild basic industries, the Japanese Government established a shipbuilding program to encourage growth in the industry. As a result of this program, the 1950's and 1960's were a period of growth and stable demand for Japanese shipbuilders. By the mid-1960's, Japan had become the world's lowest cost producer of commercial ships and held close to 50 percent of new shipping tonnage. The availability of low cost steel and labor contributed to this success. 1/

Japan has dominated the world's shipbuilding market for the past 20 years. 2/ The Japanese national commitment to stability within the industry, combined with an efficient vertically interrelated material support structure, has contributed to Japan's leadership position in merchant-ship construction. 3/ In 1974, Japan's ship production reached a peak of 15 million gross tons. 4/ However, the 1973-74 oil crisis led to a worldwide recession, and shipbuilding orders fell into a slump. The full impact of the crisis was not felt until 1978 and 1979. Between 1975 and 1978, 45 small shipbuilders filed for bankruptcy or requested Government protection. 5/

As of April 1, 1983, there was a total of 298 Japanese shipbuilding firms, 136 of which were certified by the Japanese Government. 6/ Until 1981, seven major Japanese shipbuilders accounted for 70 percent of Japan's shipbuilding market: Mitsubishi Heavy Industries, Ishikawajima-Harima Heavy Industries, Kawasaki Heavy Industries, Nippon Kokan, Mitsui Engineering and Shipbuilding, Hitachi Zosen Corp. and Sumitomo Heavy Industries. In March 1983, these seven major companies accounted for 50 percent of the market. Four other companies located on the Soto Inland Sea Coast were growing in importance- Koroshima Dockyard and Co.; Imabari Shipbuilding Co. (located in Ehime Prefecture); Tsuneishi Shipbuilding Co. and Koyo Dockyard Co. (based in Hiroshima Prefecture). 7/ As shown in table C-1 the two leading shipbuilders controlled about one-third of total new construction in 1983 (in gross registered tonnage), and Imabari Shipbuilding had become the third largest shipbuilder, accounting for 8.3 percent of total new construction. 8/

1/ U.S. General Accounting Office, Industrial Policy: Case Studies in the Japanese Experience, GAO/10-83-11, Oct. 20, 1982, p. 58.

2/ "World Shipping," Maritime Reporter/Engineering News, Jan. 1, 1983, p. 62.

3/ U.S. Department of the Navy, Approaches to Improving Shipbuilding Productivity, 1983, p. 9.

4/ U.S. Department of State Telegram, U.S. Embassy, Tokyo, Japan, Sept. 27, 1979, p. 2.

5/ Ibid.

6/ Official statistics of Japan's Ministry of Transport, 1983.

7/ "Industrial Review of Japan, 1983-Shipbuilding," The Japan Economic Journal, March 1983, p. 73.

8/ Official statistics of Japan's Ministry of Transport, 1983.

Table C-1.--Percentage distribution of market shares in the Japanese shipbuilding industry, by firms, 1983

Firm	Percentage distribution of total new construction
Mitsubishi Heavy industries	15.1
Ishikawajima-Harima Heavy Industries	13.9
Imabari shipbuilding Co., Ltd	8.3
Kawasaki Heavy Industries	8.1
Hitachi Zosen Corp	7.5
All other	47.1
Total	100.0

Source: Compiled from official statistics of the Japanese Ministry of Transport.

As of April 1, 1983, there were 91 ship-repairing firms. As table C-2 indicates, the five largest firms received one-half the sales value of Japan's ship orders in fiscal year 1983.

Table C-2.--Major Japanese ship-repairing firms and their market shares, 1983

(In percent)

Firms	Ratio of the value of total repairs to total sales
Hitachi Zosen	16.1
Mitsubishi Heavy Industries	14.0
Ishikawajima-Harima Heavy Industries	11.6
Mitsui Engineering & Shipbuilding	10.8
Nippon Kokan	8.9

Source: Compiled from official statistics of the Japanese Ministry of Transport.

In the late 1970's the Japanese Ministry of Transport requested that the Shipping and Shipbuilding Rationalization Council make recommendations for rationalizing the industry. From November 1978 until March 1980, operational capacity was reduced by 37 percent to 6.19 million gross registered tons (table C-3). 1/ The seven major shipbuilders were not included in the rationalization plan because the Government felt that these companies had sufficient resources to handle the cutbacks. An association was set up to assist smaller builders in divesting themselves of shipbuilding facilities and equipment. Another organization was established to provide subsidies for

1/ "Competition Crimps Japan's Shipyards," Journal of Commerce, Oct. 25, 1984, p. 12A.

scrapping ships of 2,500 gross tons or over and a target was set to scrap 4 million gross tons by FY 1985. This goal is unlikely to be met since only 2 million grt had been scrapped by October 1984.

Table C-3.--Disposal of Japanese surplus shipbuilding facilities, November 1978-May 1984

Category of shipbuilding company	Number of firms	Disposal Target	Capacity before disposal	Capacity after disposal	Rate of achieving target
		Percent	--Million gross tons--		Percent
Major companies	7	40	6.69	3.43	99
Upper middle rank companies	17	30	2.89	2.05	119
Lower middle rank companies	16	27	.79	.45	119
Other companies	21	15	.40	.26	81
Total or average	61	35	10.77	6.19	105

Source: Speech by Ram Ramsay, Director of the Office of Maritime Affairs and Shipbuilding Technology, Naval Sea Systems Command, Shipbuilding - A National Defense Asset," May 17, 1984.

Japanese-built ships are leaders in design. Industry sources attribute their success in this area to extensive research and new capital expenditures by Japan's shipbuilding and repair industry. The following tabulation, compiled from official statistics of the Japanese Ministry of Transport, shows that research and development expenditures doubled during fiscal year 1979-82, from $18 million to $36 million.

Fiscal Year	Value of research and development (in millions of dollars)
1979	18
1980	22
1981	30
1982	36
1983	1/

1/ Not available.

A fund of $64 million from private sources has been set up for a study on the development of shipbuilding. The purpose of the study is to develop a highly automated ship operation system, a highly reliable propulsion system, and a new accomodation and life saving system. 1/

A major part of Japanese shipbuilders' research and development efforts have gone to automation and ship repair. 2/ A fund of $20,000 million has

1/ Annual Report on World Shipbuilding, 1983, Report No. Mar. 8010.
2/ "Far East Shipyards," Marine Engineering Log, September 1983, p. 40.

been set aside to introduce robots to shipyards to perform tasks that are hazardous to humans. 1/ Most of the major shipbuilders are utilizing robots at their shipyards in order to offset the competitive advantage held by countries with low-cost labor such as Korea. 2/

The following tabulation, compiled from official statistics of the Japanese Ministry of Transport, shows that investment facilities and equipment increased from $40 million in 1979 to $120 million in 1982 and then dropped to $105 million in 1983:

Fiscal Year	Value of investment for facilities and equipment (million dollars)	Number of shipyards
1979---------	40	36
1980---------	52	28
1981---------	120	28
1982---------	120	28
1983---------	105	28

Industry sources cite the rationalization program of the Japanese shipbuilding industry for the relatively stable pattern of investments in recent years.

For 20 years, Japan has been expanding its technological cooperation to developing countries. 3/ In September 1984, four Japanese shipbuilders announced agreements with several Chinese shipyards to modernize their facilities. 4/ In May 1984, one of Japan's largest shipbuilders signed an agreement with a U.S. firm to transfer technology used in the construction of new ships and in major conversions and retrofits. The agreement is important because it gives Japan a chance to break into the U.S. market in this area. 5/ In October 1984, the same Japanese company signed an agreement with a British shipbuilder that is likely to cover computer aided design and manufacturing. 6/

The downturn in shipbuilding demand in the late 1970's led to a rapid drop in employment. Employment declined by 55 percent from 361,000 workers in 1974 to 162,580 workers in 1979. The large turnover during this 6-year period can be attributed in part to the flexibility of the workers and the use of subcontractors. Another factor influencing the mobility of the Japanese shipbuilders at this time was the low wage rates in the shipbuilding industry compared with those in other industries. Between 1979 and 1983, as table C-4 shows,

---

1/ U.S. Department of Transportation, Maritime Administration.

2/ U.S. Department of Defense, Coordinator of Shipbuilding, Conversion, and Repair, Annual Report on the Status of the Shipbuilding and Ship Repair Industry, of the United States 1983, December 1984, p. 8-5.

3/ "Industrial Review of Japan 1983 - Shipbuilding," The Japan Economic Journal, Mar. 3, 1983, p. 73.

4/ "Japan Ready to Help China Modernize Shipyards," Japan Economic Journal, Sept. 4, 1984, p. 11.

5/ "Mitsubishi in U.S. Link," Fairplay, May 24, 1984, p. 10.

6/ "British Shipbuilders Sign Deal in Technology with Mitsubishi," Financial Times, Oct. 16, 1984, p. 18.

employment in the shipbuilding and repair industries declined by 7 percent. Employment peaked at 170,999 in 1981 and then declined by 12 percent in 1983 because of sluggish orders from overseas. During 1979-83, wages climbed, however, by 23 percent.

Table C-4.--Employment and earnings in Japan's shipbuilding and repair industries, 1979-83

Item	1979	1980	1981	1982	1983
Number of employees 1/	162,580	164,210	170,997	164,468	150,926
Average monthly wages	$654	$697	$745	$789	$807
Yearly bonus	$1,577	$2,462	$3,126	$3,491	$3,477

1/ Data on employees do not include subcontracted employees. In 1979, subcontractors represented about 30 percent of shipbuilding employees. Statistics regarding subcontracting for 1980-83 are not available.

Source: Compiled from official statistics of the Japanese Ministry of Transport.

During the recession, the Japanese Government and private sector assisted in the adjustment process by retraining and relocating employees. 1/ For example, Japan's top shipbuilder transferred more than 250 workers from its shipbuilding division to its auto marketing firm. 2/ Another company retrained workers to build jet engines and shifted some workers to its nuclear power division. In addition, many workers were forced to retire at age 55. 3/ A number of Japanese shipbuilding engineers were also hired by Korean yards. 4/ Presently, the major employment problems facing the Japanese shipbuilding industry are the aging workforce and a lack of interest on the part of young workers in entering the shipbuilding industry. 5/

The following tabulation shows total commercial ship construction during 1979-83. 6/

1/ U.S. General Accounting Office, Industrial Policy: Case Studies in the Japanese Experience, GAO/10-83-11, Oct. 20, 1982, p. 58.
2/ "Industrial Review of Japan, 1983 Shipbuilders", Japan Economic Journal, Mar. 3, 1983, p. 72.
3/ Op. cit., Industrial Policy: Case Studies in the Japan Experience, p. 58.
4/ U.S. Department of Defense, Annual Report on the Status of the Shipbuilding and Ship Repair Industry of the United States 1983 December 1984, p. 8-5.
5/ Ibid.
6/ Official statistics of the Japanese Ministry of Transport.

Year	Volume of construction (gross registered tons) 1/	Value of construction (millions dollars)
1979----------	4,452,127	3,408
1980----------	4,985,875	2/
1981----------	8,357,182	25,931
1982----------	7,935,723	5,946
1983----------	6,442,740	5,550

1/ Includes ships over 2,500 grt.
2/ Not available.

According to the data above, the volume of production almost doubled from a low of 4.5 million grt in 1979 to 8.4 million grt in 1981. Production further declined during 1982-83.

New orders for commercial vessels for the Japanese shipbuilding industry totaled 4.1 million grt during January-July 1984, compared with 10.9 million grt for all of year 1983. Industry sources indicate that the decline reflects the overcapacity in the world market and the decline in new orders worldwide. 1/ The tabulation below indicates that the total value of repair work, according to an October 31, 1981 Journal of Commerce article, fluctuated during fiscal years 1979-83 (in millions of dollars):

Fiscal year	Value of repairs
1979----------	911
1980----------	1,338
1981----------	1,089
1982----------	1,502
1983----------	1,120

According to Japanese industry sources, the shipbuilding and repair industries have remained profitable during 1979-82 (the latest period for which data are available) (table C-5). The sales figures for new construction in the following table reflect the slight recovery that occurred in 1979 and the decline in orders that has occurred since 1981.

Japan's shipbuilding industry depends on export orders for approximately 70 percent of its total orders. During 1980-83, exports from Japanese yards fell by one-half, in part because of the depression in worldwide shipbuilding and the competition from South Korea. 2/

During the first half of 1984, new export orders for Japanese shipyards amounted to 2.5 million grt compared with 6 million grt during the same period in 1983. 3/ The 1983 figure was inflated, however, because of a sharp

1/ A. E. Cullison, "Japanese Ponder Changes in Rate of Shipyard Cutbacks" Journal of Commerce, Oct. 31, 1981, p. 1.
2/ "Far East Shipyards," Marine Engineering log, September 1983, p. 38.
3/ "Japan's Ship Orders Down 60 Percent First Half", Financial Times, Oct. 19, 1984, p. 12.

Table C-5.--Net sales and net income in Japan's shipbuilding and repair industries, 1979-82

(In millions of dollars)

Item	1979	1980	1981	1982
Net sales (new construction)	2,370	2,523	3,429	2,967
Net sales (ship repair)	638	1,070	1,191	786
Net sales (other activities)	10,525	11,308	13,932	14,188
Total net sales	13,533	14,901	18,552	17,941
Net income before taxes	120	200	483	357

Source: Compiled from official statistics of the Japanese Ministry of Transport.

increase in overseas orders for bulk carriers. Beginning in September 1984, the foreign order backlog was down to 539 ships, totaling 11.9 million grt. 1/

Although Japanese shipbuilding is expected to remain competitive in the long run, short-and medium-term prospects are not as optimistic. The demand for new ships is expected to drop significantly in the near future and is projected to total 3.2 million grt in 1985, which will utilize only 50 percent of current production capacity. 2/

Government involvement

Developing its domestic shipbuilding industry has long been a priority of the Japanese Government. Shipbuilding was one of the first industries targeted for development by the Meiji Government in 1896 3/ (the steel and machinery industries were also first promoted at that time) and among nine industries slated for major production buildups in the late 1930's. 4/ Indeed, the subsidized 5/ and protected shipbuilding industry was one of the

1/ "Builders Have Hard Time Coping With Stagnating Orders and Korean Advances", Japan Economic Journal, 1983, p. 72.

2/ Official statistics of the Japanese Ministry of Transport.

3/ In 1896 the Government promulgated the Shipbuilding Promotion Law and the Navigation Promotion Law. The laws provided incentives for the establishment of ocean shipping lines and the construction of large ocean-going vessels.

4/ The Shipbuilding Industry Law was passed on Apr. 5, 1939. Other laws passed during the late 1930's related to the promotion of the petroleum, auto, petrochemicals, steel, machine tool, aircraft, light metals, and machinery industries.

5/ Under the Subsidy Facility for Improvement of Ships of 1932-37, for example, outmoded ships were scrapped and subsidies given for the purchase of new ships, the amount depending on the speed of the new ship. Under this program, 119 ships of 500,000 gross tons were scrapped, and 48 new ships of 300,000 gross tons were built, accounting for 30 percent of the gross tonnage built between 1933 and 1938. The shipbuilding industry was also one of six slated in the Five Year Plan for Key Industries for intensive development between 1937-41. (See Takafusa Nakamura, Economic Growth in Prewar Japan, New

fastest growing manufacturing industries in prewar Japan. 1/ The shipbuilding industry was also one of the first to be identified by the Government as crucial to Japan's economic development in the postwar period. Government policies in the postwar period have both prompted the changes in Japan's competitive standing in the world shipbuilding industry and continually changed to accommodate them.

The measures used by the Government in the postwar period were designed to assure steadily growing demand for new ships, mainly by providing low-interest loans to support the Government-sponsored shipbuilding programs. The loans are used to finance purchases of Japanese-built vessels. Purchasers of particular kinds of ships are often eligible for more favorable loan terms and direct subsidies. Meanwhile, tax policies encourage the rapid modernization of the merchant fleet and rapid introduction of new technologies by shipbuilders.

Before World War II, the Japanese Government relied almost exclusively on subsidies to assist domestic shipbuilders and ship operators. In the postwar period, the Government has consistently used three major tools to encourage the shipbuilding industry's development: a planned shipbuilding program, preferential financing; and tax benefits. The Government also encouraged mergers and gave research and development assistance to Japanese shipbuilders. (The Government does not operate any shipbuilding yards itself.) Each of these policy tools are described in detail below.

The planned shipbuilding program.--The principal demand support method employed by the Government is a planned shipbuilding program. Under the program, the Government announces each year how many and what type of ships will be eligible for Government-backed loans and subsidies. Shipbuilders are then eligible for low-interest loans from the Japan Development Bank during the construction phase. Japanese ship operators are eligible for Japan Development Bank (JDB) loans for their purchases of Japanese ships, while foreign ship operators are eligible for Export-Import Bank of Japan (JEXIM) loans. Loan guarantees are also available from the Government. The tonnage of vessels built under the program reached its peak in the early 1970's, as illustrated in table C-6.

The planned shipbuilding program gives the Government substantial influence over Japan's shipping and shipbuilding industries. An annual ceiling on the amount of funds to be made available for the purchase of ships is set by the Government, along with the number and types of ships to be financed. This affords the Government significant influence over the price of newly built ships. Furthermore, the types of ships eligible for particularly attractive JDB financing and subsidies reflect its overall industrial priorities and specific goals for the maritime sector. From 1950 to 1955, for example, the Government emphasized liner construction, while from 1955 to 1965, it emphasized large tankers and specialized carriers. In the latter

1/ The shipbuilding industry was the fastest growing manufacturing industry from 1895 to 1900, 1910-1918, and 1933-37. Takafusa Nakamura, Economic Growth in Prewar Japan, New Haven: Yale University Press, 1983, p. 64-65.

Table C-6.--Production under the Japanese Government shipbuilding program, 1951-83

Year	Government shipbuilding program		Program's share of Japanese fleet	
	Number of vessels	Weight	Vessels	Tonnage
		1,000 gross tons	Percent	
1951	48	374	96.0	98.4
1952	36	293	87.8	84.7
1953	37	312	92.5	96.6
1954	19	154	95.0	92.2
1955	19	184	55.9	61.7
1956	34	314	47.2	54.4
1957	46	415	41.1	49.2
1958	25	257	52.1	47.5
1959	19	180	33.3	32.4
1960	16	192	35.6	36.2
1961	27	498	48.2	46.2
1962	13	393	59.1	67.6
1963	18	567	75.0	82.3
1964	41	1,209	64.1	83.7
1965	65	1,825	60.7	81.2
1966	75	1,909	45.2	75.4
1967	56	2,033	41.2	72.4
1968	57	2,308	29.2	68.7
1969	57	2,474	25.6	66.4
1970	45	2,624	27.1	70.3
1971	41	3,218	21.4	61.0
1972	37	3,304	29.4	67.0
1973	25	1,985	28.7	59.4
1974	25	1,939	29.4	55.1
1975	14	945	11.5	33.4
1976	10	165	8.7	11.5
1977	12	258	12.6	21.9
1978	9	302	10.2	27.6
1979	32	1,627	24.6	57.7
1980	31	1,838	28.4	66.2
1981	25	1,802	23.8	59.0
1982	16	679	16.2	41.7
1983	19	998	18.1	44.7
Total or average, 1951-1983	1,049	37,575	30.0	60.0

Source: Compiled from official statistics of the Japanese Ministry of Transport.

half of the 1960's, the Government supported construction of a large fleet of containerships. The Government has favored specialized carriers in recent years, according to official statistics of the Japanese Ministry of Transport, as illustrated in the following tabulation of the types of new ships constructed under the Government's shipbuilding program during 1979-83, (in thousands of grt):

Type	1979	1980	1981	1982	1983
Liners:					
Container ships-----	162	134	-	98	101
Other----------	-	35	-	30	-
Specialized carriers--	475	763	1,238	238	872
Oil tankers----------	989	589	247	211	25
LNG tankers----------	-	317	317	102	-
Total----------	1,626	1,838	1,802	679	998

Preferential financing.--The Government makes low cost funds available to both domestic and foreign firms for ship purchases and ship construction. The four main preferential financing schemes are: (1) direct subsidies; (2) JDB loans; (3) Export-Import Bank loans; and (4) Maritime Credit Corporation loans. Direct subsidies are currently provided for by budget allocations. Loans are provided through the Fiscal Investment and Loan Program (FILP), which channels funds to the sectors of Japan's economy that have been slated by the Government for growth. 1/ The JDB and JEXIM are both FILP lending agencies. During 1980-82, FILP funds accounted for about 8 percent of all loans to the shipbuilding industry and more than half of all loans to the shipping industry. 2/

Direct subsidies to ship operators.--The Government has offered direct subsidies, equaling between 2.5 and 3.5 percent of their interest expenses on loan funds to ship operators who purchase particular types of domestically produced ships. The subsidies are provided under the 1953 Law for the Subsidization of Interest Payments on Loans for Construction of Oceangoing Vessels and are given directly to ship operators by the Ministry of Transport. The subsidization ratio is altered from year to year in consideration of budget restraints, the condition of the shipbuilding market, and the business performance of shipping firms. The system was suspended three times--during 1957-59, 1975-78, and from 1982 to the present. Under the 1979-81 program, $235 million in subsidies were given over an 3-year period to ship operators. The subsidies were used to finance construction of more than 1 billion grt of ships. 3/

1/ For a more detailed discussion of the Fiscal Investment and Loan Program, see U.S. International Trade Commission, Foreign Industrial Targeting and its Effects on U.S. Industries, Phase I: Japan, October 1983, pp. 78-100.

2/ Ibid., p. 91.

3/ Seatrade, January 1980, p. 79, U.S Department of Transportation, Maritime Administration, Maritime Subsidies, January 1981, p. 94.

Loans from the Japan Development Bank.--The Japan Development Bank extends long-term, low-interest loans to Japanese shipowners for the construction of oceangoing vessels and to shipbuilders to cover their construction costs. The terms of these loans are more favorable for construction of particular types of ships, depending on the Government's industrial priorities. Currently, ship operators that purchase container ships or LNG tankers qualify for loans that carry extended repayment periods, greater JDB participation, and longer grace periods than those accorded purchasers of ordinary vessels. Furthermore, they may also qualify for direct subsidies from the Ministry of Transport. The loans generally cover over 60 percent of total costs. Subsidies inherent in such loans were estimated by the U.S. International Trade Commission in 1983 to range between 1.6 and 2.0 percent of the value of the loan. 1/

During its first 20 years of operation (1951-71), JDB lending totaled approximately $13 billion. Ship operators received nearly one-third of the value of those loans, a total of about $4.1 billion, most of which was used to underwrite construction of new ships. 2/ JDB loans for the shipping industry from 1953 through 1980 are shown in the following tabulation (in percent): 3/

Period	JDB share of all loans to the shipping industry
1953-60	48.6
1961-70	59.9
1971-80	44.3

JDB loans have thus been instrumental in underwriting new ship construction. The shipbuilding industry has been the prime beneficiary of the JDB loan program, since the JDB requires that the ships constructed under its program be domestically built. The value of new loans for ship operators during 1951-83 is shown in table C-7. 4/

1/ U.S. International Trade Commission, Foreign Industrial Targeting and Its Effects on U.S. Industries, Phase I: Japan, p. 94 and Appendix C.

2/ Phillip H. Trezise, "Industrial Policy is Not the Major Reason for Japan's Success," The Brookings Review, Spring 1983, p. 19.

3/ Submission of Bradley M. Richardson to the U.S. International Trade Commission on investigation No. 332-162, Foreign Industrial Targeting and Its Effects on U.S. Industries, Phase I: Japan, p. A-6, based on data from the Bank of Japan.

4/ Ibid.

Table C-7.--Loans for Japanese ship operators, 1951-83

(In billions of yen)

Year	Value
1951	4.7
1952	6.1
1953	21.8
1954	16.3
1955	16.0
1956	15.9
1957	19.4
1958	16.8
1959	19.2
1960	13.1
1961	18.2
1962	21.4
1963	27.6
1964	45.9
1965	89.5
1966	92.2
1967	88.3
1968	97.5
1969	98.3
1970	106.9
1971	115.3
1972	135.6
1973	96.7
1974	78.6
1975	75.6
1976	50.1
1977	20.0
1978	33.1
1979	82.0
1980	130.0
1981	128.3
1982	134.4
1983	100.2
Total	2,015.0

Source: Compiled from official statistics of the Japan Developoment Bank, 1984.

The terms of JDB loans have changed periodically. More favorable terms are generally given for loans used to finance ships identified by the Government as being important to Japan's maritime competitiveness. The current terms are shown below: 1/

1/ The Japan Development Bank, Annual Report, 1983.

Item	Container ships and LNG carriers	Other vessels (tankers, and general cargo carriers)
Amount of financing by:		
Ship owner---percent----	10	25
JDB----------do----	60	50
City Banks--------do----	30	25
Interest rates:		
JDB----------percent--	7.3	7.3
City Bank---------do----	8.9	8.9
Term:		
JDB		
payment period years--	15	13
grace period-do-----	5	3

In 1983, the projects eligible for financing included construction of energy-efficient and labor-saving vessels and vessels designed to carry liquefied natural gas and coal. JDB loans to the shipping industry fell in 1983 by nearly one-fourth of those of the previous year, to 100.2 billion yen ($445 million). Most of the loans were for replacement of vessels such as container ships and iron ore carriers with more energy efficient ships. 1/

The Ministry of Transportation requested 135.5 billion yen from the FILP for fiscal 1985 (April 1, 1985-March 31, 1986), an increase of 26 billion yen over 1984. About 48 billion yen will be allocated for continued ship construction under the Government-sponsored shipbuilding program of 1984 and 87.5 billion yen for the 1985 building program. (The 1985 shipbuilding plan calls for building 1.8 million grt of vessels.) The interest rate will be pegged at 7.1 percent (compared with 7.3 percent in 1984). With the exception of loans to build super labor-saving ships, the terms will be the same as in 1984. JDB will supply up to 80 percent of the needed investment funding for the construction of such ships in 1985.

Loans from the Export-Import Bank.--Export credits for ships are also granted by the Export-Import Bank of Japan. At the end of January 1982, the Bank's capital stood at about $4 billion and loans outstanding stood at $24 billion. 2/ Total Export-Import Bank loans to finance ships during 1966-77 are summarized below (in millions of dollars): 3/

1/ Japan Development Bank, Annual Report, 1983, 1984.

2/ The Export-Import Bank of Japan, The Export-Import Bank of Japan: Its Role and Function, 1983.

3/ U.S. Department of Transportation, Maritime Administration, The Maritime Aids of the Six Major Maritime Nations, 1977, based on data contained in the Handbook of Shipping Statistics, Ministry of Transport.

Year	New loans
1966	449
1967	487
1968	451
1969	603
1970	706
1971	710
1972	710
1973	510
1974	327
1975	241
1976	711
1977	823

The main credit instruments that benefit the shipbuilding industry are export suppliers' credits and buyers' credits. Generally, the financing terms of Japan's Export-Import Bank loans follow the OECD Understanding on Export Credits for Ships. 1/

Export suppliers' credits.--The Export-Import Bank of Japan extends export suppliers' credits to shipbuilders to finance foreign sales that are made on a deferred payment basis. The Japanese shipbuilder that enjoys these credits can then grant deferred payment to foreign ship owners on the same conditions as it receives. In 1982, the share of deferred payment-based contracts in total Japanese ship export orders was 32 percent (on a gross ton basis) compared with 52 percent for the preceding year. 2/

Currently, export suppliers' credits cover 38.5 percent of the total price. The term of the loan is 8.5 years after completion of the ship. Interest rates are approximately 8.0 percent. A minimum downpayment of 20 percent of the export contract is required. Normally, a letter of guarantee issued by a major bank or a Government guarantee should cover the unpaid balance of the down payment and the deferred payment portion of the contract amount, but in the case of ship exports, first mortgages are accepted. Export Proceeds Insurance from the Ministry of International Trade and Industry is

---

1/ The Working Party of six of the OECD is an organization which aims to maintain fair and orderly competition between the world's shipping industries. The Working Party has reached consensus on a number of shipbuilding related matters including the "Understanding on Export Credits for Ships," in 1969; the "General Arrangement on the Progressive Removal of obstacles to normal competitive conditions in the Shipbuilding Industry," in 1976. Those agreements have been revised periodically in response to changed global conditions. The general guidelines contained in these commitments are outlined in the EC section, later in this report.

2/ In terms of value, the share of deferred payment-based contracts in total Japanese ship export orders accounted for 35 percent compared with 51 percent a year earlier. Japanese Ministry of Transport, Shipbuilding in Japan, 1982-83.

also required. 1/ The bank requires the assignment of Export Proceeds Insurance as collateral.

Prior to 1968, the terms available for export orders were even more favorable. However, since 1968 the percentage of the ship's price covered by the Export-Import Bank has decreased while the interest rates on those loans have increased. 2/ In fiscal 1983, the Bank made 46 commitments, totaling 67.3 billion yen ($300 million) for ship-exporting credits, a decrease of 30 percent from the previous year. 3/

Buyers' credits.--The Export-Import Bank also extends buyers credits to foreign importers and foreign financial institutions to finance their imports of Japanese equipment and technical services. In 1983, the bank made 52 commitments amounting to 120 billion yen ($536 million) under this program, a decrease of 56 percent from 1982. 4/

Other credits and guarantees.--Japanese shipbuilders may also benefit from other Export-Import Bank loans, such as technical service credits, import credits, and overseas investment credits/overseas project loans. Export-Import Bank guarantees are also available to domestic corporations for their liabilities incurred in connection with loans from other sources and to Japanese private banks for their participation in the Bank's direct loans to foreign entities.

The Maritime Credit Corporation.--The Maritime Credit Corporation (MCC) was established in 1959. Its main purpose is to implement the Government's scrap-and-build program for coastal shipping operations. Under the scrap-and build program, ship owners are required to scrap an old vessel if they wish to

---

1/ The Ministry of International Trade and Industry operates insurance schemes to provide protection against the risks associated with exports or other international transactions. In cases such as exports of plants, ships, and technical services, export proceeds insurance is provided when export bills are settled on a deferred payments basis or Japanese banks provide foreign importers with buyers credits in conjunction with the bank.

2/ U.S. Department of Transportation, Maritime Administration, The Maritime Aids of the Six Major Maritime Nations, November 1977, p. II-51.

3/ The Export Import Bank of Japan, Annual Report for Fiscal 1983, p. 9.

4/ Ibid., p. 11. A breakdown by type of export is not available.

gain Government permission to build a new coastal ship. 1/ The MCC provides long-term, low-interest loans and loan guarantees to companies involved in coastal shipping. MCC co-owns ships that are newly built with credit provided by MCC. The operation of the ship is in the hands of the shipping company, which ultimately buys MCC's ownership share. 2/ The repayment terms for MCC's loans are longer and interest rates lower than normally available in the market. The loan repayment schedule is fixed in accordance with the life of the ship provided in the law, e.g., in 1984, 15 years for vessels over 2,000 gross registered tons. There is a 2 to 3 year grace period before repayment must begin.

During 1961-81, MCC financed the construction of 1,177 vessels totaling 1,190,000 gross tons with a combined value of 231,400 million yen. During 1979-81, MCC financed 53 percent of the passenger boats built in Japan and 36 percent of the freighters built in Japan. In 1984, MCC provided 43.2 billion yen in loans to Japan's coastal shipping companies, as follows (in millions of yen): 3/

Purpose	
For building and reconstruction of passenger boats	10,400
For building domestic freighters	25,300
For building international near-seas freighters	6,800
For remodelling domestic freighters	700
Total	43,200
Liabilities guaranteed	4,000

Tax benefits.--Japanese ship operators and shipbuilders benefit from a number of special tax provisions, particularly accelerated depreciation of

---

1/ The scrap-and-build program is administered by the Japan Federation of Coastal Shipping Associations (JFCSA). Owners who wish to build a new ship apply for approval to the JFCSA, which weighs the necessity of constructing the particular ship. The permissable level of ship construction is determined by taking into account the Ministry of Transport's annual guideline on appropriate fleet tonnage and also with reference to data which have been obtained through JFCSA's own surveys and analyses. Currently, the required rate of scrapping against one dwt of new building of dry cargo ships has been set at 1.5 dw/t against 1 m3 of new tanker at 1.1 m3. Such high scrapping rates are necessary because the volume of cargo carried by coastal ships has declined. The reason for setting a lower scrapping rate for tankers than for dry cargo ships is that a joint scrapping project is underway in the tanker field to eliminate overtonnage. In the joint scrapping project, 8,000 m3 of tankers were scrapped in 1982 and more tankers were being scrapped in 1983 with the target set at 10,000 m3. Under this project, JFCSA buys ship owners replacement rights so that the tankers to be scrapped cannot be replaced with any other ships. As for the financing to purchase the replacement rights, JFCSA borrows money from financial institutions, and collects contributions from ships in operators at an equal rate to repay the loan and interest.

2/ It finances purchases of conventional passenger boats, cargo and passenger boats, car ferrys, high speed passenger boats, conventional cargo boats, oil tankers, chemical tankers, cement carriers, international near-seas freighters, and waste disposal ships. Financial assistance is also provided for ship repair and retrofitting.

3/ Maritime Credit Corporation, October 1984.

purchases of new plant and equipment and tax-free reserves for particular types of business expenses. Japan's tax policies act to moderate the effects of cyclical changes in business performance because they allow companies to lower their taxable income in profitable years via accelerated depreciation and tax-free reserves, while cushioning them during cyclical downturns. They also encourage the rapid diffusion of new technologies throughout the Japanese economy.

Accelerated depreciation.--Ship operators are allowed to claim accelerated depreciation for purchases of specific types of ships. In addition to ordinary depreciation, firms that buy designated equipment may deduct a specified share of the equipment's cost from their taxes in its first year of use. For example, purchasers of ships weighing 2,000 grt or more can take an additional 15 percent of the original cost of the ship as a depreciation expense during the first year of the ship's operation. Shipbuilder's also benefit from accelerated depreciation provisions. The equipment eligible for accelerated depreciation is generally the most advanced available, reflecting the Government's desire to rapidly diffuse the most up-to-date technology throughout the industry. 1/ Shipbuilders have particularly benefited from accelerated depreciation on computers, computer aided design equipment, robots, and other sophisticated equipment. Some shipbuilding enterprises may also claim additional depreciation, equaling 10 percent of the value of the capital investment required in the conversion of their production to different products such as oil rigs and heavy machinery.

Accelerated depreciation gives substantial incentives to Japanese purchasers to buy designated equipment. During 1980-82, purchasers of computerized, numerically controlled machine tools, computer aided design equipment, remote computer terminals, and industrial robots received an extra 13 percent depreciation allowance for the first year the equipment was in operation. The tax savings due to this provision were estimated by the U.S. International Trade Commission in 1983 to equal approximately 6.2 percent of the equipment's value. 2/

The Japanese Shipowner's Association has asked the Government to improve and extend the special depreciation system for ships, which is due to expire in March 1985. Specifically, it requested that additional appreciation rates be applied to modernized ships. The Association is also seeking a 2-year extension of the depreciation period by another 2 years. The changes have yet to be approved by the Japanese Government.

Tax free reserves.--Both shipbuilders and ship operators are allowed to set aside tax-free reserves for a number of purposes. These reserves are then brought back into the taxable income stream over an extended period. Tax free reserves can be set aside for replacement of specific business assets (including ships and shipbuilding equipment) and for ship repairs. Operators

---

1/ Statement of Allan Mendelowitz, General Accounting Office on "Japanese Tax Incentives to Save and Invest" before the Joint Economic Committee, Sept. 24, 1984.

2/ U.S. International Trade Commission, Foreign Industrial Targeting and Its Effects on U.S. Industries, Phase I: Japan, October 1983, p. 76 and Appendix C.

may also set aside 0.1 percent of the revenue accrued from tanker operations as a tax free reserve. Until 1972, the Government also used the tax system to encourage firms to export. During the 1950's and early 1960's, additional depreciation deductions could be taken for strong export performance. Criticisms from the GATT in 1964, however, forced Japan to change this system to a 5-year income deferral scheme. 1/

Antitrust policies.--The Government has consistently encouraged mergers--using tax incentives and other means--and allowed joint activities, such as production cut backs, price stabilization measures, and scrapping programs, to dampen what it terms "excessive" competition by Japanese shipbuilding and shipping firms. Following are examples of the Japanese Government's efforts to stabilize prices and rationalize the maritime sector.

1964: Organizing the shipping industry around six "core" firms.--In the face of a protracted slump in the global shipping market in the mid-1960's, the Japanese Government reorganized ship operators, merging 12 major shipping firms into 6 "core" companies, and organizing a total of 95 companies around these "core" firms. Detailed Government regulations were also placed on the management of the "core" firms. Immediately after the regrouping, the firms involved owned more than 80 percent of the total tonnage of the Japanese flag merchant fleet. (Their share is currently about 60 percent of the tonnage.) 2/ Sanko Steamship was the only major Japanese shipping company to resist Government pressure on the industry to restructure. 3/

1978-83: Joint operating cut-backs, scrapping activities, and pricing guidance for shipbuilders.--The shipbuilding industry was one of eight industries designated by the Japanese Government in a 1978 law as "structurally depressed". 4/ The purpose of the law is to help industries adjust to a rapid decline in demand for their products or a sudden loss of competitiveness. As a designated industry, it became eligible for financial assistance and extended unemployment benefits. The industry also applied for, and received, permission to form a depressed industry cartel, allowing it to engage in joint activities such as joint capacity cutbacks, minimum pricing agreements, and production coordination. 5/

1/ Specifically, two tax measures were used between 1964 and 1972 to encourage exports: basic accelerated depreciation and supplemental depreciation. The basic accelerated rate was computed, based on the proportion of exports to total sales multiplied by a stipulated percentage, which varied between 80 and 100 percent. The supplemental accelerated depreciation allowance was intended to reward incremental improvements in export performance; allowances were based on a comparison of export sales in the present and preceding accounting periods. The supplemental depreciation measure could allow an increase of between 30 and 60 percent over the deductions allowed under basic accelerated depreciation. Both of these provisions were discontinued by 1972. Ibid, p. 75.

2/ Shigeya Goto, Director, Japan Maritime Research Institute, "Remarks before the Pan-Pacific Sister Ports Seminar II, Yokohama Japan, May 31, 1984" as reprinted in Ports and Harbors, October, 1984, pp. 18-23.

3/ Far Eastern Economic Review, July 7, 1983, p. 46.

4/ (It was so designated on Aug. 29, 1978).

5/ U.S. International Trade Commission, Foreign Industrial Targeting and Its Effects on U.S. Industries, Phase I: Japan, Washington, D.C., 1983, pp. 115-122.

The Ministry of Transportation also issued "administrative guidance" (a "recommendation" to firms issued under the authority of the shipbuilding Law of 1950) to shipbuilding firms calling for them to raise prices or reduce output by a set amount. Firms were also encouraged to cut production on several occasions. Though firms were not formally compelled to follow Government guidance, the Government's ability to issue new shipbuilding permits, export permits, and its control of orders made under the planned shipbuilding program are likely to influence a firm's decision on whether it will comply with Government guidance. Many firms have, however, ignored Government guidance at one time or another. If the Government meets sufficient resistance by the affected firms, it usually changes the guidance to reflect these concerns.

Research and development assistance.--The Japanese Government frequently organizes research and development projects on subjects of importance to the future competitiveness of particular industries. Japanese antitrust laws generally allow firms to form cooperative research associations to perform basic and applied research. 1/

The shipbuilding industry benefits from a number of these programs. The Ministry of Transport's Ship Research Institute, funded at 1.8 billion yen in 1979, conducts industry-related research. An advisory council to the Ministry, "The Council for Transport Techniques," makes regular studies on the problems facing the shipbuilding industry as well as suggestions about how Government-sponsored research can contribute to their solution. In 1983, the Council recommended that the Ministry concentrate on supporting research on robotization of the shipbuilding process, computerization of ship controls, and basic technologies for new energy-using engines and ships using superconducting electromagnetic thrust systems. Firms and private cooperative associations wishing to do such research are eligible for direct grants, low- or no-interest loans, and personnel and equipment support from the Government.

Export promotion.--The Government's most important export promotion program for the shipbuilding industry is low-cost Export-Import Bank loans, described above. In addition, Japanese shipbuilders have formed an export association under the Antimonopoly Law. Such associations can engage in market research and joint marketing efforts in foreign sales. 2/

Impact of Government policies.--The support measures provided by the Japanese Government were crucial to the initial development of Japan's shipbuilding industry in the 1950's, helped sustain its growth into the 1960's, and underpinned growing export sales through the 1970's. They also came into play when the industry faced severe overcapacity problems in the mid-1970's and have encouraged diversification of product lines and internationalization of production into the 1980's.

Because of the growing crisis in the shipbuilding industry, the Government adopted a special plan for the rationalization of Japan's shipbuilding industry in 1978. The plan called for closure of some firms,

---

1/ For a detailed description of the types of activities export associations can take part in, see U.S. International Trade Commission, Foreign Industrial Targeting and Its Effects on U.S. Industries, Phase I: Japan, Washington, D.C., October 1983, pp. 115-122.

2/ Ibid.

capacity cutbacks in others, scrapping of Government ships ahead of schedule, and export of excess ships to developing countries as a form of foreign aid. A reorientation of the industry towards building floating factories (whole plants), offshore oil-drilling equipment, and LNG tankers was also called for. Government loans and other financial assistance were used to underwrite this rationalization scheme.

The principal recommendation of the plan was for a cutback in shipbuilder's operating ratios by more than 35 percent and for ultimate scrapping of the excess facilities. Despite opposition, the proposed rationalization plan went into effect in 1979, with capacity cutbacks to be completed by March 1980. Sixty-one firms participated in the plan, the impact of which fell disproportionately on the larger firms. These were integrated heavy machinery makers that were seen as being able to transfer resources into other divisions and to quickly diversify their product offerings. However, these large firms were also the most efficient suppliers. 1/

The Government adopted several measures to help smaller firms accomplish the objectives of the plan. The Ministry of Transport set up the Designated Shipbuilding Enterprises Stabilization Association which purchased nine shipyards, with a total aggregate building capacity of 490,000 compensate gross registered tons (CGRT), at a cost of 36.8 billion yen. To finance these purchases, the Association obtained funds from the Japan Development Bank and various commercial banks and raised 2 billion yen--half from the Government and half from the large shipbuilders. The money received through the resale of land, facilities, and equipment was used to help pay back the loans. The remainder of the repayment was provided by all of the companies involved in the cutbacks, including the seven major companies.

Special financial measures were also provided to small- and medium-sized shipbuilders to assist them in disposing of surplus building facilities. The seven major companies were to jointly provide the funding and guarantee the loans extended through the Special Depressed Industry Fund. 2/ Loans were also available from the Japan Development bank for up to 50 percent of the funds required for capital investments by firms shifting their resources into production of different equipment. 3/

The Government also established the Depressed Industries Credit Fund in July 1978. The Fund, whose creation was authorized under the Structurally Depressed Industries Law, was used to guarantee private loans to depressed industries. These guarantees were considered necessary because long-term loans normally require plant and equipment as collateral, which would hinder the companies' scrapping efforts. 4/ This Fund underwrote nearly 10 billion yen in capital investments and guaranteed nearly 100 billion yen in adjustment loans. The shipbuilding industry accounted for nearly two-thirds of the guarantees made by the Fund.

1/ Wheeler Pepper and Janow, op cit. p. 168-9.

2/ Wheeler, et al., p. 169.

3/ U.S. Department of Transportation, Maritime Administration, Maritime Subsidies, February 1983, pp. 82-83.

4/ U.S. General Accounting Office, Industrial Policy: Case Studies in the Japanese Experience, October 1982, p. 64.

A series of measures were also taken to expand domestic demand for ships. The Government accelerated the replacement schedule for Government-owned vessels. The value of ship orders placed by the Defense Agency and the Maritime Safety Agency totaled about 104 billion yen in fiscal year 1977, and reached roughly 137 billion yen in fiscal year 1978. 1/

The Government also introduced a program to encourage the scrapping of existing ships through subsidies financed by the Government and the private sector. The Ship Disposal and Scrapping Promotion Association was set up in December 1978 to provide subsidies for the disposal of ships of 2,500 gross tons or over and for the scrapping of uneconomic ocean-going vessels. Four million grt of ships were slated to be scrapped from December 1978 to March 1983 under this plan. 2/

The above measures proved insufficient to close the supply-demand gap. As a result, the Ministry of Transport recommended that a number of the shipbuilding companies involved in the scrapping program adjust operating levels downward in fiscal year 1979 and 1980 to an average 39 percent of each company's peak year output. The 39 companies involved formed a recession cartel in August 1979 to carry out the reductions. The cartel arrangement was later extended for fiscal year 1981 (April 1, 1981-March 31, 1982). Under the extended cartel, output was to equal 51 percent of peak year output for the 35 participating companies.

The Transport Ministry also attempted to further boost demand. Under the Emergency Measures for Building Up Japan's Ocean-going Shipping Fleet (in effect during 1979-82), the Government decided to construct 3 million gross tons of new commercial ships. To meet that goal, the Government subsidized a portion of the interest payments on such loans for certain types of vessels, in addition to providing expanded JDB financing.

Today, the industry has been removed from the "depressed" category, but this came after a loss of one-third of shipbuilding related jobs 3/ and more than 49 bankruptcies. 4/ Many of the remaining shipbuilders have stayed afloat by diversifying into whole plant exports, oil rig building and heavy equipment making. Indeed, the share of shipbuilding, remodeling, and ship

---

1/ U.S. Department of Commerce, Maritime Administration, Maritime Subsidies, January 1981, p. 95.

2/ U.S. Department of Transportation, Maritime Administration, Maritime Subsidies, February 1983, p. 81. Employment in Japan's shipbuilding industry declined by 36.8 percent from 1974 to 1979. In an effort to ease worker adjustment, private firms made efforts to retrain and relocate workers and the Government instituted employment adjustment programs to aid workers in depressed industries. The law for Temporary Measures for the Unemployed in Designated Depressed Industries and the Law for Temporary Measures for Unemployed in Designated Depressed Districts were passed in 1978. These two laws provide workers with more extensive unemployment insurance and retraining and relocation allowances than generally applied to unemployed workers.

3/ General Accounting Office, Industrial Policy: Case Studies in the Japanese Experience, 1982, p. 65.

4/ Wheeler, Pepper, and Janow, p. 170.

repairs in the total sales of the seven major builders was 91 percent. 1/ They have also begun to internationalize production and to engage in technology sharing and coproduction agreements with foreign companies.

In the meantime, prospects for shipbuilders in Japan and in the rest of the world have not improved. Most shipyards in Japan have enough work for the next 2 years, but they are far from being assured of steady business. Japan also faces intensified criticism by the European shipbuilding industry. Japanese builders gained a 50-percent share of new ship orders in 1983 and nearly 70 percent in the first quarter of 1984. In response to those pressures, the Japanese Government has strengthened price checks in order to stop local builders from gaining new orders through low prices. Meanwhile, medium-sized firms are increasingly vocal in their opposition to current policy. The restrictions on plant expansions have kept them from moving into production of containerships and large tankers.

It seems clear that Japan's shipbuilders will be a major force in the world shipbuilding industry for some time to come. However, Government policies may have prevented some firms, particularly small builders, from making sufficient investments in new equipment. Furthermore, because large firms were forced to make disproportionate cutbacks in building capacity and were encouraged to diversify into other product lines, Japan lost some of the output of its most efficient firms in favor of more costly output by smaller yards. Meanwhile, restrictions on movements by medium-sized builders into more sophisticated shipbuilding operations kept them dependent on production of relatively old vessel designs. Therefore, the Japanese industry as a whole may be less competitive today than it would have been if adjustments had been left to the market forces, but employment in the industry is probably higher than it would have been under such a scenario.

South Korea

Industry profile

Until the late 1960's, Korea's shipbuilding industry produced only fishing vessels and coastal ships for domestic use. 2/ In the 1970's, the Korean Government targeted shipbuilding for export development because it consumes relatively little energy and is labor intensive--an ideal match for Korea's limited natural resources and abundance of inexpensive, skilled labor. Korea entered the world shipbuilding market at a fortunate time because its competitors from abroad were in a state of decline. On the other hand, Korea was handicapped by a low level of technology, a high import dependence on intermediate goods, and a shrinking market for ships. 3/

Eleven Korean shipbuilding firms build ships over 1,000 grt, and two (Hyundai Mipo Dockyard Co. and Busan Dockyard Co.) repair ships this size. Korea is heavily dependent on its top four shipyards, which account for 95 percent of production capacity. The tabulation below lists Korea's major

---

1/ Japanese Ministry of Transport, Shipbuilding in Japan, 1982-83.
2/ "Shipbuilding in Korea," Marine Engineering Log, November 1984, p. 74.
3/ "The Shipbuilding Industry in Korea," Monthly Review, June 1984, pp. 112.

shipyards and their share of total production, according to the Korean Shipbuilding Association (in percent):

Company	
Hyundai Heavy Industries	56
Daiwoo Shipbuilding and Heavy Machinery Ltd	28
Korea Shipbuilding and Engineering Corp	7
Samsung Shipbuilding and Heavy Industry Co	4
Daedong Shipbuilding Co	2

Korea's medium-sized firms are shown in the following tabulation. 1/

Company	Location
Korea-Tacoma Marine Industries	Mason
Daedong Shipbuilding	Pusan
Daesun Shipbuilding and Engineering	Pusan
Shin-A	Chungnu
Inchon Engineering and Shipbuilding	Inchon
Busan Dockyard	Busan (Pusan)

Figure C-1 shows the location of the major shipbuilders and ship repairers. These ship-repair yards also constitute the remaining 5 percent of Korean production of commercial ships.

The majority of Korean shipyards remain at the level of elementary technology of the 1970's. Certain shipbuilders, however, have adopted computer welding (on one side) and numerical contract bending in plate processing. Robot welding and laser-cutting are widely used, but CAD/CAM has not been acquired. Improvements have been made in the use of computerization in working processes management, manpower and materials management, and cost-benefit analysis, but management is still lagging behind.

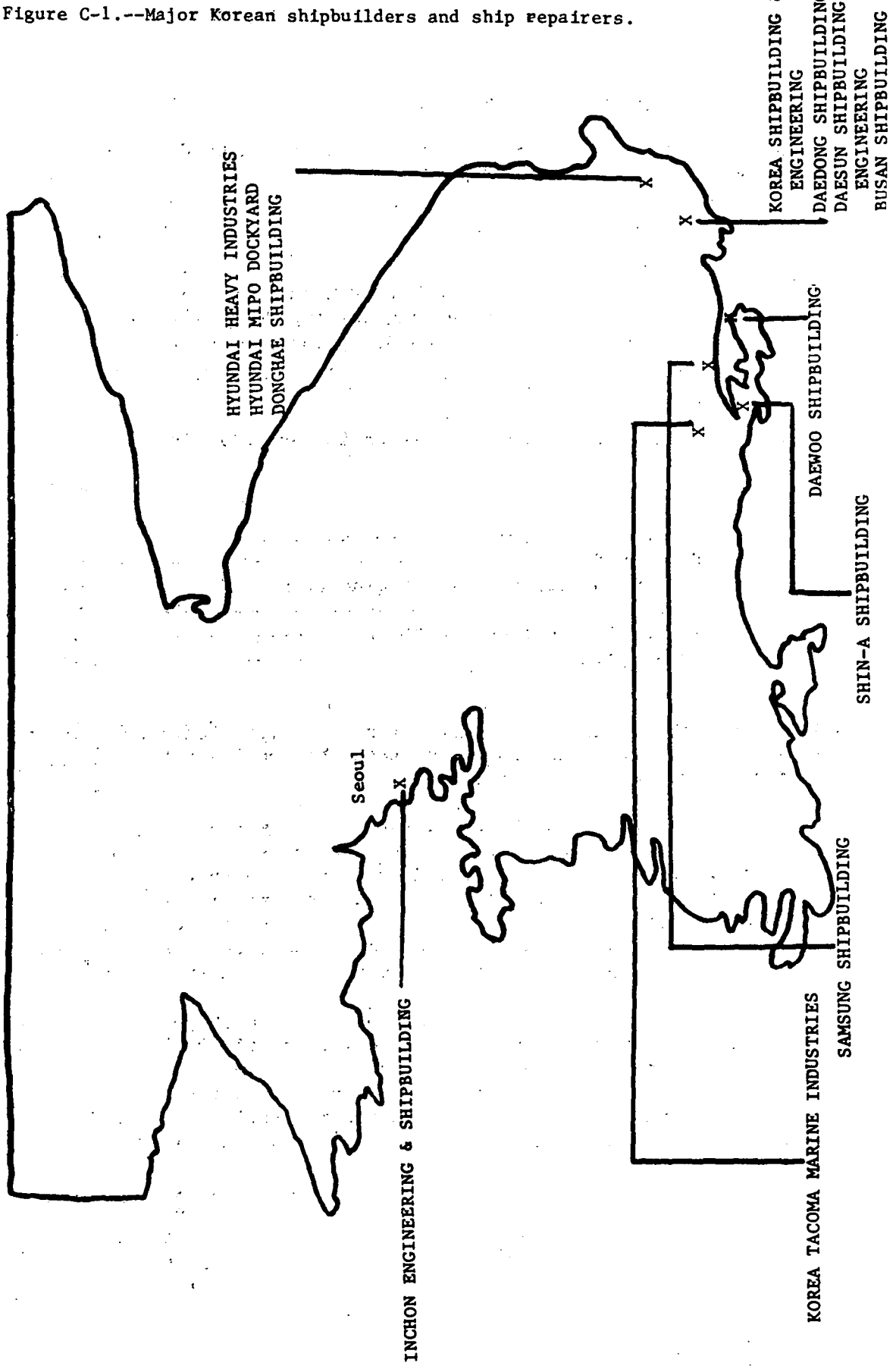
The total number of workers employed in the shipbuilding industry increased by 34 percent from 38,700 in 1980 to 51,700 in 1981 (table C-8). Total employment increased again by 22 percent between 1981 and 1982 and then only slightly in 1983. Production workers averaged 92 percent of total employment during 1981-83. The hourly compensation for employees of Korean shipyards is shown in the following tabulation (in dollars). 2/

1979	$1.87
1980	1.82
1981	2.16
1982	2.36
1983	1/
1984	1/

1/ Not available.

1/ "Shipbuilding in Korea," Marine Engineering/Log, November, 1984, pp. 75-9.
2/ U.S. Department of Labor, Bureau of Labor Statistics, April 1984.

Figure C-1.--Major Korean shipbuilders and ship repairers.



Source: Korean Shipbuilders Association.

Industry sources indicate that by turning to other than vessel construction, Korean shipbuilders hope to avoid layoffs if a long slump in the market develops. South Korea's shipbuilding employees are organized according to the Japanese paternalistic model. The shipbuilding company provides housing, food, and other benefits within close proximity to the yards. Strict regimentation also contributes to labor productivity. 1/

Table C-8.--Employment of all workers and production workers in Korea's shipbuilding and ship-repair industries, 1979-83

(In thousands)

Item	1979	1980	1981	1982	1983
All employees	37.5	38.7	51.7	64.7	65.0
Production workers	1/	1/	47.8	59.5	59.8

1/ Not available.

Source: Compiled from data provided by the Korean Shipbuilders Association.

The number of engineers in Korea's shipbuilding industry has increased each year and accounted for 15.4 percent of total employees in 1983. However, this rate lags that of most of Korea's foreign competitors. 2/

The Government has been responsible for much of the research and development investments, with the work being performed in research institutions or shipbuilding companies. Progress is expected to continue in developing energy and manpower saving vessels. 3/

As the tabulation below indicates, capital expenditures for land, buildings, and equipment rose by 58 percent, from $1.2 billion in 1979 to $1.9 billion in 1983 (in millions of dollars): 4/

Year	Expenditure
1979	1173
1980	1240
1981	1200
1982	1512
1983	1866

The financial stability and liquidity of Korean shipbuilders has declined because of these expenditures, but profitability has improved because of

1/ "South Korean Shipyards Forced to Shelve Expansion Plans", Financial Times, Dec. 5, 1984, p. 7.

2/ "Daewoo Marshall's Its Shipbuilding Troops With Military Precision", Asian Wall Street Journal, week of 1/31/83, p. 1.

3/ "The Shipbuilding Industry in Korea," Korean Exchange Bank Monthly Review, June, 1984, pp. 7-8.

4/ Data provided by the Korean Shipbuilders Association.

increased ship orders. 1/ Data in the following tabulation indicate net sales rose by 282 percent from 1979 to 1983 (the latest year for which data are available), but net income fluctuated during this period, according to the Korean Shipbuilders Association (in millions of dollars):

Year	Net sales	Net income
1979	691.5	(80.1)
1980	937.0	3.4
1981	1,712.2	40.5
1982	2,290.1	46.9
1983	2,638.2	43.1

Korean shipbuilding activity has followed a generally increasing trend during 1979-83. Construction rose from 525,193 grt in 1979 to 1.4 million grt in 1982. Production dropped 10 percent in 1983 to 1.286 million grt (table C-9).

Table C-9.--New construction in Korea's shipbuilding industry, by firms, 1979-83

(In gross registered tons)

Firm	1979	1980	1981	1982	1983
Hyundai	383,762	518,565	907,040	861,206	864,782
Daewoo	1/	1/	21,500	148,329	128,270
Korean Shipbuilding & Engineering Corp	103,060	60,448	137,655	186,988	129,573
Samsung	1/	13,858	52,000	126,000	73,400
All other firms	38,371	62,060	39,737	103,744	89,621
Total	525,193	654,931	1,157,932	1,426,267	1,285,646

1/ Not available.

Source: Compiled from data submitted by the Korean Shipbuilders' Association.

Although specific data are not available on the volume of repair work performed in Korean shipyards, industry analysts indicate that it has increased during 1979-84.

Overseas orders accounted for 3.8 million grt of total Korean new orders in 1983 compared with 1.1 million grt in 1979 (table C-10). Domestic new orders also increased during this period. However, domestic demand is still not strong enough to support Korea's shipbuilding industry. Exports of maritime products, by type, are shown in table C-11.

1/ Op.cit., Korean Exchange Bank Monthly Review, p. 9.

Table C-10.--New orders, domestic and foreign, in Korea's shipbuilding industry, 1979-83

(In gross registered tons)

Item	1979	1980	1981	1982	1983
Orders for export ships	1,064,608	1,431,521	1,490,330	1,206,222	3,828,577
Orders for domestic ships	138,809	258,622	362,618	148,280	269,625
Total	1,203,417	1,690,143	1,852,948	1,354,502	4,098,202

Source: Compiled from data submitted by the Korean Shipbuilders' Association.

Table C-11.--Commercial ships: Korean exports, by types, 1979--83

(In thousands of dollars)

Item	1979	1980	1981	1982	1983
New vessels	411,195	440,542	885,315	1,983,073	1,826,327
Refitted ships	78,300	161,293	408,121	703,746	1,542,567
Yachts	6,411	8,560	2,108	1,150	598
All other	23,556	7,230	108,930	143,260	365,223
Total	519,462	617,625	1,404,474	2,831,229	3,734,715

Source: Compiled from data submitted by the Korean Shipbuilders Association.

Government involvement

The Korean Government exercises considerable control over the development of its domestic industries through comprehensive planning. The five-year economic development plans (started in the 1960's) provide guidance for industrial growth and specify development goals and objectives. Projects approved in these plans are generally implemented by the private sector with loans or grants supplied through Government aid dispersed through the financial system.

Government aid to the local shipbuilding and ship-repair industries is closely tied to state plans for overall development for the economy. 1/ This aid is tailored to identified needs of the country and to the firms and organizations engaged in maritime activities.

Government planning to develop maritime industries.--The Maritime Transportation Promotion Act of 1967 was enacted to provide financial

1/ The Economist Intelligence Unit, EIU Report: Aids to Korean Shipbuilders, London, May 1980, p.3.

assistance to both shipbuilders and domestic purchasers. 1/ The Act provides for overall development plans for the maritime transportation industry and financial and other incentives to firms in shipbuilding and related activities. Shipbuilding did not become a major industrial sector, however, until the mid-1970's when the Government began to emphasize its role as an export industry in the Third Five-Year Plan (1972-76).

Under the Third Economic Plan, the Government designated shipbuilding as one of six strategic industries because, among other reasons, it has extensive linkages with more that 50 other industries including steel, electronics, and chemicals. 2/ The other industries targeted for development by the 1972-76 economic plan were iron and steel, nonferrous metals, machinery, electronics, and chemicals.

Prior to the 1972-76 plan, the Korean Government promoted its maritime industry primarily through the provision of tax advantages, favorable access to credit, and laws governing entry into the industry. The Third Plan initiated a formal strategy for development of the industry and also introduced measures to develop the domestic shipping industry as a ready market for the output from Korean yards. 3/

In 1975, the industry was heavily dependent upon imported inputs, particularly steel products from Japan. Korea also lacked large-scale production facilities for such items as large marine engines, compressors, and other equipment necessary for ship construction. To help remedy this situation, the 1976-81 economic plan sought to improve the self-sufficiency ratio of the industry by expanding the steel-making and ship-plate-rolling capacity of the Pohang Iron and Steel Company (POSCO). (POSCO began production in 1973 with an initial capacity of over 1 million tons of crude steel, thus providing a foundation for improved self-sufficiency in the industry.) The Government also encouraged domestic production of marine components and engines. In 1981 the following targets were set for local manufacture rates (in percent): 4/

	1981	1983	1986
Domestic ships	70	85	90
Export ships	40	55	80

Goals established for the shipbuilding industry in the 1982-86 economic plan include: 5/

1/ Law No. 1895, promulgated Feb. 28, 1967; amended by Law No. 3146 on Dec. 5, 1978; amended by Law No. 3186 on Dec. 28, 1979; amended by Law No. 3365 on Feb. 4, 1981. Major provisions of the Act are discussed later in the financial assistance section.

2/ Korea Exchange Bank, Monthly Review, Dec. 1982, vol. 16, no. 12, p.1.

3/ See "Financial Assistance"section.

4/ Source: Taiki Yamamoto, "South Korea's Shipbuilding Industry Trying to Catch Up With World's Top," Kaiji Press, Apr. 8, 1982, no. 2, p.10.

5/ Ibid.

- o construction of new building and repair docks to be completed by mid-1980s;
- o increased productivity through technological development;
- o increased domestic production of marine components and engines;
- o increased Government assistance in securing orders by strengthening the export credit system; and
- o rationalization of the industry.

Government plans for the shipbuilding industry also include expansion of the country's ship repair capacity by investing 99.6 billion won to construct a 400,000 dwt, 300,000 dwt, and 250,000 dwt repair docks at Hyundai Mipo Dockyard and a 150,000 dwt dock at the KSEC yard in Busan. 1/ The 1982-86 economic plan also calls for expanding the country's shipbuilding capacity by 60 percent to about 6 million grt and increasing the tonnage of the merchant fleet by 15 percent from the current 6.2 million grt to 10 million grt in 1986. 2/

Research and development.--The Korean Exchange Bank recently noted that "success, as measured in terms of the quantity of ships produced, has detracted from the immediate need for resources to be diverted into improved and more sophisticated technology. Extensive investment by shipbuilders requires Government support. . . ". 3/ Reportedly, Korean yards are 30 to 40 percent less productive than Japanese yards and about 45 percent of total Korean shipbuilding costs are spent on importing sophisticated foreign electronics and navigation equipment for ships under construction. 4/

In response to the need for more R&D in the shipbuilding industry, the 1982-86 economic plan calls for increased technological development to improve productivity through: (1) educational training programs for design engineer products; (2) development of standard ships; (3) joint ventures with international corporations engaged in shipbuilding technology; and (4) establishment of design centers for medium and small shipbuilders. 5/

The Government currently provides engineering and design research and testing facilities at its research center in Daeduk Science Town and R&D assistance through the Government-supported Korea Institute of Machinery and Metals (KIMM). KIMM was established in 1981 for the purpose of developing technology pertaining to machinery, metals, and shipbuilding. 6/

1/ U.S. Department of Transportation, Maritime Administration, Maritime Subsidies, February 1983, p. 87.

2/ Ibid., p. 85.

3/ Korea Exchange Bank, Monthly Review, June 1984, vol. 18, No. 6, p. 11.

4/ U.S. Embassy, Seoul, cable, Aug. 4, 1984, p. 5.

5/ Yamamoto, op. cit., p. 12.

6/ Republic of Korea, Ministry of Science and Technology, Introduction to Science and Technology in the Republic of Korea, Seoul, 1984, p. 31.

Tax policies.--Tax incentives to promote the development of specific industries have been sharply reduced in Korea since 1982; however, the shipbulding industry is one of several industries permitted some tax benefits. Shipbuilders may take advantage of accelerated depreciation on assets and the value-added tax may be waived on some shipbuilding materials. Customs duties may also be waived on imported materials and components for shipbuilding, conversion, and ship repairs that are not produced domestically. 1/

Cartel and merger policy.--The Korean Government is offering its fiscally troubled shipping companies strong financial incentives to merge over the next 2 years. The Shipping Industry Rationalization Plan (SIRP) aims to merge the 69 national shipping companies into 20 financially sound principal carriers. 2/ Companies that comply with the voluntary plan will be eligible for exemptions from registration and value-added taxes. Additional benefits include deferred payment on newly procured ships and temporary operating subsidies.

SIRP companies will also be eligible for an increased grace period on loans involving domestic currency from 2 1/2 to 5 years and subsidy funds for interest repayment. Special loan support for principle and interest repayment is also offered for transactions involving foreign currencies. 3/ In addition, the Korean Government plans to make a $42 million fund available to enable shipowners to convert inefficient tonnage into energy- and manpower-conserving ships. 4/

Companies that choose not to participate in the SIRP plan will find it difficult to compete efficiently with those who do. As of March 1984, 62 of the 69 national shipping companies had expressed their intention to participate in SIRP. 5/

The Korean Government has encouraged more cooperation among the major shipbuilders, Hyundai, Daewoo, KSEC, and Samsung, by tentatively urging them to consult with each other more to avoid destructive price wars. 6/ Moreover, the marine engine industry was rationalized under the preceding 5-year economic plan. Under the rationalization scheme, Ssangyong Heavy Industry was encouraged to specialize in diesel engines of less than 6,000 horsepower (hp) and Hyundai Engine Manufacturing was encouraged to produce only diesel engines larger than 6,000 hp. 7/

Subsidies/financing policies.--The Korea Development Bank (KDB) was established in 1954 to supply long-term credit for major industries. KDB loans are concentrated in major industries designated by the Government,

---

1/ U.S. Dept. of Transportation, Maritime Administration, Maritime Subsidies, p. 86.

2/ Seatrade, "S. Korea Report", April 1984, p. 83.

3/ American Shipper,"Korea Weeding Out Weak Lines," March 1984, p. 8.

4/ Maritime Subsidies, op. cit., p. 87.

5/ Hur Kim, "Mergers main hope for ailing shipping industry," The Korea Herald, Mar.21, 1984, p.7.

6/ Far Eastern Economic Review, "Industrial South Korea," July 19, 1984, p. 48.

7/ Korea Exchange Bank, op. cit., p. 7.

namely: shipbuilding, electric power production, iron and steel production, and coal mining. KDB services include long-term loans to finance the acquisition of equipment and machinery for which other sources of finance are unavailable, repayment guarantees on foreign and domestic loans, underwriting and subscribing to corporate bonds issued to finance major projects, and working capital loans. 1/

The National Investment Fund (NIF) was established in 1974 to provide the investment and loan funds needed to promote the development of major industries. KDB administers the Fund in accordance with goals established in the 5-year economic plan. As shown in table C-12, from FY 1978 through FY 1983 the proportion of NIF loans to shipbuilders under the Government-supported shipbuilders program (described below) increased significantly.

Table C-12.--Korean National Investment Fund loans for shipbuilding, fiscal years 1975/76 to 1983/84

Fiscal year	Amount	Percent of total loans
	Million won	
1975	6,027	4.9
1976	5,870	3.3
1977	19,660	8.2
1978	24,179	6.4
1979	32,334	7.4
1980	54,584	12.5
1981	96,616	15.9
1982	122,792	16.8
1983	137,346	18.7

Source: Compiled from data supplied by the Bank of Korea, National Investment Fund Statistics: 1974-83.

Government-Supported Shipbuilding Program (GSSP).--The GSSP was established in 1975 as part of Government efforts to increase the amount of domestic ships built in Korean yards. 2/ At its inception, GSSP provided up to 90 percent financing for domestic ships built for the domestic registry at 12-13 percent interest. 3/ Since 1983, GSSP loans have been reduced to 80 percent of contract price with the following terms and conditions: the interest rate for a loan denominated in Korean won for a deep sea or coastal vessel is 10 to 11.5 percent. Repayment terms for the deep sea vessel is 13 years with a 5-year grace period and 8 years with 3 years grace for the coastal vessel. Loans denominated in U.S. dollars for a deep sea or coastal vessel have an interest rate based on London Interbank Offered Rate (LIBOR) and are repayable in a maximum of 10 years with a 4-year grace period.

1/ The Economics Intelligence Unit, op. cit., p. 8.
2/ Article 4 of Marine Industry Transportation Promotion Act.
3/ Seatrade, "S. Korean Report," April 1984, p. 101.

Since implementation, GSSP has been responsible for constructing 567 Korean ships, totaling 1.71 million grt, or about 25 percent of the country's fleet. 1/ About 30 billion won ($42 million) was allocated in 1984 for loans financing the conversion of older ships into energy-conserving vessels. 2/

"Encouragement" subsidies are available to international transporters who contribute significantly to foreign exchange earnings. When the Government grants these operating subsidies it reserves the right to demand the recipient company operate on a specific route for a fixed period. The Korean Government sustains any losses incurred from this service.

To be eligible for operating subsidies, a company must contribute significantly to foreign exchange earnings and have a minimum tonnage of 20,000 grt and a minimum capital of 500 million won. Joint ventures are eligible for the subsidies when the Korean share of the venture is at least 51 percent and Korean representation on the Board of Directors amounts to three-fifths of voting rights. 3/ Reportedly the Government will end the "encouragement subsidies" after fiscal year 1986. 4/

Export financing assistance.--The Korean Export-Import Bank (KEXIM) was established in 1976 to promote national development and economic cooperation with foreign countries by extending financial assistance for export-import transactions, overseas investment, and overseas resources development.

Foreign shipowners or Korean exporters can receive KEXIM loans for up to 56 percent of ship cost at 9 percent interest with repayment over 8 years including a 2-year grace period. Cofinancing from other banks for up to 24 percent (resulting in total financing of 80 percent) is repayable over 5 years at an interest rate based on LIBOR. 5/

To date, shipbuilding has accounted for most of the following KEXIM financing: 83.8 percent of total loan disbursements in 1980; 91.5 percent in 1981; 88.2 percent in 1982; 79.9 percent in 1983; and 89.3 percent in January to October 1984. 6/ However, KEXIM has recently suggested it plans to divert more of its resources to other export industries thereby decreasing its involvement in shipbuilding. In accordance with there plans, KEXIM will no longer grant the 2-year moratorium on shipbuilding loans and the interest rate will increase from 9 percent to 10 percent for contracts negotiated after 1984. 7/

Other policies and assistance.--Licenses to import vessels into Korea are restricted in such a way as to protect the local industry. Since 1977, the import of newly built ships has been "banned in principle" and all new ships built for the Korean merchant fleet must be built at domestic yards, except

---

1/ Seatrade, "S. Korean Report," April 1984, p. 101.
2/ Ibid.
3/ U.S. Department of Transportation, Maritime Administration, World Government Aid to Shipbuilders and Shipowners, March 1984, p. 23.
4/ Republic of Korea Government.
5/ U.S. Department of Transportation, op. cit., p. 86.
6/ Government of the Republic of Korea.
7/ World Government Aid to Shipbuilders and Shipowners, op.cit., p. 24.

where not possible for technical or delivery-time reasons. 1/ For those vessels that are imported, there are no customs duties levied on steel cargo vessels or passenger transport vessels less than 10 years old and over 3,000 grt. A 5-percent duty is levied on tankers and cargo vessels between 1,500 and 3,000 grt and less than 10 years old; a 10 percent duty is levied on other vessels. 2/ The duties on smaller ships is 20 percent for those items less than 10 years old and 30 percent for older ships. 3/

The Korean Congress recently passed a measure designed to reserve certain bulk cargoes for Korean flag ships. Under the bulk cargo reservation scheme, cargoes determined by the Government as having an important influence on the national economy must be carried on Korean ships. These cargoes, designated as "strategic," cover such imports as crude oil, iron ore, fertilizers, grains, Government procurement materials, coal, petrochemical, and such export items as plywood, cement, and steel products. 4/ Exemptions may be granted where the cargo is committed to a foreign carrier under international agreement or where a Korean ship is not available. 5/

In addition to the bulk cargo reservation system, Korean shippers receive preferential treatment under a waiver system that theoretically reserves all liner cargoes for Korean ships. 6/ Exemptions are for foreign ships belonging to a country that has a bilateral shipping agreement with Korea (e.g., the United States, Singapore, and Denmark) or that belong to a Conference in which Korean lines are also members. 7/ Korea has since ratified the UNCTAD liner code and has reduced the scope of the waiver system.

Impact of Government policies.--The Korean shipbuilding industry has been heavily promoted by the Government for strategic and economic reasons and is an example of successful development planning serving both import substitution and export promotion goals. Domestic shipyards have received a high level of Government support in the past, both in priority access to domestic credit and in guarantees on foreign borrowing. Government intervention assisted the Korean industry in becoming the second largest shipbuilder in the world, accounting for 21 percent of total world orders in 1983.

1/ U.S. Department of Transportation, Maritime Administration, Maritime Subsidies, Febuary 1983, p. 87.

2/ The Economic Intelligence Unit, op. cit. p. 16.

3/ Ibid.

4/ "S. Korea Plans Bulk Cargo Reservation," Seatrade, July 1984, p. 39.

5/ The waiver system was initiated in 1952 and, following revisions in the 1960's, a new waiver regulation was enforced in August 1979. See "Regulation for Adjustment of Cargo Carriage by Korean Flag Vessels," Ministry of Transportation Notice No. 636, and Korea Maritime and Port Administration Notice No. 209, "Guideline for Adjustment of Cargo Carriage by Korean Flag Vessels." Government of the Republic of Korea, Korea Maritime and Port Administration.

6/ Government of Republic of Korea.

7/ Op. cit., "S. Korea Plans Bulk Cargo Reservations," p. 39.

People's Republic of China

Industry profile

In the 1920's, China started building 10,000 grt ships for export, but the economy declined and shipbuilding had almost disappeared by 1949 when the People's Republic was established. At that time, the Government received support from the Soviet Union to construct new shipyards and to modernize existing capacity, but these efforts were not successful. During the period 1958-69, the Government discouraged imports of necessary technology to produce hulls and other related ship equipment through its policy of self-reliance. Even though construction time was reduced and some new technology was developed domestically, the industry generally stagnated during this period. Starting in 1971, after the Cultural Revolution, China developed the capacity to build larger ships, shortened delivery time by 4 to 5 months, and made improvements in shipbuilding technology.

In 1978, China moved away from its policy of self-reliance. The Government also began to reorganize administrative functions for shipbuilding, which had become fragmented and complicated, delaying construction decisions. Drastic administrative reforms were instituted and the China State Shipbuilding Corporation (CSSC) was set up to handle a wide range of shipbuilding activities, including technical development planning, fabrication and repair to export and import, the introduction of overseas technology, and financing. In recent years, the shipbuilding industry grew so that by 1982, China was beginning to attract attention as a ship exporter. 1/

According to official Chinese statistics, there are more than 500 shipyards of all sizes in China. The China State Shipbuilding Corporation manages 26 of the major yards, 66 ship equipment plants and 33 research and design institutes. 2/ Of these yards, only eight can construct vessels of more than 5,000 grt. 3/ These major shipyards and their locations are shown in the following tabulation: 4/

Firm	Location
Dalian shipyard	Dalian
Jiangnam shipyard	Shanghai
Hudong shipyard	Shanghai
Zhonghua shipyard	Shanghai
Shanghai shipyard	Shanghai
Hongxing shipyard	Qingdao
Guangzhou shipyard	Guangzhou
Xingang shipyard	Tianjin

1/ "Building Ships for Export," China's Foreign Trade, 1982.
2/ "Far East Shipyards," Marine Engineering/Log, September 1983, p. 49.
3/ "Japan Ready to Fully Help China Modernize Shipyards," Japan Economic Journal, Sept. 4, 1984, p. 11.
4/ "The Chinese Shipbuilding industry: Current situation and prospects," China Newsletter, September-October 1983, p. 16.

The Shanghai shipyard, the largest of these centers, receives the majority of the industry's orders, with a high percentage coming from abroad. In 1981, as part of an attempt to give the shipbuilding industry some independence from Government control, the Shanghai shipbuilding operation was set up to oversee 10 shipyards, 9 mechanical engineering facilities, and 2 ship design institutes with a total workforce of 70,000. In order to increase production, Shanghai shipbuilding is in the process of initiating several new policies such as allowing the shipyards to retain all of their profits, to have greater autonomy from Peking in signing contracts with overseas buyers, and to compensate foreign suppliers for components after the ships are sold. 1/

Chinese shipyards are becoming increasingly competitive in the world market because of low prices, high quality, and quick delivery of ships. Two factors behind China's progress in shipbuilding are an abundant labor force and a history of shipbuilding technology. 2/ In 1983, the industry employed 73,500 persons in its 8 major shipyards. These workers earn an estimated one-twelth of the wages paid to Japanese employees for comparable work. Although there were initial concerns about the quality of their ships, the Chinese industry now has a reputation for building vessels that meet international technical standards with regard to design, construction, navigation safety, and pollution control. China also offers prices that are about 15 percent less than Japan and 10 percent less than Korea or the world average. 3/ Although the shipbuilding industries of Korea and Japan can sometimes undercut China's low prices, China can afford to lose overseas orders rather than match the competition, since it can fall back on its large domestic market. 4/ From 1986 through 1990, China's commercial fleet will need a large number of ships to replace its older vessels. CSSC has already signed contracts to produce 218 ships totaling 2.09 million grt by 1985.

Water transportation is being given a high priority in the Chinese Government's modernization program. 5/ Although there are no plans to build new shipyards, existing yards are being expanded and repair facilities are being improved. Four Japanese firms have concluded agreements to help upgrade production and modernize Chinese shipyards. 6/

The CSSC hopes to expand its capacities by improving the technology and overall quality of ship construction. China's major shipyards are utilizing many of the same new techniques as traditional shipbuilding countries. The yards have installed new production lines and remodeled old ones. They have adopted pretreatment of plants, numerical control cutting of plates, and automatic welding. The yards have also initiated advanced management methods such as specialized production and bonus systems.

1/ U.S. Department of Defense, Coordinator of Shipbuilding, Conversion, and Repair, Annual Report on the Status of the Shipbuilding and Ship Repair Industry of the United States, 1982, December 1983, p. 8-5.

2/ "Far East Shipyards," Marine Engineering/Log, September 1983, p. 50.

3/ Op. cit., Annual Report on the Status of the Shipbuilding and Ship Repair Industry of the United States 1982, p. 8-5.

4/ "China Hopes to Boost Shipbuilding 25%" American Metal Market, Oct. 2, 1984, p. 14.

5/ Op. cit., "Far East Shipyards," p. 50.

6/ Japan Economic Journal, Sept. 4, 1984, p. 11.

CSSC's ship repairing department consists of approximately 15 ship-repai yards and employs close to 25,000 workers. It has repair centers in Shanghai, Tianjin, and Guangzhou which repair and refit ships. During the first half of 1983, the yards repaired 15 ships for foreign owners. 1/

CSSC has also started producing diesel engines and marine equipment with technology acquired under manufacturing licenses from overseas. China hopes to improve after sales service and the supply of accessories so that close to 80 percent of marine machinery installed in ships will be of Chinese origin.

In 1982 when most of the world's shipyards were in a slump, China's yards were operating at full capacity and increasing their export sales. 2/ The following tabulation shows China's ship production during 1979-81 (in grt): 3/

1979----------	809,000
1980----------	818,000
1981----------	916,000

According to China's statistical bureau, more than 1 million grt of merchant ships was built in 1982. Although this is much smaller than many of the world's major shipbuilders, it was still a 9-percent increase over 1981. 4/ At the end of 1984, China had built 291 ships, totaling 690,000 tons for foreign and domestic delivery. Domestic orders have made up the largest share of ships being built in Chinese shipyards. These improvements can be attributed, in part, to more local autonomy and control in the industry. 5/ The shipbuilding boom is expected to continue into 1986. 6/

As of September 1984, China's export contracts totaled 700,000 gross tons. Most Chinese ships already delivered or being built for overseas owners were contracted on a prompt payment basis. Since late 1982, however, China has begun to utilize international methods of deferred payments to promote exports.

Government involvement

There are little or no data available on Government involvement in the Chinese shipbuilding industry. The majority of the industry's activity is controlled by a State-directed corporation. In regard to financing, in early 1983, the Bank of China began to provide export credits to foreign buyers. 7/

1/ "Far East Shipyards," Marine Engineering/Log, September 1983, p. 52.

2/ U.S. Department of Defense, Coordinator of Shipbuilding, Conversion, and Repair, Annual Report on the Status of the Shipbuilding and Ship Repair Industry of the United States 1982, December 1983, p. 8-5.

3/ "The Chinese Shipbuilding Industry: Current Situation and Prospects," China Newletter, September-October 1983, p. 18.

4/ "China Hopes to Boost Shipbuilding by 25%," American Metal Market, Oct. 2, 1984, p. 14.

5/ "Chinese Shipbuilding Posts Record Year in '84," Journal of Commerce, Jan. 15, 1984

6/ "Far East Shipyards," Marine Engineering/Log, September 1983, p. 49.

7/ Op. cit., "China Hopes to Boost Shipbuilding by 25%," p. 14.

To promote exports, China's yards also offered flexibility in design and equipment. Foreign customers can have ships built according to Chinese design, Chinese-foreign design, or foreign design. In addition, buyers can have either foreign or Chinese engines and other equipment.

Taiwan

Industry profile

Taiwan is now the third largest shipbuilder in Asia, after Japan and Korea. Taiwan has about 150 shipbuilding and repairing firms. Of these, about 145 firms build and repair small fishing boats and yachts. However, only 4 have the capacity to build or repair ships of the 1,000 gross registered tons class. The four major firms are as follows: China Shipbuilding Corporation (CSC); Taiwan Machinery Manufacturing Corporation (TMMC); Fair Wind Shipyard (FWS); and Fong Kuo Shipbuilding Co., LTD (FKS). Although approximately 98 percent of the shipbuilding and ship repairing firms are privately owned, 93 percent of construction and 64 percent of the repair work is done by the two Government-owned firms, CSC and TMMC. 1/ In 1978, these two firms were, in effect, merged as part of the Government's 6-year plan to save its shipbuilding industry, which was incurring heavy losses as a result of the decline in tanker demand. 2/

Employment in the Taiwan shipbuilding and ship repair industries rose from 27,833 workers in 1979 to 39,974 workers in 1982, or by 43.6 percent (table C-13). In 1983, employment fell to 35,882 persons. The total number of employees further declined to 30,641 workers during January-June 1984. Employment of production workers followed a similar trend and averaged 86 percent of total employment during 1979-84. Monthly wages of production workers rose from $269,000 in 1979 to $453,000 in 1983. During January-June 1984, monthly wages for production workers in the Taiwanese shipbuilding and ship repair industries totaled $568,000.

Table C-13.--Employment and average monthly wages of production and total employees in Taiwan's shipbuilding and ship-repair industries, 1979-83 and January-June 1984

Item	1979	1980	1981	1982	1983	January-June 1984
Production employees	24,135	25,857	32,885	33,833	30,233	26,178
Total employees	27,833	29,806	38,446	39,974	35,882	30,641
Average monthly wage of production employees	$269	$334	$399	$412	$453	$564
Average monthly wage of total employees	$286	$349	$414	$421	$455	$574

Source: U.S. Department of State Telegram, Dec. 7, 1984.

1/ U.S. Department of State Telegram, American Institute in Taiwan, Dec., 7, 1984.

2/ H.P. Drewry LTD, The Emergence of Third World Shipbuilding, 1978, p. 25.

The tabulation below shows the hourly compensation of employees in Taiwan shipyards during 1979-82 (the latest year for which data are available) (in dollars): 1/

1979	1.44
1980	1.85
1981	2.23
1982	2.38

Despite the Governments' shipbuilding policies and Taiwan's economic growth, CSC, the major shipbuilder has suffered from the worldwide recession. 2/ According to industry sources, the Government has no plans to expand Taiwan's shipbuilding and ship-repair capacity because of a very low capacity utilization rate. As of December 1984, CSC was utilizing only 40 percent of its shipbuilding capacity and only 60 percent of its ship-repair capacity. TMMC's shipbuilding-capacity utilization rate was only 25 percent in 1984.

The value of land, buildings, and equipment of the Government-owned shipbuilding firms in 1984 is shown in the following tabulation (in millions of dollars): 3/

Firms	Land	Buildings	Equipment	Total
CSC	40.7	134.7	114.2	289.6
TMMC	5.6	30.0	92.7	128.3
Total	46.3	164.7	206.9	417.9

Recently, CSC announced plans to invest only $71.5 million over the next six years to expand its facilities. 4/

As table C-14 indicates, while research and development expenditures by CSC were declining between 1979 and 1981, TMMC's expenditures rose and then nearly doubled from 1981 to 1982. CSC's expenditures did not increase until 1982 when they more than doubled from $340 million to $950 million in 1983. In 1984, research and development expenditures by both firms were over $1 million.

1/ U.S. Department of Labor, Bureau of Labor Statistics, April 1984.

2/ U.S. Department of Transportation, Maritime Administration, Annual Report on World Shipbuilding, 1983, p. 42.

3/ U.S. Department of State Telegram, American Institute in Taiwan, Dec. 7, 1984.

4/ "Taiwanese Shipbuilder Sets Record Year in 84," Journal of Commerce, Mar. 1, 1985.

Table C-14.-- Research and development expenditures of the 2 major shipbuilders in Taiwan's shipbuilding and ship-repair industries, 1979-84

(In thousands of dollars)

Firm	1979	1980	1981	1982	1983	1984
CSC	770	600	450	340	950	1,110
TMMC	260	190	280	440	290	1,060

Source: U.S. Department of State Telegram, Dec. 7, 1984.

Total sales for the two leading shipbuilding and repair firms in Taiwan (which constitute over 90 percent of the market) rose from $400.5 million during July 1979-June 1980 to $660.2 million during July 1983-June 1984 (table C-15). Industry estimates for July 1984-June 1985 indicate total sales of $678.6 million for the industry. Net income fluctuated greatly during the period, rising from $9.4 million in July 1979-June 1980 to an estimated $43.6 million in July 1984- June 1985. Individual company data are also shown in the table.

Table C-15.--Sales and net income (or loss) of the 2 leading shipbuilding firms in Taiwan's shipbuilding and ship-repair industries, July 1979-June 1985

(In millions of dollars)

Item	July 1979-June 1980	July 1980-June 1981	July 1981-June 1982	July 1982-June 1983	July 1983-June 1984 1/	July 1984-June 1985 1/
CSC:						
Sales	273.7	361.9	559.1	505.5	510.9	507.7
Net income (or loss)	1.3	16.5	(25.3)	48.1	53.3	34.8
TMMC:						
Sales	126.8	172.7	118.6	118.0	149.3	170.9
Net income (or loss)	8.1	7.4	(3.2)	(-.7)	9.8	8.8
Total:						
Sales	400.5	534.6	677.7	623.5	660.2	678.6
Net income (or loss)	9.4	23.9	(28.5)	47.4	63.1	43.6

1/ Figures for July 1983-June 1984 and July 1984-June 1985 are projections made by the American Institute in Taiwan.

Source: U.S. Department of State Telegram, American Institute in Taiwan, Dec. 7, 1984.

Production of commercial ships by the Taiwan industry totaled 382,051 dwt in 1979. Production then increased annually during 1980-82. Total shipbuilding production peaked at 925,353 dwt in 1982 (table C-16). This was a 19 percent increase over the previous years' production of 776,195 dwt. Between 1982 and 1983, however, production decreased by 7 percent to 861,201 dwt. During January-June 1984, production was 448,769 dwt. The state-owned

Table C-16.--Commercial ships: Taiwan production and market share of production by State-owned and private firms, 1979-83, and January-June 1984

Item	1979	1980	1981	1982	1983	January-June 1984
State-owned firms:						
Production-dwt	317,020	503,102	682,543	847,076	798,547	419,593
Market share percent	83.0	87.9	87.9	91.5	92.7	93.5
Private firms:						
Production-dwt	65,031	69,122	93,652	78,277	62,654	29,176
Market share percent	17.0	12.1	12.1	8.5	7.3	6.5
Total production dwt	382,051	572,224	776,195	925,353	861,201	448,769

Source: U.S. Department of State Telegram, American Institute in Taiwan, Dec. 7, 1984.

Table C-17.--Commercial ships: Taiwan production, by types, 1979-83, and January-June 1984

Item	1979	1980	1981	1982	1983	January-June 1984
	Quantity (deadweight tons)					
Container ships	15,000	22,000	21,611	151,180	181,343	114,844
Yachts	44,678	39,032	54,215	48,886	37,490	14,246
All other	322,373	511,192	700,369	725,287	642,368	319,679
Total	382,051	572,224	776,195	925,353	861,201	448,769
	Value (1,000 dollars)					
Container ships	16,667	24,444	24,048	152,632	145,631	82,520
Yachts	93,798	84,971	87,084	72,128	75,739	48,218
All other	247,537	344,932	562,441	447,861	292,896	128,446
Total	358,002	454,347	673,573	672,621	514,266	259,184

Source: U.S. Department of State Telegram, American Institute in Taiwan, Dec. 7, 1984.

shipbuilding firms dominated Taiwan's shipbuilding market during 1979-84, with an average market share of 89.4 percent during the period. Private firm share of the market declined from 17.0 percent to 6.5 percent of total production from 1979 to 1984. Table C-17 shows that there was a eleven-fold increase in production of container ships from 15,000 dwt in 1979 to 181,343 dwt in 1983

Table C-18.--Commercial ships: Total value in Taiwan of ship repair work and market share of repair work by State-owned and private firms, 1979-83 and January-June 1984

Item	1979	1980	1981	1982	1983	January-June 1984
State-owned firms:						
Value of ship repair work million dollars--	28.1	41.0	38.3	23.9	11.7	5.2
Market share percent--	94.6	92.3	86.6	76.4	63.9	64.2
Private firms:						
Value of ship repair work million dollars--	1.6	3.4	5.0	7.4	6.6	2.9
Market share percent--	5.4	7.7	13.4	23.6	36.1	35.1
Total value of ship repair work million dollars--	29.7	44.4	44.8	31.3	18.3	8.1

Source: U.S. Department of State Telegram, American Institute in Taiwan, Dec. 7, 1984.

The total value of ship repair work declined by 59 percent since its peak of $44.8 million in 1981 to $18.3 million in 1983 (table C-18). The market share and value of ship-repair activity for private firms was about six times as high in 1983 as it was in 1979. During January-June, 1984 repair work performed by the Taiwan industry totaled $8.1 million. As is the case in construction of new commercial ships, the State-owned firms dominate the ship-repair market.

Government involvement

Since 1949, Taiwan's Government has channeled resources to industries viewed as crucial to Taiwan's economic development. Annual, mid-term (4 to 5 year), and long-range economic policy blueprints have consistently stressed moving the small country to higher levels of income and industrial sophistication. Because of its importance to the island's economic and national security, setting up major shipbuilding and repair yards on Taiwan was one of the "Ten Major Infrastructure Development Projects" undertaken by the authorities in the 1970's. The official goal was to build all Chinese flag vessels in Taiwan. 1/

Public ownership.--As stated earlier, Taiwan's shipbuilding and ship repair industries are dominated by two State-run firms. The official contribution to CSBC's total capital was 98.3 percent in 1983, while that for Taiwan Machinery Manufacturing Corporation was 99.8 percent. 2/ Although

1/ K.T. Li, "Contributions of the Ten Major Development Projects," Industry of Free China, March 1978, p. 12.

2/ AIT Taipei 07202, Dec. 11, 1984.

exact data on the Government's capital infusions to these two firms is not available, the combined value of these firms' fixed assets--land, buildings, and equipment, as of June 30, 1984, was $417.9 million, as shown in the following tabulation (in millions of dollars): 1/

Item	China Shipbuilding Corporation	Taiwan Machinery Manufacturing Corporation
Land	40.7	5.6
Buildings	134.7	30.0
Equipment	114.2	92.7
Total	289.6	128.3

Subsidies and credit.--In addition to direct public ownership of the two largest shipbuilders, the authorities have made attractive financing available to both domestic and foreign purchasers of Taiwan-made ships. Interest rates for such loans are set at 2 percentage points below the average of long-term market rates. The repayment terms are more favorable than those on commercial loans, often allowing both longer repayment periods and a 2 to 3 year grace period before payments must begin. Such financing is available from the official Bank of Communications (BOC)--Taiwan's principal industrial policy bank--and the Export-Import Bank of China (TEXIM).

The Bank of Communications (BOC) has been providing long-term loans to underwrite infrastructure development and priority industrial sectors for over 75 years. Its outstanding loans and loan guarantees stood at approximately $2.2 billion at year-end 1983. Such loans carry low interest rates--currently, 2 percentage points below the average of prevailing long-term rates--and long repayment periods--in 1984, 10 years, with a 2-year grace period. 2/ Eighty percent of the cost of construction is covered by BOC loans. 3/ In the most recent 5-year period, the transportation services and transportation equipment industries combined received about one-fifth of the new loans extended by the Bank, as illustrated in the following tabulation: 4/

Year	Transportation Services		Transportation Equipment	
	Actual (NT$ Million)	Share of All BOC loans percent	Actual (NT$ Million)	Share of All BOC loans percent
1979	1,953	10.7	1,953	11.5
1980	2,130	8.1	3,002	11.4
1981	3,610	10.7	3,662	10.9
1982	5,002	8.0	3,874	6.2
1983	7,280	9.9	3,620	4.9

Note: In 1983, NT$38=US$1.

1/ AIT Taipei 07202, Dec. 11, 1984.

2/ For a more in-depth discussion of the Bank of Communications and its role in Taiwan's industrial development, see U.S. International Trade Commission, Foreign Industrial Targeting and Its Effects on U.S. Industries, Phase III, January 1985.

3/ AIT Taipei, 07202, Dec. 11, 1984.

4/ Bank of Communications, Annual Reports, 1979-83.

In 1983, the transportation equipment industry received approximately $95 million in new loans from the BOC, while the transportation services industry received approximately $192 million. The transportation equipment category includes automobiles, rail cars, motorcycles and ships, but the shipping sector reportedly receives the bulk of such loans. The transportation services industry includes shipping and railroads.

Recently, the BOC offered low-interest loans to the Evergreen Line, a private Taiwan shipping firm, to finance construction of six containerships by the China Shipbuilding Corporation. Subsidies inherent in the loans are estimated to be $21.9 million for each of the six vessels ordered. 1/

The Export-Import Bank of China (TEXIM) has offered preferential financing for ship exports since 1977. TEXIM provides loans, guarantees, and export insurance for such sales. TEXIM's interest rates are comparable to those prevailing under the OECD Export Credit Arrangement and are currently 1.5 percent above the interbank rate in Taiwan. At year-end 1983, it had outstanding loans of $187 million. The principal recipients of its loans have been the machinery and shipbuilding industries. Export credits are its main financing vehicle. However, shipbuilders and operators may also benefit from TEXIM's medium term loans for exporters, which can be used to finance imports of materials from abroad. Loans to the shipbuilding industry accounted for nearly half of all loans extended in 1981. 2/ The value of loans extended by TEXIM increased substantially from 1979 to 1981. By 1981, TEXIM's export credits for ship sales totaled about $71 million.

Tax benefits.--Taiwan's tax code has been employed to encourage a number of industrial activities, including investment in new plant and equipment, research and development, and foreign sales. Firms that engage in these activities qualify for tax holidays, accelerated depreciation on specified plant and equipment, and tax reserves. Approximately $659 million in tax reductions were claimed under these incentive schemes in 1982. Although a number of activities are promoted by Taiwan's tax policies, the most widely claimed and substantial tax incentives are those for exporters. 3/

Shipbuilding and repair firms have the option of a 5-year income tax holiday for new investment or a 4-year tax holiday for expansion projects. After the tax holiday, their business income is subject to a ceiling tax rate of only 25 percent, compared with the normal rate of 30 percent. The ceiling rate is lowered to 22 percent if the shipyard has the capacity to build 100,000 dead weight ton class vessels. The only firms having such capabilities are the State-owned TMMC and CSBC. Firms engaged in shipbuilding, repairs, and scrapping also benefit from Government incentives for investment in advanced machine tools, sophisticated electronic equipment, and computerized process controls. Purchasers of both domestically produced and imported equipment qualify for such benefits.

1/ Journal of Commerce, Sept. 14, 1982, Section 2, page 1.

2/ U.S. International Trade Commission, Foreign Industrial Targeting and its Effects on U.S. Industries, Phase III, January 1985.

3/ For a more detailed treatment on Taiwan's tax incentives, see U.S. International Trade Commission, Foreign Industrial Targeting and its Effects on U.S. Industries, Phase III, January 1985.

Research and development assistance.--Officially sponsored research and foreign-generated technologies have been the driving force behind Taiwan's technological advancement. In its current national R&D plan, a goal of raising national expenditures for R&D by 15 percent annually during 1980-89 was set, with total R&D targeted spending rising from 0.6 percent of GNP in 1979 to 2.0 percent in 1989. Half of those funds are to be supplied directly by the authorities, while public enterprises will indirectly supply another 20 percent. Official research efforts will center on energy, materials, information, and automation technologies. Some $375 million will be spent in 1984 to subsidize new product research and development. Another $526 million will be used to provide low-interest loans to private firms engaging in specific research. Further development of Taiwan's shipbuilding capabilities was also specifically mentioned in the plan. 1/

Export promotion.--The authorities rely heavily on subsidized export credits from TEXIM to support foreign ship sales. Export promotion funds are also allocated in the budget each year. In fiscal 1984, $98.6 million was earmarked for export promotion activities. 2/

Impact of Government policies.--Officials continue to seek expanded use of Taiwan-built vessels for carrying the vast amounts of cargo that arrive at and leave the island's ports. Because many of the existing facilities sat idle in 1984, the Taiwan authorities have slowed plans for expanding shipbuilding or ship-repair facilities. However, the general thrust of those plans appears to be in the direction of greater shipbuilding and ship-repair output, even if it must be supported by heavily subsidized loans and direct cash infusions from the Treasury. Nevertheless, it appears that Taiwan's shipping firms will continue to be able to purchase foreign- and domestically built ships without restriction.

Singapore

Industry profile

Singapore is an important ship-repair and oil-rig-building center. Its yards construct only a small number of conventional ships. 3/ However, Singapore's yards, like most others around the world, have felt the effects of the oil glut and reductions in the world's tanker fleet. As such, many of the shipyards are diversifying out of ship repair and into ship conversion and offshore related work. One such firm that has three yards, is the Keppel Group, which is wholly owned by the Government of Singapore. Although it has expanded its repair facilities to include a 330,000 dwt dry dock, repair work only accounts for 50 percent of its revenues. Shipyard Ltd is Singapore's leading shipbuilder. The company started out as a ship-repair yard and, in 1971, diversified into ship construction. By mid-1976, because of the depressed shipbuilding and ship-repair market, Jurong took over the assets and

1/ U.S. International Trade Commission, Foreign Industrial Targeting and Its Effects on U.S. Industries, Phase III, January 1985.

2/ Ibid.

3/ "Far East Shipyards," Marine Engineering/Log, September 1983, p. 44.

operations of its sister shipbuilding company. 1/ Since this rationalization move, Jurong has focused on repair work and offshore construction and fabrication. Sembawang Shipyard's is the largest ship repair yard in Singapore. 2/ The major oil rig builders in Singapore are Far East Livingston, Bethlehem Singapore, Marathon Le Tourneau, and Robin Shipyards. 3/

In 1983, Singapore's shipyards employed 30,000 workers, only half of which were from Singapore. 4/ During the boom years, Singapore's yards employed foreign workers in addition to local labor. As a result of the recession, however, severe cutbacks in employment have occurred. 5/ By 1991, all unskilled foreign workers are to be phased out. 6/

Singapore's industrial wages are among the highest in Southeast Asia. In 1983, hourly compensation costs in Singapore's manufacturing industries were $2.17. High industrial wages plus a strong currency, however, have cut into the competitiveness of Singapore's shipbuilding and ship repairing industries. 7/ In 1982 (the latest year for which data are available), compensation costs of $2.45 per hour for Singapore's shipbuilding and ship-repairing employees, were higher than those in Taiwan and Korea. The tabulation below shows hourly compensation costs during 1979-82:

Year	Hourly compensation cost
1979	$1.66
1980	1.95
1981	2.34
1982	2.45

Singapore once had the world's second largest rig-building industry. In 1983, however, it suffered a 40 percent drop in revenues. At the end of May 1984, only one rig was on order in Singapore's five rig building yards. 8/ The number of rigs built by Singapore yards dropped from 20 in 1982 to 10 in 1983 because of the decline in oil exploration activities. Rig builders were forced to diversify into other structural steel fabrication, such as cranes and barge building. 9/

Singapore's shipyards felt the effects of the depressed shipbuilding market and threats of protectionism from abroad in 1983. The number of

---

1/ H.P. Drewry, Ltd., The Emergence of Third World Shipbuilding, 1985, pp. 31-32.

2/ "Far East Shipyards," Marine Engineering/Log, September 1983, p. 44.

3/ H.P. Drewry, Ltd., The Emergence of Third World Shipbuilding, 1978, p. 53.

4/ "Decline in Tanker Repairs Takes Big Bite Out of Shipyards Profits," Journal of Commerce, Oct. 31, 1984, p. 11A.

5/ Far East Yards Set For Big Changes, Marine Engineering/Log, July 1984, p. 58B.

6/ Journal of Commerce, Oct. 31, 1984, p. 11A.

7/ Marine Engineering/Log, July 1984, p. 58B.

8/ "Far East Shipyards," Marine Engineering Log, July 1984, p. 61.

9/ "Decline in Tanker Repairs Takes Big Bite Out of Shipyard Profits," Journal of Commerce, Oct. 31, 1984, p. 11A.

vessels launched fell from 331 in 1982 to 229 in 1983, with total tonnage falling from 215,000 grt to 137,000 grt. The total value of ship production fell from S$620 million to S$532 million during this period. In 1983, shipbuilders built sophisticated medium- and small-sized vessels that included several anchor-handling vessels, containers, deck cargo barges, an inter-rig survey vessel and a grain barge.

Profitability in Singapore's marine industry dropped by 34 percent from S$2.3 billion in 1982 to S$1.5 billion to 1983. Most of the decline was due to decrease in tanker repairs. Oil fields have been discovered nearer to the major oil countries, which means that global tanker traffic has changed, resulting in less repair work for Singapore. 1/

Government involvement

Government ownership.--The Singapore Government owns 78 percent of Sembawang Shipyard and about 71 percent of Keppel Shipyard. Joint ventures with Japanese companies have further provided the Government with significant shares of other major yards: 49 percent of Jurong Shipyard is owned by the Singapore Government, and 51 percent is owned by Ishi Kawajima Harima Heavy Industries; Mitsubishi-Singapore Heavy Industries is a 51/49 percent joint venture between the Japanese Mitsubishi Group and development institutions controlled by the Singapore Government. The Government also has equity in a number of small shipyards and owns about 70 percent of the Neptune Orient shipping line.

Research and development.--As part of a general product development scheme, the Singapore Government initiated various incentives to aid in the development of new products and processes for all industries, including shipbuilding. Tax deductions and incentives for R&D expenditures include double deduction of R&D expenditures (other than building and equipment); accelerated depreciation over 3 years for all plant and machinery relating to R&D; and an investment allowance of up to 50 percent of the capital investment in R&D, including building costs. 2/

Tax policies.--In addition to the tax benefits available to shipyards for R&D expenditures, the Singapore Government offers a variety of other tax incentives to attract both foreign and local investment. Accelerated depreciation is available for machinery and equipment. Buildings do not qualify. 3/

An enterprise in an approved "pioneer industry" may be granted a 5 to 10-year exemption from income tax. The exemption is granted on the amount of profits after deduction of capital allowances. Since 1970, the pioneer status criteria has been used to encourage export-oriented industries and encourage a higher degree of technology.

1/ "Decline in Tanker Repairs Takes Big Bite Out of Shipyard Profits," Journal of Commerce, Oct. 31, 1984, p. 11A.

2/ U.S. Dept. of Commerce, International Trade Administration, Overseas Business Reports: Marketing In Singapore, June 1981, p. 24.

3/ Price Waterhouse, Doing Business in Singapore, May 1981, p. 55.

Shipping lines receive tax benefits through a tax allowance program. Income earned from transport of goods and passengers on ships registered in Singapore but operating outside of Singapore is exempt from income tax. 1/ Income earned from the charter of such ships is also exempt. The exempt income can be distributed as tax-free dividends to the shareholders of the shipping enterprise. 2/ Materials imported for new building, conversion, maintenance, and repair are free of customs duties.

Subsidies/financing policies.--The Ship Financing Scheme is administered by the Development Bank of Singapore for construction of vessels above 100 grt, oil rigs, and dredges. Loans are also available for major conversion work on cargo and passenger vessels. All projects are subject to Government approval.

Under the financing scheme, domestic purchasers can receive up to a maximum of 85 percent of the contract value or S$20 million, whichever is lower. Foreign purchasers can receive up to 80 percent of the contract value or S$20 million, whichever is lower. Financing is available in Singapore or U.S. dollars with the option exercised by the purchaser. Interest rates are identical for foreign and domestic buyers and fixed at a maximum of 10 percent for Singapore dollar borrowing and 12 percent for U.S. dollar borrowing. Domestic purchasers have 10 years after delivery to repay the loan, inclusive of a 2-year grace period. Oil rig buyers and foreign purchasers have up to 8 1/2 years to repay the loan.

Under some circumstances, financing can be up to 90 percent of the contract value for vessels over 500 grt built by domestic yards for domestic purchasers. These loans are repayable over a maximum of 12 years after delivery, inclusive of a 3-year grace period.

The shipbuilding and repair industries in Singapore are also assisted by a variety of general Government incentives to encourage domestic and foreign investment in its industries. A capital assistance scheme, operated by the Economic Development Board, promotes high technology and capital intensive projects. The assistance under this scheme is available to local and foreign companies through equity participation or long-term loans. 3/ The Small Industries Finance Scheme can assist maritime equipment manufacture through provision of loans that aid small industries in manufacturing and assembly operations.

The Singapore Government also subsidizes a number of industrial training institutions and operates an industrial training grant scheme to encourage companies to organize in-plant programs. Cash grants are also available to purchase machinery and equipment for training. Additionally, the Skills Development Fund provides grants for training programs aimed at developing and upgrading skills. 4/

1/ M.A.N. - B&W Diesel, Marketing Sales Research, Financing and Subsidizing the Marine Industries, 4th ed., Nov. 1982, Copenhagen, Denmark, p. 6.66.

2/ Ibid., p. 6.67.

3/ Price Waterhouse, Doing Business in Singapore, May 1981, p. 13.

4/ Ibid., p. 14.

Other policies.--Singapore ended 12 years of open registry in September 1981. Only vessels owned by Singapore citizens, permanent residents of Singapore, and companies incorporated in Singapore were allowed to register after that date. Companies must also have a paid-up capital of at least 10 percent of the value of the first ship registered on or after April 20, 1979, subject to a minimum of S$50,000. There is no restriction on the size of locally owned vessels that may be registered, but age limits have been set so that as of January 1, 1984, only ships of less than 15 years may be registered.

Impact of Government policies.--Since the Government began to develop the domestic ship repair industry in the 1960's it has become an important source of foreign exchange earnings and, together with shipbuilding, it is the leading heavy industry. Singapore has actively encouraged the development of its industry through Government ownership, tax concessions, and customs duty exemptions.

Australia

Industry profile

As of October 1984, there were 38 Australian shipyards building commercial vessels. Between July 1, 1980 and October 1984, Australian ship builders completed 186 vessels (table C-19). Most of Australian vessel construction was concentrated on dredges, barges, tugs, and rig service vessels rather than larger ships.

Table C-19.--Commercial ships: Australian production, by types, fiscal years 1980/81 to 1984/85 1/

Item	1980	1981	1982	1983	1984
Tankers, ro/ro cargo vessels, and oil rigs	0	0	1	2/	1
Dredges, barges, tugs, and rig service vessels	3	10	15	2/	3
Fishing vessels	6	13	6	2/	8
Ferries and launches	4	10	13	2/	5
Total	13	33	35	88	17

1/ Fiscal year covers period from July 1 through June 30.
2/ Not available.

Source: Official Statistics of the Government of Australia, provided by Embassy of Australia, Washington, DC, January 1985.

At present, there are approximately 2,000 workers employed in the Australian shipbuilding and repair industry. Under a proposed industrial agreement between the Australian Council of Trade Union (ACTU) and the

shipbuilding industry, wages and working conditions throughout the industry will be consolidated, training courses to upgrade employees skills will be developed, and an examination of work practices to eliminate waste will be conducted. Under this agreement, a joint employer-union committee to cover the introduction of new technology and equipment will be established. 1/

Government involvement

In October, 1984, the Australian Government announced an assistance package for the shipbuilding industry. The current bounty system, under which shipbuilders are paid 25 percent of their construction costs for vessels for the domestic market, will be extended to include overseas contracts. The new scheme will cover ships on which construction was begun on or after December 10, 1984. Bounty assistance payments would be subject to the following provisions: There would be an annual limit on bounty payable on ships built for export of approximately $7.23 million for fiscal year 1985 and $12.05 million for 1986; the shipbuilder must be registered under the new criteria 2/; and the present conditions with respect to minimum size and other matters will continue to apply. 3/ Presently, there are 88 shipbuilders registered under the Bounty (Ship) Act of 1980; however, it is expected that this number will be reduced when the new system goes into effect. 4/

Also, under the new financial assistance program, the 2 percent duty on imported goods used in the construction of bountiable ships would be lifted. The Australian Industry Development Corporation (AIDC) and the Department of Industrial Commerce (DIC) are expected to deny other financial arrangements to aid shipbuilders in securing overseas contracts. A shipbuilding Consultative Group (SCG) will be established to monitor the bounty system. The new legislation is expected to be introduced in Parliament as soon as possible. 5/

The Government of Australia also presently assists the shipbuilding and ship-repair industry in the acquisition of components. Machinery and equipment to be utilized in the construction of new commercial vessels may be imported at lower than normal duty rates. This provision normally applies, however, only when equivalent components are not available from domestic equipment manufacturers. 6/

1/ "GOA Financial Assistance to the Australian Shipbuilding Industry," U.S. Department of Commerce Telegram, U.S. Embassy, Canberia, October 1984.

2/ The bounty will only be paid to shipbuilders who have "a clear and long-term commitment to the industry." Other criteria are that the company is an Australian-registered business, has the financial and commercial capacity to build the bountiable vessel and employs an average of 20 people in shipbuilding.

3/ Fishing vessels must have a designed load water line length of more than 21 meters and other vessels must have a gross construction tonnage of more than 150 tons to be eligible for the bounty.

4/ Official statistics of the Government of Australia, provided by Embassy of Australia, Washington, DC, January 1985.

5/ Ibid.

6/ U.S. Department of Transportation, Maritime Administration, Maritime Subsidies, February 1983, pp. 10-13.

Denmark

Industry profile

Since the oil crisis of the early 1970's, Denmark's shipyards have demonstrated their capability to adapt to changing market conditions by building a wide variety of ships and equipment for infrastructure projects. Most Danish shipyards have very flexible operations that allow them to build a range of different products, including ships and equipment for infrastructure projects, as well as powerplant and offshore equipment. 1/ One reason Denmark has been more successful in surviving the worldwide shipbuilding slump than many other European nations is that many of its yards are owned by shipping companies and most orders are placed by domestic owners. 2/ All Danish shipyards are privately owned. Industry sources cite this fact as the rationale for the yards becoming more competitive and for eliminating unproductive yards. 3/ Denmark has 10 shipyards that have the shipbuilding and repair capacity for commercial ships over 1,000 grt. Eight of these are members of the Association of Danish Shipbuilders and account for approximately 90 percent of production. The two largest shipyards are Odense Staalskibsvaerft A/S and Burmeister and Wain (B&W), which concentrate mostly on newbuilding. 4/

According to table C-20, Odense Staalskibsvaerft accounted for close to 60 percent of production in 1979, 1980 and 1983. B&W, however, accounted for at least 50 percent of deliveries in 1981 and 1982.

Table C-20.--Share distribution of production in Denmark's shipbuilding and ship-repair industries, by firms, 1979-83

(In percentage)

Firms	1979	1980	1981	1982	1983
Odense Staalskibsvaerft A/S percent--	57	61	27	36	58
B&W A/S----------do----	9	27	59	50	34
Frederickshavenvaerft A/S do----					
A/S Nakskov Skibsvaerft--do----	24	2	9	6	2
Aalborg/Vaerft A/S-------do----	4	5	1	4	1
All other----------do----	4	1	2	1	1
Total production (1,000 dwt)----------	403.6	274.7	433.8	639.9	758.8

Source: U.S. Department of State Telegram, American Embassy, Copenhagen, December 1984.

1/ U.S. Department of State Telegram, American Embassy, Copenhagen, December 1984.

2/ "Scandinavian Shipbuilding," Maritime Reporter and Engineering News, July 15, 1984, pp. 24-32.

3/ "Builders Supported by National Owners and Attractive Finance Schemes," Fairplay, Sept. 6, 1984, p. 27.

4/ U.S. Department of State Telegram, American Embassy, Copenhagen

The following tabulation, compiled from data obtained from a U.S. Department of State Airgram, ranks the five major repair yards according to their estimated share of repair work in 1983:

	(In percent)
Aalborg Vaerft A/S	38
Frederikshaven Vaerft A/S	15
Fredericia Skibsvaerft A/S	15
Dannebrog Vaerft A/S	10
A/S Nakskov Skibsvaerft	8
All other firms	14
Total	100

Each of Denmark's medium and large shipyards employ between 300 and 3,000 workers. As table C-21 indicates, from 1979 through 1982, employment at Danish shipyards remained relatively steady between 14,000 and 15,500 workers. However, due to the closure of the large Helsingor shipyard in mid-1983 and the temporary reduction in employees at the Nakskov yard, employment dropped to about 13,600 by the end of 1983. By the end of 1985, employment is expected to drop sharply to 11,200 persons. Denmark's shipyards are increasingly basing their production on subcontracting, both domestic and foreign. It is estimated that about 10 percent of total shipyard employees annually are involved with ship repair and rebuilding work.

Table C-21.--Employment in Denmark's shipbuilding and ship repair industries, 1979-83

Item	1979	1980	1981	1982	1983
Production workers	11,325	11,490	12,380	12,660	11,080
White collar workers	2,525	2,560	2,850	2,880	2,520
Total	13,850	14,050	15,230	15,540	13,600

Source: U.S. Department of State Telegram, U.S. Embassy, Copenhagen, December 1984.

Danish shipbuilders are among the highest paid workers in the country. However, as seen in the following tabulation compiled from data from a U.S. Department of State Telegram, average blue collar hourly wages have declined by 17 percent between 1979 and 1983, from $11.10 per hour to $9.23 per hour.

Year	Hourly wages
1979	$11.10
1980	11.52
1981	9.98
1982	9.46
1983	9.23

Since the mid-1970's, the major Danish shipyards have undergone significant expansion and modernization of both repair and shipbuilding facilities. Capital expenditures for land, equipment, and buildings have amounted to between $10 and $20 million per year.

There are no statistics available for research and development expenditures by Danish shipyards. However, significant amounts have been spent to introduce new production- and design-related technology, including CAD/CAM systems, and to improve standardization processes. The Danish shipyards standards committee has decided to expand standardization to focus on material, equipment, measurements, tests, and similar areas.

Danish shipyards insist that they must continue to invest heavily in new technology and to concentrate on building highly efficient, modern ships in order to remain competitive. In recent years, the industry has diversified into the manufacture of offshore equipment, superstructures, cranes, and boilers. Danish shipyards are also optimistic about opportunities in connection with the North Sea hydrocarbon exploration activities. 1/

During 1979-1982, total sales of the 10 major shipyards doubled from DKR 3.6 billion to DKR 7.5 billion. Danish shipyards are active, however, in other industrial production including marine equipment, boilers, offshore platform units and bridge construction, which account for 20 percent of their total net sales. The following tabulation shows net sales by shipyards excluding the sales of other industrial products (in millions of dollars): 2/

Year	
1979	$625.0
1980	680.8
1981	662.0
1982	682.0
1983	700.2

Total deliveries increased from 251,200 grt in 1979 to 448,000 grt in 1983 (the latest year for which data are available) (table C-22). 3/ Deliveries of product carriers, bulk/carriers, and Ro-Ros increased between 1979 and 1983, while tanker production was low or nonexistent, reflecting world overcapacity in this area. 4/

In the first quarter of 1984, 11 vessels were ordered from Denmark for a total of 34,000 grt, ensuring that a relatively high level of production would continue at least in the short term. 5/

1/ U.S. Department of State Telegram, American Embassy, Copenhagen, December 1984.

2/ Ibid.

3/ "Ship Financing in Denmark Gives Owners Attractive Alternatives," Fairplay, Sept. 6, 1984, p. 31.

4/ U.S. Department of State Telegram, American Embassy, Copenhagen, December 1984.

5/ "Scandinavian Shipbuilding," Maritime Report and Engineering News, July 15, 1984, pp. 24-32.

Table C-22.--Commercial ships: Danish production, by types, 1979-83

(In thousands of gross registered tons)

Item	1979	1980	1981	1982	1983
Product carriers	78.6	.0	20.9	35.4	103.7
Bulk carriers	1/	33.5	133.7	253.5	215.5
General cargo	139.4	50.2	1.6	16.5	3.2
Container ships	1/	60.0	60.0	67.0	37.1
Ro-Ro ships	4.8	1.6	3.2	7.7	23.7
Reefers	10.4	15.2	.0	.0	.0
Cement carriers	4.7	.0	.0	.0	.0
LPG tankers	.0	.0	43.6	15.6	.0
Chemical tankers	.0	.0	.0	.0	23.4
Ferries/passenger ships	8.2	21.2	49.8	9.0	9.1
Supply ships	1.6	4.8	3.2	3.2	3.2
Tug boats	.0	.2	.7	.2	.5
Icebreakers	.0	1.5	.0	.0	.0
Marine research ships	.0	.0	2.5	.0	.0
Cable ships	.0	.0	.0	2.3	.0
Trawlers	1.5	2.9	.5	.0	.0
Training ships	.0	.0	.0	.0	19.1
Other (navy ships)	2.0	6.4	1.4	0.8	9.6
Total	251.2	197.5	321.1	411.2	448.1

1/ Not available.

Source: U.S. Department of State Telegram, American Embassy in Copenhagen, December 1984.

Government involvement

The privately owned Danish industry receives no production subsidies from the Government. The Government extends preferential loans to domestic and foreign owners under OECD guidelines to purchase ships; however, this support is limited to an interest rate subsidy. The Home Market Arrangement allows the Danish Ship Credit Fund (DSCF) to make loans covering 80 percent of the contract value at an interest rate of 8 percent for 12 years, with a 2-year grace period if the ship is ordered before yearend 1984 for delivery before yearend 1987. 1/ The Arrangement was established in 1977 to meet increased competition from foreign government subsidized shipyards and applies only to purchases of ships by Danish owners in Denmark or in the other European Community (EC) countries.

The Fund issues the loan in the form of bonds of a nominal value equal to the face value of the loan. The bonds carry a rate corresponding to the interest rate charged on the loan. The bonds are quoted at the Copenhagen

1/ OECD Maritime Committee, op. cit. However, a decreased rate of 33 percent is applied if the taxable income does not exceed BF 1,000,000 and 40 percent if the taxable income does not exceed BF 3,000,000.

Stock Exchange, but the central bank purchases the bond at par value from the owners through private banks. 1/ When the purchase is made outside Denmark, a supplementary buyer's credit is granted to enable the owner to obtain loans on the above-mentioned credit terms. Under OECD guidelines, the State makes loans covering 80 percent of the contract value and a credit period of 8.5 years with an interest rate of 8 percent for exports of new ships. Credit programs include three other arrangements, as follows:

- o "Prior loan arrangement" provides loans during the production period of up to 75 percent of the loan committed by the DSCF with rates between 1-2 percent.

- o "Matching arrangement" allows yards to match a foreign competitive offer if it was documented that the Danish yard could lose an export order since the foreign offer granted better terms.

- o "Rebuilding arrangement" provides for loans at OECD terms for rebuilding certain ships for an export order at individually determined rates.

The costs to the Government of the above-mentioned financing programs are equal to the costs of the interest-rate spread between the rate applied in the financing programs and the prevailing market interest rates. DSCF loans granted have amounted to $93 million in 1979; $117 million in 1980; $198 million in 1981; $205 million in 1982; and $165 million in 1983.

Special loans for building fishing boats are granted by the Danish Fishing Bank at prevailing interest rates and carry no obligation to build the vessel in Danish or EC shipyards. Export credit insurance is available from the Export Credit Institute, with annual premiums ranging between 0.3 and 0.5 percent on the outstanding debt. 2/ Operators of small ships along the coast are provided mortgage guarantees for construction or conversion of small cargo ships. In 1983, $13.11 million was allocated for this purpose. 3/

Danish builders benefit by large infusions of private capital as a result of generous tax deferment rules applicable to investors who gain immediate depreciation benefits at values far above the capital investment. Production subsidies are subject to income tax, but depreciation may be made on the full purchase price. 4/ Profits, established on sales or losses of vessels, may reduce the basis of depreciation on other vessels. Anticipated depreciation on vessels is permitted on and after that year in which the contract is made but may not exceed 30 percent of the adopted purchase price. The yearly maximum depreciation is 15 percent, and the building cost may be at least DKR 200,000. After delivery, the anticipated depreciations that have been made are deducted from the purchase price. At the time of assessment of the taxable income, owners may make fiscal depreciations on vessels that are used for trade. All

---

1/ Policy Guidelines, op. cit.
2/ OECD Maritime Committee, op. cit.
3/ Commission Report to the Council on Aid to Shipbuilding for the Last Half of 1982, op. cit., Nov. 21, 1983.
4/ U.S. Department of Transportation Maritime Administration, World Government Aid to Shipbuilders and Shipowners, March 1984, p. 5.

vessels belonging to the business of a taxable person are written off on a joint balance with up to 30 percent written off annually. On new purchases within a year, only 25 percent of the purchase price may be written-off. Profits and losses form part of the general taxable income. Exempted from this are profits and losses on the closure of a firm that takes place more than 5 years after the purchase of a vessel.

France

Industry profile

France, like all other European countries has been restructuring its shipbuilding industry. Massive mergers that will consolidate France's five major yards into two are currently being undertaken. The three biggest yards at Dunkirk, La Ciotat and La Seyne have been merged into Chantiers du Nord et du Mediterranee. Alsthom-Atlantique de l'Atlantique's operation at St. Nazaire is to be combined with Dubigeon-Normandie. The 5 major shipyards and 10 medium and small yards are shown in figure C-2.

There are several powerful maritime associations in France. The major one is the Association of French Marine Industries. Other organizations include GENEMA, the French shipbuilders' export association, and SIRENA, the French ship-repairer's association. These associations are expected to become more powerful because the demotion of the Ministry of Sea within the French Socialist Government. The shipbuilding associations are concerned about Government intrusion in the form of regulations and taxation. They also do not approve of the Government's plans for expansion when the industry is struggling just to remain competitive. 1/

One area where French shipbuilders have met with success is in cruise-ship construction. In 1983, two cruise vessels were to be delivered from Chantiers de l'Antique, and one was under construction at La Seyne.

The French are earning a reputation for supplying a wide variety of marine equipment to overseas markets. Alsthom Atlantique and SACM in Mulhouse build some of the world's most powerful diesel engines. SACM diesels have been ordered for vessels ranging from inland waterways craft to high speed patrol boats. SACM has also built the world's largest platform and semisubmersible for offshore work. Sales' volume for marine equipment has been rising steadily for 5 years. 2/

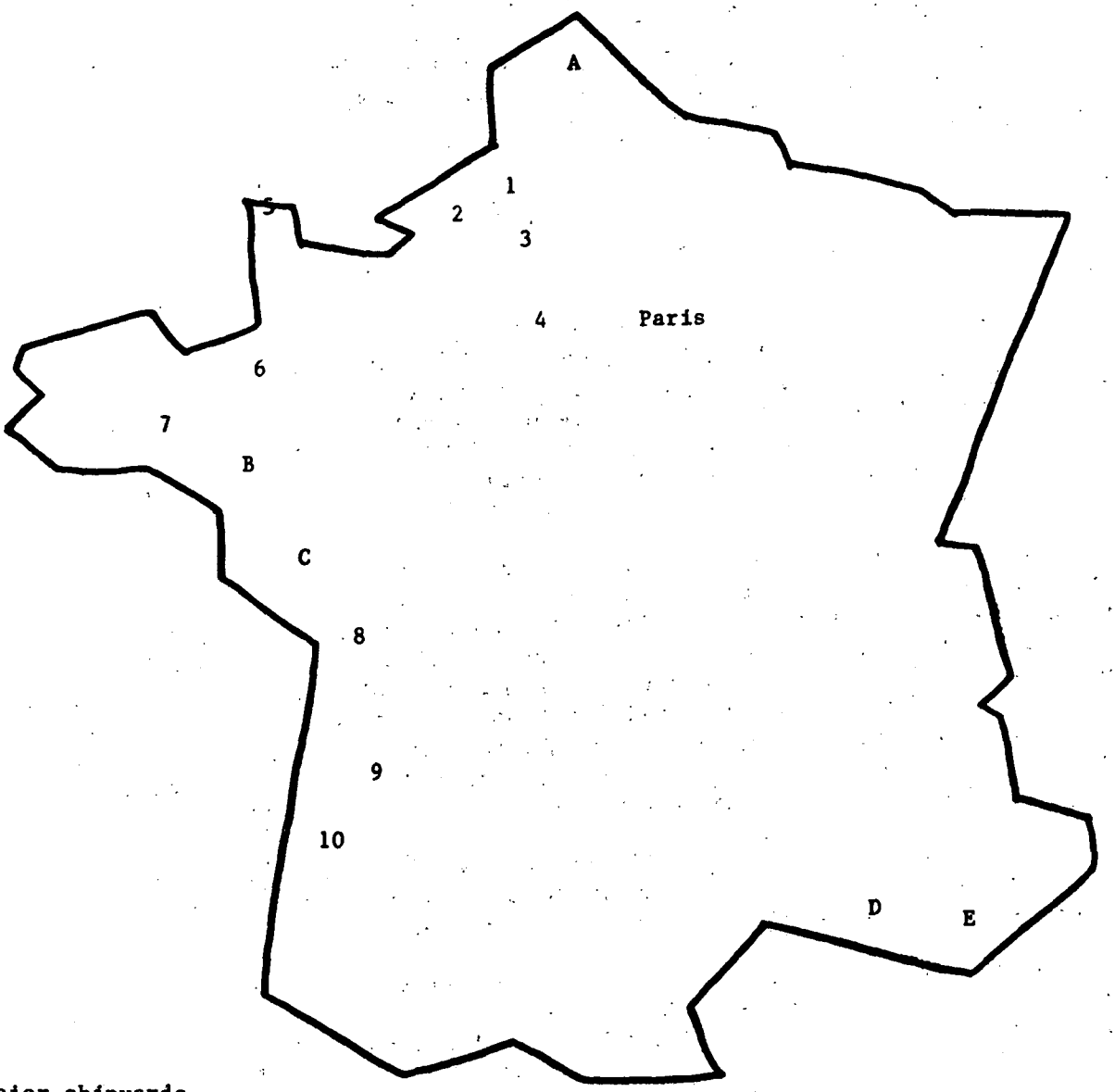
At the end of 1983, employment in the French shipbuilding industry totaled 24,000. At that time, the Government planned further restructuring in the industry, therefore, job losses were expected. Instead, the Government proposed shorter working time, a freeze on new recruitment, and early retirement. The Government also planned reductions in subcontractors and more training to improve flexibility within the work force. 3/

1/ "French Maritime Industries," Marine Engineering/Log, June 1983, p. 68.

2/ Ibid., pp. 65-68.

3/ U.S. Department of Transportation, Maritime Administration, Annual Report on World Shipbuilding, 1983, p. 22.

Figure C-2.--Major French shipbuilders and ship repairers.



Major shipyards
A - Chantiers du Nord et Mediterranee
B - Chantiers de l'Atlantique
C - Dubigeon-Normandie
D - Chantiers du Nord et Mediterranee
E - Chantiers du Nord et Mediterranee (Naval dockyard)

Medium and smaller-sized shipyards
1 - Ateliers et Chantiers de la Manche
2 - Ateliers et Chantiers du Harve
3 - Ateliers Francais de l'Ouest (Grand-Quveilly)
4 - Societe Francais de Constructions Navales (Villeneuve-la-Garenne)
5 - Constructions Mecaniques de Normandie (Naval dockyard)
6 - Ateliers et Chantiers de la Marche
7 - Chantiers et Ateliers de la Perriere (Naval dockyard)
8 - Ateliers et Chantiers de la Rochelle-Pallice
9 - Ateliers et Chantiers du Sud-Ouest
10 - Chantiers et Ateliers Auroux

Source: "French Maritime Industries," Marine Engineering/Log, June 1983, p. 66.

In recent years, France has declined in importance in the world shipbuilding market. During the second half of 1983, France did not receive a single merchant shipbuilding order. Table C-23 shows that 37 vessels were completed by France's shipyards in 1983, with product carriers and LPG and chemical carriers accounting for 38 percent of the 313,245 grt total.

The value of ship-repair work has declined for the past 10 years in France, just as it has in the other European countries. However, with the opening of several new drydocking facilities in recent years, which have expanded the industry's capabilities, the outlook for ship repair is better than that for new building. Among the yards with a strong repair business is Ateliers et Chantiers de Marseille Provence (ACMP). In 1981, about 71.6 percent of the repair activity at this yard was for foreign ship owners. Major repair docks are also located at Brest, Dunkirk, La Havre and Saint-Nagaire--all of which belong to a subsidiary of Dubigeon-Normandie. 1/

Table C-23.--Commercial ships: French production, by types, 1983

Type	Quantity	Weight 1/
		gross registered tons
Crude oil tankers	0	-
Product carriers	3	60,900
Bulk carriers	0	-
Combined carriers	0	-
General cargo ships	1	9,858
Reefers	0	-
Full Container ships and high speed liners	1	30,667
Ro-Ro vessels and car carriers	0	-
LPG and chemical carriers	5	108,000
LNG carriers	0	-
Small cargo ships	0	-
Miscellaneous vessels	27	103,820
Total	37	313,245

1/ Estimated by the staff of the U.S. International Trade Commission.

Source: Association of West European Shipbuilders, 1983, except as noted.

Government involvement

Government financing is available under OECD credit terms for domestic ship-construction projects. Interest rate subsidies are available to guarantee that no more than 8-percent interest is incurred by owners. 2/ Domestic owners may obtain up to a 15-percent grant on the contract price of new construction

1/ "France: Dry Docks in Deep Water," Shiprepair, August 1982, p. 49.
2/ World Government Aid, op. cit., p. 9.

under two plans: (1) a 7.5-percent subsidy if the owner increases his assets by the same sum within 1 year of delivery; and (2) a subsidy of up to 7.5 percent based on the project's social and economic importance. For ships brought into the fleet by yearend 1983, the interest rate subsidy was granted on 60 percent of the vessel's purchase price only if the work was performed by French yards. Repayment is at 8 percent over 7 years. 1/

The Government has a price guarantee program by which it pays 80 percent of the cost of an increase (in excess of 6.5 percent) between the order and delivery on fixed price sales to third country owners. The Government pays a premium of 0.5 percent annually when the threshold is not exceeded. 2/ There is an insurance scheme against certain cost overuns due to inflation in excess of 6.5 percent. 3/

A Government production subsidy covers 20 percent of the contract price for vessels built in large shipyards and 10 percent of the contract price for vessels built in small shipyards. The total individual amount of aid may not exceed FF 30 million. The maximum tonnage to be built with production aids is limited to 25,000 grt. Government appropriations for shipyard subsidies have amounted to $222 million in 1978; $306 million in 1979; $355 million in 1980; $351 million in 1981; $201 million in 1982; $370 million in 1983; and a proposed $662 million in 1984. 4/ 5/

French yards receive Government grants covering up to 25 percent of the cost of restructuring. Restructuring has entailed the closure of a number of small yards and concentration on high-technology ships by the large yards. 6/ The Government's policy has recently resulted in the merger of the major yards into two separate groups, with a significant State holding in one of them. There is a multiannual aid program designed to support the development of the industry. The Government has provided aid to mergers of leading yards and is expected to steer State-owned shipping lines to order vessels in domestic yards. 7/ Customs duties are waived on material imported for the building of ships and value-added taxes are waived on ships built for export.

1/ Ibid., p. 10.

2/ Report of the Commission to the Council on Aid to Shipbuilding During the Last Half of 1982, November 21, 1983.

3/ World Government Aid, op. cit., p. 10. The scheme is administered by the Ministry of Transport through Compangie Francaise d'Assurance du Commerce Exterieur and is applicable to all goods under export contracts.

4/ World Government Aid, op. cit., p. 10.

5/ In 1981, the Government granted production aid covering between 3-20 percent of the contract price (in addition to a price guarantee of about 3.4 percent) in 38 cases on a total of 402,879 grt. In 1982, the Government provided production aid covering between 5-30 percent of the contract price (plus price guarantees) in 26 cases on a total of 173,155 grt. Government production aid during the first half of 1983 was extended in 5 cases on a total of 104,970 grt covering 20 percent of the contract price for large- and medium ships and between 8 and 11 percent for small ships. Commission Reports to the Council on Aid to Shipbuilding, op. cit., 1982-84.

6/ Policy Guidelines, Annex I, op. cit.

7/ Journal of Commerce, Apr. 28, 1983, p. 5.

Interest on loans used to finance construction and conversion of vessels at French yards may be reduced to permit French shipping firms to benefit from financing terms comparable to those offered competing owners when the latter build or convert vessels. The conditions for reducing interest on construction or conversion of vessels at French yards are: (1) the reduced interest portion of contracted loans may not exceed 80 percent of the vessel or conversion price; (2) the maximum duration of the reduction period is 8.5 years beginning with the delivery date; and (3) the residual rate after reducing the interest is 8 percent. For used vessels purchased during 1982-83, the Government reduces interest on loans used to finance their purchase. The age of the vessel on the date of transfer of ownership must be less than 10 years, or 13 years in the case of tankers used in coastal trade. The conditions for reducing interest for used vessels are: (1) the reduced interest portion of contracted loans may not exceed 60 percent of the vessel price, plus the cost of the work required by French regulations and the requirements of commercial operation; (2) the maximum duration of the reduction period is 7 years beginning with the transfer of ownership date; (3) the residual rate after reducing the interest is 8 percent; and (4) when the vessel is purchased from a foreign owner, the owner must prove the absence of a foreign credit.

Shipping companies may take depreciation beginning with the closing of the fiscal year preceding delivery of the vessel if it was delivered prior to the date of said closing. Depreciation is calculated prorata temporis on costs incurred and paid out that date. 1/ Depreciation taken on delivery is charged against the residual value of the vessel, which serves as the basis for depreciation in future years. The useful life span used as a basis for depreciation varies between 8 and 15 years.

West Germany

Industry profile

The outlook for West Germany's shipbuilding industry is much more optimistic than it was 2 years ago, when the orderbook was thin. West Germany, like other high-wage countries, has decided that the only way to remain competitive in shipbuilding is to concentrate on highly specialized, small vessels and leave ordinary series construction to the Far East. Consequently, Germany is looking toward continuous technical innovations and new ship designs in building high quality ships for the future. 2/

The major West German shipyards and their locations are shown in the following tabulation, compiled from industry data: 3/

1/ Policy Guidelines, Annex I, op. cit.

2/ "Carving Out a Slice of the High Value Market," Marine Engineering/Log, September 1984, pp. 32-37.

3/ "Large yards chase badly-needed work to Top-up Orderbook Shortfall," Fairplay, Sept. 20, 1984, p. 53.

Firm	Location
Bremer Vulkan AG	Bremer
Hapag Lloyd	Bremerhaven
Rickmers Werft	Bremerhaven
Blohn and Voss	Hamburg
Fiensburger Schiffbau	1/
Busumer Werft	Buesum
Schlichting Werft	Travemvende
Orenstin and Koppel	Lubeck
Flender Werft AG	Lubeck
Thyssen Nordsee Nerke	Emden
Jos. L. Meyer Werft	Papenberg
New Jadewerft	Wilhelmsharen
Howaldtswerke-Peutsche Werft	1/

1/ Not available.

Only one of these shipbuilders, Howaldtswerke Deutsche-Werf (HDW) is Government owned.

Since 1975, German shipyard capacity has been reduced by 75 percent in the large shipyards and by 40 percent in the smaller ones. 1/ The biggest realignment of yards has recently taken place in the Bremer and Bremerhaven region. 2/

At yearend 1983, there were 47,000 employees in the shipbuilding industry, a reduction of 7,000 from the previous year. During 1983, there were strikes and yard takeovers by shipbuilding employees in protest of the reductions. 3/ In 1983, labor-wage compensation costs in West Germany, at $11.61 per hour, were among the highest in the world. 4/

In 1983, West Germany held 3.7 percent of the world market for shipbuilding and ranked third behind Japan and Korea for new ship orders. In spite of reductions in shipbuilding capacity in the past few years and an increase in new orders during the first half of 1984, there are serious concerns about the long-term prospects for the German shipbuilding industry. As of September 1984, capacity utilization was at 90 percent but is expected to drop to 55 percent by 1985. 5/ Orders were low at the end of 1983, totaling 601,930 gt. Of this total, 593,765 gt were delivered during the first 9 months of 1984 and new orders amounted to only 244,342 grt. Only 20 percent of total orders were for export, mostly to Third World countries. 6/

1/ Ibid.

2/ "Carrying Out a Slice of the High Value Market," Marine Engineering/Log, September 1984, p. 38.

3/ U.S. Department of Transportation, Maritime Administration, Annual Report on World Shipbuilding, 1983, 1984.

4/ U.S. Department of Labor, Bureau of Labor Statistics, Hourly Compensation Costs for Production Workers in Ship and Boat Building and Repairs, April 1984.

5/ "Large Yards Chase Badly-Needed Work to Top-up Order Book Shortfall," Fairplay, Sept. 20, 1984, p. 53.

6/ "West German Shipbuilding," Maritime Reporter and Engineering News, Sept. 1, 1984, pp. 38-42.

In 1983, new construction of all vessel types totaled 145 ships of 827,873 grt (table C-24). West German shipbuilders have generally been successful in switching from larger, less sophisticated ships to more specialized ones. However, the German industry's movement toward higher value ships has still not compensated for the loss of orders for larger ships, and the shipyards are bracing for further restructuring and cutbacks. 1/ Although there was an increase in orders during the first 6 months of 1984, it is doubtful that the yards will have enough work to maintain the current levels of employment through 1985.

Table C-24.--Commercial ships: West German production, by types, 1983

Item	Quantity	Weight
		gross registered tons
Cargo ships	46	325,455
Containerships	35	344,096
Ferries, car carriers, RO/ROS	10	33,363
Oil/products tankers	4	14,499
Gas and chemical tankers	4	33,857
Bulkers	2	32,663
Fisheries	10	2,047
Tugs	9	1,409
Offshore units (includes supply BDAP)	16	17,730
All other	9	22,754
Total	145	827,873

Source: Marine Engineering/Log, September 1984, p. 35.

Government involvement

The West German Government provides interest-rate subsidies. In 1982, the Government appropriated DM 652 million for 1984-86 under its shipyard assistance program. The current repayment period is 8.5 years with an 8-percent interest rate and a 20-percent downpayment. 2/ The States of Hamburg, Bremen, Niedersachsen, and Schleswig-Holstein provide limited credit guarantees for the purchase of merchant ships if they cannot be secured through usual ship mortgages. 3/ Guarantees are available to nonnationals placing building orders with a German yard but not available to nationals placing orders abroad.

1/ "Carving Out A Slice of the High Value Market," Marine Engineering/Log, September 1984, pp. 37-38.

2/ The Government provided interest rate subsidies between 1962-75 amounting to about DM 1.8. billion, followed by a further credit from other funds of DM 2 billion. During 1976-83, the Government provided DM 1.1 billion in low interest subsidies, supplemented by additional development funds amounting to DM 775 million. Journal of Commerce, Aug. 19, 1982, p. 5.

3/ In 1984, Bremen extended $19 million to keep a major yard open and to merge 2 other yards, since the Federal Government refused to pay the DM 230 million cost of the merger. Journal of Commerce, Jan. 16, 1984, p. 12.

The Federal Government has made loans and interest rate subsidies to German owners for financing exports under OECD credit guidelines since 1981. The interest rate subsidy of 2 to 2.5 percent applies to vessels completed between 1984-86. Export credit insurance is available to cover up to 90 percent of the risk of such credits. 1/ State Governments are providing $25.5 million in export ship subsidies for orders placed between October 1983 and December 1985, resulting in an effective contract price grant of 6 percent through 1984 and 4 percent thereafter. 2/

In addition, the Government has provided direct production subsidies to yards since 1979. Subsidies are granted in proportion to each shipbuilder's share of contract value of total German production during 1976-77. The subsidies provided 10 to 20 percent of the contract price of ships built in 1979-81. 3/ The subsidy payments to the yards are made in three equal installments--when the ship is ordered, at launching, and at delivery.

Current subsidies amount to a maximum of 12.5 percent of the cost of the vessel to be built. Subsidized ships must be engaged in international traffic, be of German registry, and fly the West German flag for at least 8 years. Subsidies are to be repaid to the Government in full if the ship is sold within 4 years after delivery with partial repayment required if the ship is sold in the following 4 years. Government appropriations for direct shipyard subsidies since 1979 have amounted to $96.2 million in 1980; $75.6 million in 1981; $94.6 million in 1982; $98 million in 1983; and $231 million in 1984-86. 4/

In terms of conversion and modernization aid, the Government made two loans in 1982 amounting to DM 30 million that covered 8.75 percent of the investment. One was for equipment modernization and the other was for diversification out of shipbuilding. Shipbuilders in Hamburg were granted $16.5 million to restructure and diversify yard activities during 1978-83. Lower Saxony granted subsidies up to DM 3 million for diversification measures out of shipbuilding. Schleswig-Holstein made available DM 64 million in restructuring and conversion aid.

In West Germany, customs duties and value-added taxes (VAT) are waived on materials imported for construction of domestic or export ships. Construction subsidies are deducted from the purchase price in calculating depreciation allowances and may be treated as a return made in the year the subsidy was paid out. 5/ Up to 80 percent of the book profits resulting from the sale of a vessel that had been owned by the selling German shipping firm for at least 6 years may be deposited in a tax-free fund that permits the tax payer to defer

---

1/ World Government Aid to Shipbuilders and Shipowners, op. cit., p. 12.

2/ Ibid.

3/ Commission Report to the Council on Aid to Shipbuilding in the EC, October 15, 1982.

4/ World Government Aid, op. cit., p. 14. In addition, the States are granting production aids to yards on a declining scale during 1984-85 for a total budget of DM 69 million. Commission Report to the Council on Aid to Shipbuilding in the First Half of 1983, Apr. 26, 1984.

5/ OECD Maritime Committee, op. cit., pp. 32-36.

for 2 years the tax liability on the profit thus gained. 1/ The money must be used toward either building or converting a vessel within those 2 years, or the gains will be taxed. This regulation is applicable when the vessels sold have been owned by the seller for not less than 6 years. 2/ The new ship's accounting value must be reduced by the amount used out of the special fund. Anticipated depreciation is allowed up to 40 percent of the advance payment of a new-built merchant vessel. The cumulative amount of anticipated depreciation on advance payments and of special depreciation 3/ is allowed to amount up to 40 percent of the purchase price. For ships purchased or constructed after 1972, a useful life of 12 years is taken as the basis for depreciation, except large passenger vessels where the depreciation limit is 16 years. 4/

Italy

Industry profile

Industry sources indicate that the prospects for Italy's shipbuilding industry are bleak. Italy's shipbuilding industry faces many problems including huge overcapacity, a very low orderbook and extremely high shipping costs. These troubles are exacerbated by already high levels of unemployment in the South of Italy and the worldwide newbuilding recession.

In 1982, merchant vessel construction was being performed only at Italcantieri and Cantiere Navali Breda yards, while the other yards were engaged in shiprepair activities. During that year, the Italian Government announced a restructuring plan for Italy's State-owned shipbuilding group, Fincantieri. According to the plan, Fincantieri would be reorganized into one company with a central headquarters and four operating divisions. Employment would be reduced and output was to be limited to 190,000 metric tons. Investments of $125 million over three years were to cover the restructuring process. Direct aid would be provided for newbuilding and conversions and similar assistance would be provided to repairers. It was hoped that guaranteed production prices would insulate shipbuilders from the world shipbuilding recession. 5/ At the end of October 1983, Fincantieri went ahead with the first stages of the plan and layed off 3,500 workers. 6/

1/ If a replacement vessel has been purchased or completed not later than 2 years after such sale, or if construction has started less than 2 years and completed less than 4 years after such sale, the taxpayer may deduct the amount of that tax-free fund from the purchase price of such vessel or from expenses for major conversion. Tax payment may be differed and depreciation is calculated upon the price so reduced.

2/ World Government Aid to Shipbuilders and Shipowners, op. cit., p. 12.

3/ The latter of which may be used in the year of delivery and the following four years.

4/ Special depreciation is allowed up to 40 percent of the purchase price which may only be used in the year of delivery of the four following years if the ship remains registered in the shipping register of the FRG for not less than 8 years after the purchase or construction. Depreciation may not go below the fixed value of the vessel's (DM 40 per grt).

5/ "Italy's Marine Industry," Fairplay, October 1984, pp. 23-25.

6/ U.S. Department of Defense, Coordinator of Shipbuilding, Conversion and Repair, Annual Report on the Status of the Shipbuilding and Ship Repair Industry of the United States, 1983, December 1984, p. 5-8..

In 1984, the Government announced it would implement another restructuring project. The seven largest State-owned shipyards and the largest Italian marine and industrial engine manufacturer will be merged to form a new company, Fincantieri-Contieri Navali Italiana. A Merchant Shipbuilding Division will be based in Trieste, and a Naval Ships Division will be located in Genoa, along with a Shiprepair Division.

In spite of the negative outlook for new building in Italy, the ship repair sector has managed to attract some sophisticated conversion work and offshore business requiring specialized worker skills. Even though they have been able to attract a steady amount of repair business, Italian yards are generally overmanned and facing increasing price competition from neighboring countries. 1/

During 1983, Italy's shipyards did not receive a single order for a merchant ship 5,000 dwt and over in size. In 1984, Italy's yards received orders for nine vessels totaling 39,440 grt. 2/ Of this amount, 24,000 grt was for two general cargo ships for foreign export, and the remainder was for small cargo ships, or miscellaneous vessels for domestic account.

One of the most serious consequences of the long shipbuilding recession has been the loss of Italian ship designers to overseas companies. Ten years ago there were 25,000 workers producing 1 million grt per year. In 1984, there were 15,000 workers engaged in shipbuilding with an orderbook of about 50,000 grt and this included a large excess of employees. 3/ Average hourly wage costs increased from Lit 12,700 in 1982 to Lit 14,900 in 1983, an increase of 17 percent. In dollar terms, however, wage costs only went from $9.35 per hour to $9.86 per hour. 4/

In 1983, Italy completed 10 vessels for a total of 174,730 grt, of which 77 percent or 135,000 grt was for foreign account. The approximate value of ships completed during 1983 was $226 million. The total value of the orderbook at the end of 1983 was $512 million.

Government involvement

Domestic owners may obtain loans to cover 70 percent of new ship construction, modernization, or repair with repayment made over a 15-year period at a discounted annual rate that is reviewed biannually. The Government offers an interest rate subsidy of 2.75 percent for new construction and conversion projects. 5/ Operating subsidies have been

---

1/ "Italy's Marine Industry," Fairplay, October 1984, pp. 23-25.

2/ Includes conversion figure according to revisions to 1977 IMO Convention on Tonnage Measurement of Ships.

3/ Op. cit., "Italy's Marine Industry," pp. 23, 25.

4/ U.S. Department of Transportation, Maritime Administration, Annual Report on World Shipbuilding, 1983.

5/ A more limited facility is provided for the purchase abroad of second-hand vessels less than 10 years old, provided they do not exceed 10,000 grt. For secondhand tonnage acquisition, the interest rate subsidy is fixed at 1.88 percent and is paid to the owners biannually over 10 years. The subsidy is limited to vessels under 10,000 grt and less than 10 years old. Owners who scrap vessels and contract to build new tonnage, amounting to at least 50 percent of the scrapped vessel's tonnage, may obtain a subsidy of up to Lit 50,000-100,000 for each gross ton scrapped, depending on the age of the older ships. This program expired in December 1983.

granted since 1974 to the State-owned FINMARE group of 17 shipping lines when new services or the maintenance of old ones are required by the national economy. These include mainland-islands service required by the State. 1/ The Government also provides production aids that are set at rates of 26 percent of the contract price for large yards and 8.5 percent of the contract price for small yards in 1983. The 1982-83 budget allocation for this purpose was Lit 990 billion.

In 1982, the Government provided investment aid of Lit 14 billion on 10 percent of investment for programs that reduce capacity. Aid is available for repair, conversion, and modification projects valued at more than $52,600. The subsidy declines with the size of the yard, starting at 10 percent of the contract price. Yards considering restructuring are granted a 20 percent subsidy, provided the restructuring costs exceed a certain level. The Government also has a price guarantee program by which it pays between 5 and 15 percent of the cost overrun between order and delivery. The premium is within the range of 0.1 to 1.25 percent of the cost of the ship. This scheme applies only to exports. Customs duties are waived on material and equipment imported for shipbuilding, conversion, and repair of ships. All ships are exempt from the VAT.

The Netherlands

Industry profile

Industry sources indicate that shipyards in the Netherlands are as modern and competitive as any in the world. In 1983, repair yards were working at close to full capacity. However, during the last year, there have been fears of cutbacks and closures within the industry. The Netherlands was hit harder by the recession than many other countries, and unemployment has climbed. The Government has been attempting to restructure the industry by trimming back on capacity and increasing productivity at the same time.

The Netherlands' shipyards build and repair ocean-going vessels and offshore structures as well as small sea-land vessels for inland navigation. Most of the yards belong to CEBOSINE, the Netherlands Shipbuilding Association. As of 1983, CEBOSINE had 80-member companies operating at 98 yards. Of this total, 70 yards were involved in the construction and repair of smaller vessels. The largest privately owned shipyard in Holland is Boele's Scheepswerven en Machine fabriek. In recent years, the yard has focused solely on repair and conversion work. 2/

In 1983, there were 34,200 employees in the Netherlands' shipbuilding industry. Of this total, half were engaged in new building and 11,000 were involved in repair work. The following tabulation shows that total employment in the Netherlands' shipbuilding industry dropped by 14 percent during 1979-83: 3/

1/ Commission Report to the Council on Aid to Shipbuilding in the First Half of 1983, Apr. 26, 1984.

2/ "Netherland's Maritime Industries," Marine Engineering/Log, October 1983, p. 73.

3/ Ibid, pp. 82-83.

Year	
1979	39,000
1980	35,800
1981	34,400
1982	34,200
1983	34,200

Wage increases in the Netherlands' shipbuilding industry rose (in guilders) during 1979-82, but fluctuated in dollar terms due to exchange rate changes, as shown in the following tabulation: 1/

Year	DG	US$
1979	23.84	$ 11.89
1980	24.93	$ 12.56
1981	25.59	$ 10.28
1982	27.28	$ 10.21
1983	1/	2/ $ 10.57

1/ Not available.
2/ Estimated by the staff of the U.S. International Trade Commission on the basis of data provided by the U.S. Department of Transportation, Maritime Administration.

The industry delivered 120 ships in 1983 compared with 71 in 1979. Annual shipbuilding activity during the 5-year period is shown in the following tabulation. In 1983, there were six general cargo ships built, 3 product carriers, 2 reefers, 1 container ship, 1 LPG carrier, 24 small cargo ships, and 83 miscellaneous vessels. 2/

Year	Number	Tonnage (in grt)
1979	71	245,981
1980	67	111,355
1981	75	144,150
1982	101	202,850
1983	120	199,920

Government involvement

The Government offers interest rate subsidies of up to 2 percent on all sales (3.5 percent for small ships). State guarantees are available in certain cases to domestic owners who obtain commercial loans for investment purposes. Export credits may be obtained through insurance from privately owned firms and are reinsured by the Government. The Government has

1/ U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, Hourly Compensation Costs For Production Workers in Ship and Boat Repairing, 1975-82, April 1984.
2/ Association of West European Shipbuilders, Survey of the Shipbuilding

historically provided direct subsidies for ship construction at 15 to 20 percent of the contract price. State expenditures for direct subsidies to the shipbuilding industry amounted to $100.5 million in 1980; $70 million in 1981; $50.2 million in 1982; and $31 million in 1983.

Customs duties are waived on material imported for construction of both domestic and exported ocean-going vessels. Value-added taxes are waived on material and services involved in construction and repair. Construction subsidies must be deducted from the purchase price. Book profits resulting from the sale or loss of a vessel may be deducted from the purchase price of the replacement vessel, and tax payment may thus be deferred, since the depreciation is calculated upon this reduced price. 1/

Because of the recession, the Government is cutting back on its support for the shipbuilding industry. In 1985, the Government will discontinue direct subsidies to shipyards. In 1984, each shipyard received a subsidy fixed at 2 percent of its annual turnover from 1977 to 1979. The interest support system as of March 1984 was designed to bring export credit in line with OECD terms. An interest subsidy of 2 percent may be granted on 80 percent of the contract price (of vessels more than DG 5 million) for a period of 8.5 years at a minimum effective interest rate of 8 percent. For vessels of less than DG 5 million, an additional interest subsidy of 0.5 percent may be granted. 2/

The United Kingdom

Industry profile

One hundred years ago, Britain was the world's leading shipbuilding nation, producing 80 percent of the world's merchant ships. 3/ Today, following a century of growth and recession within the industry, the United Kingdom claims only 1 to 1.5 percent of the world market for shipbuilding. 4/

British Shipbuilders Corporation (BS) and its 20 yards account for over 85 percent of Britain's merchant shipbuilding. The firm was nationalized in 1977. The remainder is built by Harland and Wolff, which is also nationalized (since 1974) and under the control of the Northern Ireland Office.

1/ In 1981, the Government granted production aid in 47 cases on a total of 200,428 grt covering between 16-24 percent of the contract price. During 1982, the Government granted production aid in 30 cases for a total of 625,000 grt covering between 15-25 percent of the contract price. During the first half of 1983, the Government granted production aid in 12 cases for a total of 7,961 grt covering between 13-22 percent of the contract price. Commission Report to the Council on Aid to Shipbuilding in the First half of 1983, Apr. 26, 1984.

2/ World Government Aid to Shipbuilders and Shipowners, March 1984.

3/ Admiral Sir Anthony Griffin, "A Maritime Strategy for Britain," North East Coast Institution of Engineers and Shipbuilders Transactions, April 1984, p. 99.

4/ "BS to Concentrate on Smaller Tonnage," World Shipbuilding/U.K., Aug. 21, 1984.

In 1984, the Government announced the sale, within 2 years, of all British Shipbuilders' Naval Warship Yards to allow the corporation to concentrate on merchant shipbuilding. The Government hopes to raise cash and increase competition for naval contracts; however, it was criticized for relinquishing support for the shipbuilding industry and for selling of BS's only profitable division. If the plan is implemented as scheduled, by March 1986, BS will consist of 6 yards employing about 15,000 people, compared with 47,000 workers as of June 1984. 1/

Harland and Wolff, at Belfast, is the only remaining integrated shipbuilding and engineering company in the United Kingdom. In addition to shipbuilding and ship repair, Harland and Wolff has a large engineering division which markets its skills in the manufacture of cranes, pressure vessels, loading ramps, offshore fabrications, and electrical equipment. 2/

During fiscal year 1983, employment at BS fell by 22 percent to 48,550 workers, with threats of more cuts to come. Data are not available regarding employment in the yards of the other British shipbuilder, Harland and Wolff. British shipyards have a long history of labor problems. A recent example of this occurred in 1984, when 7,500 workers at one shipyard staged a ban on overtime because of a warning that 2,000 jobs would be cut in 1985. 3/ Wages for British shipyard employees rose (in pounds) during 1979-82, as shown in the following tabulation: 4/

	Wages (in pounds)	Wages (in dollars)
1979	2.70	5.74
1980	3.17	7.38
1981	3.56	7.21
1982	4.29	7.49

Data are not available for wages in 1983 and 1984.

The two major ship-repair firms are Tyne Shiprepair Ltd. and Humble. Both firms are also engaged in repair and conversion activities for the British Navy. Tyne Shiprepair is currently seeking orders from Danish and German owners and hopes to concentrate on large refits and sophisticated conversion contracts. 5/

The number of commercial vessels built by British shipbuilders decreased from 54 ships (547,378 grt) in 1979 to 33 (460,595 grt) in 1983, as shown in the following tabulation:

1/ "BS to Concentrate on Smaller Tonnage," World Shipbuilding/U.K., NSN, Sept. 21, 1984, pp. 58-61.

2/ "Setting Course for the Future," Engineering, December 1984, pp. 875-877

3/ "UK's Swan Hunter Shipyard Faces Management Buy-out," Journal of Commerce, Nov. 7, 1984, p. 1B.

4/ U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, Hourly Compensation Costs for Production Workers in Ship and Boat Building and Repairing, April 1984.

5/ "Flying Start for Tyne Yard in its First Month of Private Ownership," Fairplay, March 1984, p. 45.

	Number of ships	Tonnage (in grt)
1979	54	547,378
1980	57	405,726
1981	25	306,226
1982	32	354,882
1983	33	460,595

The value of this production in 1983 was 370 million pounds. There were 12 bulk carriers constructed, 2 crude oil tankers, 2 general cargo ships, 2 small cargo ships, 1 product carrier, 1 ro/ro vessel, and 13 miscellaneous commercial ships. Approximately 40 percent of these ships built in 1983 were for export. 1/ Table C-25 shows that 43 percent of the total number of vessels on order for British shipbuilders as of October 1984 were bulk carriers (including combination carriers). Data are not available regarding the value of repair activities in British shipyards during 1979-84.

Table C-25.--Commercial ships: United Kingdom orders, by types, as of Oct. 31, 1984

Item	Quantity	Tonnage
		Dwt
Dry cargo	8	93,000
Bulk carriers	6	179,250
Tankers	0	0
Total	14	272,250

Source: World Ships on Order, Fairplay, October 1984.

In fiscal year 1983, BS, which accounts for over 85 percent of Great Britain's shipbuilding activity, suffered record loses of $212.4 million, even with Government subsidies of $14.9 million. In fiscal year 1982, it incurred a loss of $155 million, and Government aid amounted to $26.9 million. 2/

Government involvement

The British Government's Home Credit Scheme provides guaranteed credit on OECD terms and an interest rate of 8 percent for a maximum of 80 percent of the contract price. Government funds are also provided to the Sea Fish Industry Authority to make loans to British shipowners for purchase of fishing vessels up to a maximum repayment period of 20 years. Loans may amount to

1/ The Association of West European Shipbuilders, Survey of the Shipbuilding Industry, various years 1979-83.

2/ "British Shipbuilders Suffers Record Losses," Journal of Commerce, July 26, 1984.

50 percent of the total cost of the vessel. Interest rates fluctuate with market rates. Grants and loans together may not exceed a total of 75 percent of approved costs.

Government grants of 25 percent of the contract price are also available to fishing vessel owners for construction or improvement of fishing vessels but are restricted to owners engaged in the British fishing industry. Grant assistance is available irrespective of where the vessels are built, but if built abroad, construction costs must compare favorably with those in British yards. In the year ending March 1982, fishing vessel grants amounted to £6.0 million and loans amounted to £3.2 million. Government guaranteed loans are available for domestic vessels and mobile offshore projects to be built in home yards. Loans are about equal to prevailing OECD guidelines, but sometimes are more generous. Subsidies total $20 million annually and are granted to domestic owners who operate certain island/mainland trade routes. The Government also offers preferential credit for export sales.

The nationalized industry is operated by British Shipbuilders Corporation (BSC). The Intervention Fund, which finances BSC, was established to help builders compete in foreign markets by furnishing them with construction subsidies that in 1977 ranged up to 38 percent of the contract price. 1/ Since 1977, however, subsidy levels have been systematically reduced to the current rate of 15 percent of the contract price. The annual amount of Government subsidies under the Intervention Fund was $156 million in July 1977-March 1978; $204 million in April 1978-March 1979; $156 million in July 1979-July 1980; $132 million in July 1980-July 1981; $81 million in July 1981-July 1982; and $68 million in July 1982-July 1983. 2/

In addition to Intervention Fund assistance, BSC is financed by public dividend capital. The limit on this was set at $182 million, including the Intervention Fund, for the fiscal year ending March 1983. The Intervention Fund is also used to provide support for Harland and Wolff, a yard in Belfast, even though it is not a BSC member. The Government's total aid to the yard during 1975-80 was $303 million. During July 1982-July 1983, the Intervention Fund allowance was $15.1 million. The subsidy fund allowed grants of 15 to 18 percent of the contract price, depending on the amount of the contract.

Construction subsidies must be deducted from the purchase price. New vessels ordered from domestic or foreign shipyards are exempted from taxation during the year of delivery. The Government has a single refund of certain taxes (shipbuilder's relief) that amounts to 2 percent of the construction costs. In order to offset the costs of certain indirect taxes, rebates of 2 percent of the value of ships are granted on delivery, and vessels over 15,000 grt are exempted from paying a VAT.

Research and development is largely concentrated at the British Ship Research Associates, which is independent of BSC but derives 60 percent of its revenue from BSC. 3/

1/ World Government Aid to Shipbuilders and Shipowners, op. cit., p. 34.

2/ World Government Aid, op. cit., p.34.

3/ "British Maritime Industries," Marine Engineering/Log, September 1982, pp. 85-97.

Government Aid to the Commercial Shipbuilding and Ship-Repair Industries of the European Community

In addition to the involvement of the government of the individual country in its domestic shipbuilding and ship-repair industry, the member countries of the European Community 1/ also receive assistance, as discussed in the following sections.

State aid for the maritime industries of the members of the European Communities are subject to a code of aids--called the Fifth Directive on Government Aid to Shipbuilding--that specifies permissible and unlawful government aid. Under certain terms, to promote restructuring and rationalization of the European industry, the Directive allows "temporary" exceptions to the EC's strict ruls of competition. It enables members to provide certain subsidies to their domestic shipbuilding and ship-repair industries. However, the European industry is currently encountering its most severe recession on record. Productivity, new building orders, efficiency, demand, world market shares, and prices are down, while labor and production costs, unemployment, and stiff competition from the Far East are up. The EC has consequently renewed the aids code on several occasions to enable the European industry to continue to receive extraordinary state aid.

Parallel to the Fifth Directive is the set of guidelines on state aid to the industry under Working Party No. 6 of the Organization for Economic Cooperation and Development (OECD). 2/ Three accords have been designed to moderate the effects of the industry crisis through cooperation among members. The Working Party monitors participants' adherence to these accords. This section reviews EC and OECD provisions dealing with the industry crisis and the approved measures taken by the EC members to support their domestic industries within the context of EC rules and OECD guidelines.

OECD guidelines on state aid to members' shipbuilding industries

General Arrangement for the Progressive Removal of Obstacles to Normal Competitive Conditions.--The 1975 General Agreement, as amended, aims at reducing the following obstacles to normal competitive conditions in the industry: government subsidized export credits, direct building subsidies, customs tariffs or any other import barrier, discriminatory tax policies and official regulations or internal practices, specific aid for investment in and restructuring of domestic industry, and all other forms of indirect public aid. Members agree not to introduce any new measures of assistance or to increase existing assistance unless for "imperative reasons." Under such conditions, members whose aid deviates from the Agreement must first inform the OECD. Assistance must be for a short duration and accompanied by remedial action. Participants may request information on assistance levels and restructuring plans from other members. Any government may match assistance given by another if it is incompatible with the General Agreement.

1/ Maritime members of the EC include Belgium, Denmark, France, Ireland, Italy, Netherlands, West Germany, and the United Kingdom (U.K.).

2/ EC members of the OECD Working Party on Shipbuilding include the countries listed above.

General guidelines for government policies in the shipbuilding industry.--The 1976 guidelines, as amended, provide a broad voluntary framework of cooperation. Participants agree to make structural changes that are equitable and least damaging to the international industry and to seek to restore normal and balanced market and competitive conditions. Participants are committed not to take measures nor give aids to the industry that would disturb the process of adaptation. They agree to refrain from taking measures to create new capacity and to keep each other informed of new measures.

Understanding on export credits for ships.--This 1969 accord, as amended, sets limits on government credit aid to the industry. For contracts regarding any new sea-going ship or conversion of a ship negotiated after 1979, member governments have agreed to abolish existing official facilities 1/ and to abide by the following export credit terms: (1) loan repayment periods not to exceed 8.5 years from delivery, and repayment by equal installments at regular intervals; (2) payment by the receipient of no less than 20 percent of the contract price on delivery; and (3) an interest rate not less than 8 percent net of all charges.

EC rules governing state aid to shipbuilding

EC antitrust and competition law.--EC rules forbid agreements between firms that seek to restrict intra-EC competition. Shipbuilding firms seeking mergers must pass the EC's scrutiny to determine if such actions violate EC competition rules. Under EC law, state aid 2/ that favors certain firms or production of certain goods is incompatible with the common market if it distorts intra-EC trade. Article 92 outlines which state aid is compatible with the common market. 3/ Article 93 authorizes the Commission--the EC's administrative arm--to review members' aid for its compatibility with the standards of the common market. The Commission may order a member to abolish or alter an aid provision. Noncompliance is referred to the EC Court of Justice for adjudication. 4/ The Commission is not always successful in enforcing article 92. Some subsidies may escape its scrutiny or may by implicitly tolerated. For distressed industries where extensive state aid is granted, the Commission has developed codes of aid that define permissible subsidies. Without aid codes regulating state aid for these industries, much

---

1/ Official facilities are those that enable credits to be insured, guaranteed, or financed in whole or in part by by governments.

2/ State aid includes aid granted by central, regional and local governments and includes financing measures taken by member governments for firms that they directly or indirectly control.

3/ These include economic and social development aid in depressed areas and aid to promote projects that benefit common interests or remedy disturbances in a member's economy. Under EC rules, state aid must not lead to increased production capacity; must be limited to individual cases where it is justified by the circumstances; must be progressively reduced; must be linked to restructuring; and must not transfer an industry or employment problem from one member to another. The amount of aid must be proportionate to the problem it is designed to resolve to minimize distortions to intra-EC competition.

4/ For more information on EC competition and industrial policies, see Foreign Industrial Targeting and its Effects on U.S. Industries: The European Community and Member States, USITC Publication 1517, April 1984.

of the aid would be illegal under EC laws of competition. The aid codes are designed to allow governments to provide certain temporary subsidies to troubled industries. Shipbuilding is one such industry. When they expire and are not renewed, the EC's strict competition rules regulating aid are enforced.

Fifth Directive on Shipbuilding.--Because of depressed economic conditions facing the industry, the Commission permits certain state aids for individual firm thus allowing member governments to skirt the EC's normal competition rules. The goal of the Fifth Directive on state aid is to "maintain a healthy and competitive industry whose scale of activity should be consistent with the size of the EC's seaborne trade and respect its economic, social, and strategic importance." 1/ Through the aid code, the Commission concentrates on minimizing national aid levels and requires that it be granted only if it contributes to necessary restructuring. The Commission monitors members' efforts to cut capacity to ensure that the burden of the crisis is shared equitably. It has authorized members to grant aid for limited periods under certain guidelines. Aid that increases capacity rather than productivity is forbidden. A description of its provisions follows:

(1) Aid in the form of credit for sales or conversion of vessels is compatible with the common market if it complies with the OECD guidelines.

(2) Members are prohibited from granting sectoral aid for the creation of new shipyards or for investment in existing yards if it would increase building capacity. Member governments that plan to extend general or regional aid that could increase capacity must notify the Commission not less than 30 working days before the aid is put into effect. Members must inform the Commission of their decisions to grant aid for investments in shipbuilding, ship-conversion, or ship-repair yards if the investment exceeds 5 million European Currency Units (ECU's).

(3) Rescue aid intended to maintain a shipbuilding, ship conversion, or ship repair undertaking is compatible with the EC's competition rules under this directive if designed to alleviate social and regional problems.

(4) To deal with the social and regional consequences of restructuring, aid to cover the normal expenditures for conversion to other sectors or by partial or total closure of building or repair yards is compatible with the common market. Members must supply the Commission at its request with any pertinent information.

(5) Production aid is compatible with the common market if it is granted to deal with the effects of a crisis characterized by a poor order situation leading to substantial underutilization of the means of production. Such aid must be progressively reduced, granted only if linked to the attainment of restructuring objectives that will make

---

1/ "Council Directive on Aid to Shipbuilding," Official Journal of the European Communities, No. L137, pp. 39-43, May 23, 1981. The Fifth Directive was adopted by the Council--the EC's decisionmaking arm--in April 1981.

the industry competitive, and capable of operating without state aid. 1/

(6) Aid granted to owners in a member state linked to acquisition of new ships may not lead to distortions of competition between national yards and yards of other members. If the Commission detects violations it will examine the entire aid provided by the member for building, sale and acquisition of ships. When aid is granted to national owners on a selective basis, the member must provide information on the total tonnage of orders receiving aid and the share of this total that has been placed in national yards. The aid volume must be shown in each case. These reports must be discussed with the other members to ensure that there is no discrimination as a result of such aid.

((7) Members must notify the Commission of their aid plans before they are put into effect. Aid may not be given before the Commission has given consent. Members must supply information on decisions taken during the previous 6-month period and must regularly provide the Commission with a report on the attainment of their restructuring objectives and show the results obtained by the application of aid granted under this directive.

Renewal of the Fifth Directive.--The Directive was due to expire at yearend 1982 but was renewed until yearend 1984. Worsening industry conditions prompted the EC to extend the Directive until yearend 1985. The Commission has proposed to the Council that the Directive be extended for another 2 years until yearend 1987 at which time a new directive will be put into effect.

Subsidies/Financing Policies

The EC provides small amounts of loans and grants to aid shipbuilding, ship-repair, and/or conversion projects through the European Social Fund (ESF), the European Regional Development Fund (ERDF), the European Investment Bank (EIB), and its R. & D. programs. 2/ The EC also offers aid to fishing boat owners. Funds for these programs derive from the EC's operating budget.

1/ The Commission verifies that a member's adaptation program is comparable to those carried out by other members and assesses the maximum aid level that may be granted. Authorization to exceed this level may be given only as an exceptional measure--after the Commission has been notified. The Commission must be given prior notice of any proposed individual aid where such aid is in competition with a tender from a yard of another member and must adopt a position within 30 days after notification. Such proposals may not be implemented before the Commission has given its consent. It verifies that such aid does not distort intra-EC trade. Members must supply the Commission with a report on the effects of the aid granted. The Commission verifies that the members' efforts to restructure and adapt have been genuinely applied.

2/ EC R & D aid is focused on high-tech sectors and provided to firms whose research is beyond the individual members' financial means. While shipbuilding firms have access to certain EC R. & D. funds, the EC does not publish specific aid amounts to individual firms or to the industry as a whole.

EC aid to fishing boat owners.--The EC funded 30 million ECU's in 1982 in a temporary scheme to offer incentives to fishing boat owners to build or modernize certain types of craft. From 1971-77, EC assistance amounted to 62 million ECU's for 347 vessels. From 1978-81, EC assistance amounted to 66 million ECU's for 1,112 vessels.

European Social Fund.--The ESF improves job opportunities for workers by financing reemployment and resettlement. The EC approved applications for aid from the shipbuilding industry for $16 million in 1980 and $10.6 million in 1981. 1/ Funds totaling 17 million ECU's were expended during 1980-82 for Italian projects. Under the European Coal and Steel Community, the EC approved loans to West Germany (4 million ECU's) and to Italy (22 million ECU's in 1980.) France and Italy received aid from the Fund in 1981 to improve working conditions. In 1980-82, 9,500 Italian and British yard workers were aided by 20 million ECU's from the Fund to save jobs or retrain redundant workers.

The European Regional Development Fund.--The ERDF grants aid to members by partially reimbursing them for their own regional expenses. It supports, coordinates, and steers members' regional policies for the EC's benefit as a whole. The Fund's impact on shipbuilding has been minimal. Aid granted to shipbuilding projects during 1975-82 amounted to $4.0 million or just 3 percent of total allocated funds (table C-26). 2/

Table C-26.--European Regional Development Fund assistance to the shipbuilding and ship repair industries of the European Community, by countries, 1975-82

Country	Number of projects	Aid granted
		Million ECU's
France	12	1.4
West Germany	7	1.0
Denmark	5	.6
Italy	3	.5
United Kingdom	3	.4
Netherlands	1	.5
Belgium	1	.3
Ireland	1	.1
Total	33	4.8

Source: Commission of the European Communities, July 1983.

1/ Policy Guidelines, op. cit., p. 11.
2/ European Report, July 6, 1984, p. 9.

Additional ERDF funds are available to regions particularly hard hit by the shipbuilding crisis. Some regions in the U.K. were designated for such purposes and allocated 17 million ECU's over 5 years. 1/

European Investment Bank.--EIB provides loans for industrial and infrastructure investments in the EC member states. However, because it considers shipbuilding and ship repair to be high risk sectors, it has not provided many loans. Prior to 1975, the Bank assistance totalled 12.23 million ECU's for yard investment in Italy and Denmark. From 1975-83, the Bank granted 34 loans totaling 125 million ECU's to finance investment of small building and repair enterprises. Loans were granted to Denmark (590,000 ECU's for 2 projects); France (930,000 ECU's for 4 projects); Greece (70,000 ECU's for 1 project); Ireland (1.1 million ECU's for 12 projects); Italy (11.3 million ECU's for 14 projects); and the U.K. 926,000 ECU's for 1 project).

Impact of EC involvement in commercial shipbuilding and ship repairing

The OECD guidelines have not been very effective in restraining governments from using subsidies to maintain yards and jobs. An informal system of checks and balances among the participants is the only limiting factor. However, if one participant provides aid that is not covered by the guidelines, others may match such aid, thus creating a cycle of continuing state support. EC rules carry more weight because they are enforced by law. Although the EC has not been very successful in reviving the industry, EC rules place brakes on some of the most offensive types of state aid, especially that which gives an unfair competitive edge to an industry of one member over counterparts of other members. However, given the deepening crisis facing the industry, the EC may be less stringent in enforcing subsidy rules than it is with other industries subject to the same rules. The aid code will probably be renewed until yearend 1987, at which time a new directive will likely follow, thus suggesting that the EC industry will continue to enjoy substantial EC-sanctioned state intervention well into the next decade.

The Commission believes that the Fifth Directive has enabled shipyards to maintain a minimum workload because of state aid. 2/ The Commission observes that restructuring has differed among the members in the amount and type of capacity reduction. In certain cases, the Commission has noted that production capacity "has been mothballed rather than dismantled. Not all members have put into effect overall restructuring plans aimed at the elimination of the least viable yards (as is expected under the terms of the aids code)." 3/ The Commission concludes that restructuring efforts to date have been insufficient and the competitiveness of EC shipyards has not substantially improved. Restructuring of the industry faces a bleak future because some members believe that they have already made substantial sacrifices and will not agree to further employment cuts and yard closures.

1/ The Fund's non-quota section can award grants totalling 17 million ECU's over a 5-year period for operations contributing to overcoming constraints on the development of new economic activities in certain zones adversely affected by restructuring of the shipbuilding industry.

2/ Policy Guidelines for Restructuring the Shipbuilding Industry, Report by the Commission, Mar. 24, 1984, p. 10.

3/ Ibid., p. 11.

Finland

Industry profile

Finland, like many other small ship-building nations was not severely affected by the oil crisis in the mid 1970's because it did not become involved in tanker building. In the late 1970's, Finland was already producing specialized vessels using innovative technologies. At that time the shipbuilding industry underwent a comprehensive structural rationalization, during which large industrial concerns took over some of the smaller privately owned yards. Two new yards were built in addition to a heavy engineering works, where oil drilling ships and rigs are now built. Extensive rationalization and modernization was carried out in the older yards as well so that Finland has the advantage of relatively new and competitive yards compared with other European countries. 1/

There are four Finnish companies involved in shipbuilding - Hollming Ltd., Rauma-Repola Oy, Valmet Oy, and Oy Wartsila Ab. Valmet-Oy is the only state-owned shipbuilding corporation and is the country's largest ship repairer. The other three firms are privately owned. These four companies maintain Finland's ten largest shipyards.

Employment in Finland's shipbuilding and repairing industry has remained fairly stable during 1979-84 (table C-27). In 1984, the number of persons employed in shipyards totaled 18,000, a 13-percent increase over the 1979 figure. Wages paid increased from an estimated 12.3 million marks in 1979 to an estimated 13.3 million markks in 1983 (the latest year for which data are available). Finnish industry sources indicate that by retaining trained workers during periods of low economic activity the shipyards have actually saved money, because they did not have to incur costly retraining expenses for new employees. Hourly wages paid to production workers increased annually during 1979-82 as shown in the following tabulation: 2/

	Wages in markks	Wages in dollars
1979	29.45	8.17
1980	32.53	8.75
1981	36.18	8.38
1982	39.23	8.16

1/ Data provided by the Association of Finnish Shipbuilders, 1984.

2/ U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, Hourly Compensation Costs for Production Wrokers in Ship and Boat Building and Repairing, April 1984.

Data for 1983 and 1984 are not available.

Table C-27.--Employment and wages in Finland's shipbuilding and ship-repair industries, 1979-84

Item	1979	1980	1981	1982	1983	1984
Employment	16,000	17,000	17,000	19,000	18,000	18,000
Wages paid-million marks	12.3	13.0	13.2	14.1	13.3	1/

1/ Not available.

Source: Estimated by the staff of the U.S. International Trade Commission on the basis of information supplied by the Association of Finnish Shipbuilders and the Embassy of Finland.

Deliveries of Finnish-built ships fluctuated during 1979-84, falling from 300,000 grt to 286,000 grt (table C-28). In value terms, deliveries rose from $763 million in 1979 to $1.1 billion in 1983 (data not available for 1984).

Table C-28.--Commercial ships: Finland's deliveries, 1979-84

Year	Weight	Value
	Gross registered tons	Million dollars
1979	300,000	763
1980	225,000	946
1981	260,000	814
1982	260,000	1,041
1983	312,000	1,109
1984	1/ 286,000	2/

1/ Data for January-September 1984.
2/ Not available.

Source: Data supplied by the Association of Finnish Shipbuilders and the Embassy of Finland.

The industry had orders for 61 ships (587,818 grt) as of September 30, 1984 (table C-29).

Table C-29.--Commercial ships: Production orders in Finland, by shipyards, as of Sept. 30, 1984

Item	Number of vessels	Weight gross registered tons
Hollming Ltd., Rauma	8	39,600
Rauma-Repola Oy:		
Rauma Shipyard	8	94,755
Uusikaupunki shipyard	2	4,100
Savonlinna shipyard	6	1,510
Valmet Oy Helsinki Shipyard	6	114,000
Valmetin Laivateollisus Oy	9	23,853
Turku:		
Oy Waitsila Ab:		
Helsinki Shipyard	10	128,800
Turku Shipyard	12	181,200
Total	61	587,818

Source: Official statistics of the Association of Finnish Shipbuilders and Government of Finland, Embassy in Washington, D.C.

About half of Finland's production goes to the Soviet Union. 1/ Since 1952, Finland and Russia have signed bilateral trade agreements under which Russia negotiates with individual Finnish shipyards on the price of vessels. This arrangement has been advantageous to both countries. The Soviets, who pay for the Finnish ships with oil and other commodities do not have to give up foreign currency, while at the same time, they receive access to Western technology. The Finnish industry also supplies the Russians with state of the art ice breakers and cargo-carrying vessels for operation in their icy northern waters. 2/ Finland's shipyards expect the other 50 percent of their output to go to Western countries and the domestic market. Most of these sales will be vessels for liner services and special construction.

Government involvement

According to industry sources, the Government of Finland provided construction subsidies to the domestic shipbuilding prior to 1980. In 1978 and 1979, 70 million markks ($18.0 million) was allocated for these subsidies, although only 63 million markks ($16.2 million) was actually expended. There were no budget authorizations for construction subsidies during 1980-84. 3/

1/ Association of Finnish Shipbuilders, 1984.

2/ "How Shipbuilding Flourishes with the Finnish," Marine Engineering/Log, October 1984, pp. 44-54.

3/ U.S. Department of Transportation, Maritime Administration, Maritime Subsidies, February 1983, pp. 41-43, and U.S. Department of Transportation, Maritime Administration, World Government Aid to Shipbuilders and Shipowners, March 1984.

The Finnish Export Credit Ltd., within the OECD guidelines for interest rates discussed earlier in this report, offers financing for commercial vessels, purchased by foreign shipowners. Also the Export Guarantee Board provides cost guarantees against losses because of cost escalations for ships constructed for export. Guarantees are also provided against commercial and political risk. 1/

Another measure of assistance to the Finnish shipbuilding and repair industry is provided in their acquisition of foreign goods for vessel construction. Materials and components imported into Finland for use in the production of commercial ships exceeding 33 feet in length are exempt from customs duty. These goods are also exempt from Finnish turnover tax. 2/

Sweden

Industry profile

In 1975 Sweden was the second largest shipbuilding country in the world. By 1984 however, Sweden accounted for only 2 percent of total world output. 3/ Shipbuilding capacity has been reduced significantly during this period. Since 1975, yard capacity has been reduced by 80 percent. 4/

In 1977 Sweden's shipyards were nationalized and the group Swedyards (Svenska Varv) was formed. In 1984, Swedyards represented 90 percent of the country's shipbuilding capacity. At the beginning of 1984, however, there were only two merchant building facilities: Vldevallavaret in Uddevalla and Kolkums in Malmo. In December 1984, Svenska Varv announced that it would close the Vldevalla yard in early 1986. 5/ There are repair facilities in Gothenberg and Stockholm, an offshore building facility, Gotaverken Arendal, and a naval building and repair yard at Karlskrona. 6/

There are few data available regarding the number of employees in Swedish shipyards. It is estimated that there were 9,450 workers engaged in shipbuilding and ship repair in Sweden in 1984, compared with 13,000 in 1981. 7/ Industry sources indicate that employment is expected to continue declining. The hourly wages paid to the production workers in these shipyards increased annually during 1979-82 (the latest year for which data are available), as shown in the following tabulation: 8/

1/ Ibid.

2/ Ibid.

3/ "Swedish Shipyards Look Forward to a Smaller But Profitable Future," Fairplay, June 21, 1984, p. 26.

4/ U.S. Department of Transportation, Maritime Administration, Annual Report on World Shipbuilding, 1983.

5/ "Sweden Plans to Close Uddevalla Yard in 1986," Journal of Commerce, Dec. 13, 1984.

6/ Op. cit., Fairplay, June 21, 1984, p. 26.

7/ "Sweden," Maritime Reporter and Engineering News, July 15, 1984, pp. 24-32, and data obtained from the U.S. Department of Transportation, Maritime Administration.

8/ U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, Hourly Compensation Costs for Production Workers in Ship and Boat Building and Repairing, April 1984.

	Wages (In kronas)	Wages (In dollars)
1979	52.37	12.21
1980	55.89	13.22
1981	62.33	12.38
1982	64.87	10.32

Production of commercial vessels in Swedish shipyards decreased from 39 ships (612,286 grt) in 1979 to 16 ships (292,068 grt) in 1983 as shown in table C-30. In 1983, 56 percent of these ships were for foreign purchasers. In 1983, merchant shipbuilding accounted for an estimated 30 percent of Swedish shipyards' sales revenue, compared with 60 percent in 1980. Table C-30 shows production by type of vessel. Data are not available for ship repair activity in Sweden during 1979-84.

Table C-30.--Commercial ships: Swedish production, 1979-83

Year	Quantity	Weight
	Number	gross registered tons
1979	39	612,286
1980	24	335,663
1981	25	534,523
1982	19	275,462
1983	16	292,068

Source: The Association of West European Shipbuilders, Survey of the Shipbuilding Industry, various issues, 1979-83.

In 1983, Swedish shipbuilders received six orders for new ships totaling 248,500 dwt, the lowest level of orders since 1979 (table C-31). At the end of 1983, Sweden's orderbook was valued at $744.4 million, of which 88 percent was for export. 1/

1/ U.S. Department of Transportation, Maritime Administration.

Table C-31.--Commercial ships: Swedish production, by types, 1983

Item	Quantity	Weight
		gross registered tons
Crude oil tankers	1	73,935
Product carriers	1	16,913
Combined carriers	3	95,298
Ro-ro vessels and car carriers	4	100,415
Small cargo ships	1	2,831
Miscellaneous vessels	6	2,673
Total	16	292,065

Source: Estimated by the staff of the U.S. International Trade Commission on the basis of data from the Association of West European Shipbuilders.

Government involvement

During the period 1973-83, the Swedish Government expended 16 million krona ($3.2 billion) on the shipbuilding and repair industry. Approximately 1.5 billion krona was spent in 1977 when the industry was restructured by the Government through nationalization. Under the Shipbuilding Bill of 1983, 6 billion krona ($800 million) was given to the largest Swedish shipyards for various forms of aid to be utilized through 1986. Part of this assistance is to cover the necessary costs of reducing capacity in the industry. Additionally, Swedish Government guarantees amounting to 800 million krona ($104 million) were allocated during 1980-84 to finance shipbuilders efforts to diversify into production of alternative products. The Government also provides research and development assistance for the industry through the Board for Technical Development. In fiscal year 1982/83 (the latest period for which data are available), 8 million krona ($1.1 million) was expended for maritime research. 1/

Since 1981, Swedish shipbuilders can receive subsidies (conditional write- off loans) for domestic or export projects. The subsidy amount could not exceed 15 percent of the contract price in 1981, 10 percent in 1982, and 5 percent in 1983. During 1984-85, the Swedish Government has allocated 465 million krona ($57.7 million) for these ship-production loans. 2/ However, at the end of 1985, the Swedish Government will end subsidies to the shipbuilding industry. 3/

The Swedish Export Credit Board provides financing for foreign purchasers of commercial vessels built in Swedish shipyards. These loans are provided according to OECD guidelines regarding interest rate and loan terms. Export credit insurance can be obtained from the Swedish Export Credit Insurance

1/ U.S. Department of Transportation, Maritime Administration, Maritime Subsidies, 1983, pp. 140-141, and U.S. Department of Transportation, Maritime Administration, World Government Aid to Shipbuilders and Shipowners, March 1984.

2/ Ibid.

3/ "Less Grease on the Shipways," The Economist, Dec. 22, 1984, p. 75.

Board for commercial and political risks. The premiums for this insurance vary according to the contract value, the purchasing country, and the loan term. 1/

As is the case in most Scandinavian countries, the shipbuilding and repair industries are assisted by the Government in their acquisition of foreign-built materials for commercial vessel construction. Customs duties are waived on components imported into Sweden if they are to be utilized on ships to be exported. Value added taxes are also waived. 2/

Norway

Industry profile

Norway, like other shipbuilding nations, has been affected by the shipbuilding depression. The Norwegian Shipbuilding Association (SBL) describes the industry as having drastically deteriorated over the past few years. Norway's shipyards rarely build large vessels. In 1983 the two biggest ships were 55,000 dwt chemical tankers built at Horten and a 38,400 dwt chemical tanker built by Aker. Those yards with larger capacity, such as Aker, Haugesund mek Verksted, and Bergens mek Verksted are focusing on offshore and repair work. As of July 1984, Moss Rosenberg was the only ship with large vessels on its order books. Ulstein Hatlo, however, has developed a reputation for building more sophisticated vessels. 3/

Most of the repair work on Norway's large fishing fleet and offshore supply vessels is performed by small yards along the coast, which extends above the polar circle. Norway has had difficulty marketing its repair business for larger ships, however, because of location, climate, and high costs. The only yard that has overcome these obstacles is Haugesund mek Verksted, located on the country's west coast. The yards's 150,000 dwt floating dock is attracting foreign shipowners, and the yard has repaired vessels ranging from a diminutive three-masted training ship to large tankers. 4/

From 1975 through 1982, total shipyard employment in Norway declined by 39 percent from 18,700 to 11,400. 5/ In 1983, the shipbuilding work force was reduced by more than 50 percent. Average wages increased by 10 percent from 1982 to 1983. 6/ The following tabulation shows that hourly wages paid to production workers in Norwegian shipyards rose annually during the 4 year period, from 57.26 krona in 1979 to 75.20 krona in 1982 (the latest year for which data are available): 7/

1/ Op. cit., Maritime Subsidies, and World Government Aid to Shipbuilders and Shipowners.

2/ Ibid.

3/ Maritime Reporter/Engineering News, July 15, 1984, pp. 24-32.

4/ Shiprepair, August, 1982, p. 55.

5/ Data supplied by U.S. Department of Transportation, Maritime Administration.

6/ U.S. Department of Labor, Bureau of Labor Statistics, Hourly Compensation Costs for Production Workers in Ship and Boat Building and Repairs, April 1984.

7/ U.S. Department of Defense, Annual report on the Status of the Shipbuilding and Ship Repair Industry of the United States 1983, December 1984. p. 8.

	Wages (In krona)	Wages (In dollars)
1979	57.26	11.31
1980	61.20	12.40
1981	68.22	11.91
1982	75.20	11.65

Although Norway has the world's sixth largest merchant fleet, few replacement vessels are being built in Norwegian yards. In 1983, deliveries totaled $557 million. Of this amount, $239 million was for export. 1/ Industry sources indicate this is due to the fact that Norway's prices are 50 percent higher than those of the Far East. As of late 1983, only one-third of 112 Norwegian shipowners' new ship orders went to domestic yards. Of this number, only five ships of 53,900 dwt or over were ordered. Most of the industry's work is associated with offshore oil activity in the North Sea, which is requiring specialized vessels. Norway is located in the most advantageous geographic position to take advantage of the North Sea offshore industry, but it is doubtful that there will be enough work to support all of Norway's small yards without assistance from the Government. 2/

Production of commercial ships in Norwegian shipyards decreased from 125 ships (382,990 grt) in 1979 to 61 vessels (177,582 grt) in 1983, as shown in the following tabulation:

	Number of ships	Tonnage (in grt)
1979	125	382,990
1980	81	212,158
1981	67	196,438
1982	83	318,321
1983	61	177,582

There were 6 LPG and chemical carriers completed in 1983, 5 small cargo ships, 1 reefer, 1 product carrier, and 48 miscellaneous vessels. 3/

Government involvement

Overall Norwegian Government aid to shipbuilders and ship repairing firms declined by 39 percent between 1981 and 1984; as shown below (in millions of dollars): 4/

1/ Ibid.

2/ Maritime Reporter/Engineering News, July 15, 1984, pp. 24-32.

3/ The Association of West European Shipbuilders, Survey of the Shipbuilding Industry, various years 1979-83.

4/ U.S. Government of Transportation, Maritime Administration, World Government Aid to Shipbuilders and Shipowners, March 1984.

1981----------	$132
1982----------	126
1983----------	97
1984----------	80

The Government grants a 4 percent customs rebate on the sale price of new ships and 3 percent on the cost of repairs. Value-added taxes are waived on all ships including those imported. The investment tax of 13 percent is waived on the price of goods to be used building, repairing, and maintaining commercial ships.

During 1979- May 82, subsidies were paid directly to Norwegian shipyards for shipbuilding contracts with domestic purchasers. The amount of the subsidy was 20 percent of the contract price in 1979, decreasing gradually over time until the program was abolished in 1982. 1/

The Loan Institute for Norwegian Shipyards provides financing to foreign purchasers of commercial vessels in accordance with the OECD guidelines for interest rates and loan terms. However, industry observers indicate that the shipyard's building loans are subsidized by the Government, allowing the yards to offer loans at an average of 8 percent in 1984. Export credit insurance is available from the Government's Guarantee Institute for Export Credit. Industry sources state that favorable loan guarantees are often granted for ship exports to developing countries. 2/

The domestic shipbuilding and repair industries also receive assistance in their research and development efforts. Various institutions in Norway conduct maritime research, receiving financial support from the Government. In 1982 (the latest year for which data are available), through the Committee for Shipping Research, 27 million krona ($3.9 million) was granted to these institutions for shipbuilding research. 3/

Spain

Industry profile

Spain has a large, modern shipbuilding industry within which much of its ship repair capabilities have been integrated. The industry has evolved, with considerable Government support, as a direct result of investment decisions made during the early 1960's. A significant portion of the industry is state owned through the Shipbuilding Division of the Instituto National de Industria (INA). INA is a semi-Government body founded in 1941 to promote and finance the establishment and development of new Spanish industries. In essence, INA is a State Holding responsible for the efficient management of companies in

---

1/ U.S. Department of Transportation, Maritime Administration, Maritime Subsidies, 1983, pp. 107-109, and U.S. Department of Transportation, Maritime Administration, World Government Aid to Shipbuilders and Shipowners, March 1984.

2/ Ibid.

3/ Ibid.

which it holds a share. As shown in table C-32, INA owns outright the principal domestic shipbuilding and repair enterprises that currently account for between 60-70 percent of total Spanish commercial shipbuilding and repair capacity. The privately owned sector of the Spanish industry, while giving up much in terms of scale of operations to its publicly held counterpart, is nonetheless an important and viable segment of the total industry. Many of these small and medium yards are fully competitive with European yards and even with Japanese and Korean builders in some specialized vessels, such as chemical and gas tankers and fishing vessels. 1/

Employment in the Spanish shipbuilding and repair industry totaled 43,000 persons in 1975. By 1981, this figure had fallen to 32,680 employees. The number of workers was estimated at approximately 40,000 in early 1984. However, industry sources indicate that mass layoffs in the industry, affecting as much as 16,000 employees, were scheduled to occur by late 1984. This announcement spurred work strikes and demonstrations in the main industrial ports of Spain's North Atlantic Coast. 2/ Wages paid to production

Table C-32.--Major firms in Spain's shipbuilding and repair industries, by types of ownership and by locations, 1984

Type of ownership, and firm	Location
Government owned:	
Astilleros Espanoles S.A. (AESA)	Puerto Real
	Cadiz
	Sevilla
	Astander
	Bilbao 1/
Astilleros y Talleres del Noroeste S.A. (ASTANO)	El Ferrol
H.J. Barreras	Vigo Bay
Privately owned:	
Union Naval de Lavante	Barcelona
	Valencia
Astilleros Construcciones S.A	Vigo Bay 1/
Freire S.A.	Vigo Bay
Construcciones Navales Santodomingo	Do.
Enrique Lorenzo y Cia S.A	Do.
Astilleros y Varaderos Gumersindo Paz	El Ferrol
Juliana Constructora Gijonesa	Gijon
Astilleros de Atlantico	Santender
Astilleros Cadagua	Bilbao
Tomas Ruiz de Velaasco	Do.

1/ 2 yards.

Source: CONSTRUNAES (Spanish Shipbuilders Trade Association).

1/ Christopher Dawson, "Spanish Maritime Industries, Trying to Keep Capacity Utilized," Marine Engineering/Log, July 1983, pp. 1-4.

2/ "Strikes Hit Spanish Shipbuilding Centres," Financial Times,

workers engaged in the construction and repair of commercial vessels in Spanish shipyards rose annually during 1979-82. Hourly wages totaled 455 pesetas in 1979, compared with 731 pesetas in 1982 (the latest year for which data are available), as shown in the following tabulation: 1/

	Wages in pesetas	Wages in dollars
1979	455	6.78
1980	510	7.12
1981	647	7.03
1982	731	6.64

Industry sources estimate that the Spanish shipbuilding industry had the capacity to produce over 500,000 grt of commercial ships in 1984. However, the industry was operating at 50 percent capacity. The worldwide oversupply of vessels and the slump in world and domestic freight markets were largely responsible.

In general, 1983 was a very disappointing year for Spanish shipbuilding which resulted in across the board financial losses. The Spanish Government also became concerned over the future of the two largest Government-owned yards, AESA and Astano. Future workloads have been deemed insufficient to keep many of the yards operational. As a result, INA has put forth a planned large-scale restructuring of the nation's shipyards. If fully implemented, the plan calls for the closure of two major yards and a total reduction of the labor force. Because of the drastic nature of these reductions, the plan has been met with sharp criticism. 2/

The Spanish Government is also calling for a separate merger process among Spain's 35 small and medium, privately owned shipyards. This program was established in 1983, under the name Sociedad de Reconversion Naval (SORENA), to close yards where necessary, to merge companies, and to analyze and propose improved quality and production methods.

While Spanish yards have in the past been able to build ships that were both technically and economically competitive with the rest of the world, in recent years, the industry has lost it's competitiveness. This has been largely due to problems of excess capacity and to the need to support an excessively large workforce. There has also been a lack of resources to support new investment. Spanish yards, nonetheless, appear to have the essential know-how and are expected to be able to readjust during the 2-3 years following the current reorganization. It appears to be the intention of the Spanish Government to link the current reorganization to the renewal of Spain's merchant fleet. The Ministries of Economy and Transport

---

1/ U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, Hourly Compensation Costs for Production Workers in Ship and Boat Building, April 1984.

2/ Department of Defense, Annual Report on the Status of the Shipbuilding and Ship Repair Industry of the United States 1983, December 1984, p. 8-9.

are also studying future increases in shipbuilding activity, with a view to improved credit facilities and increased foreign trade. 1/

Construction of commercial ships in Spanish shipyards rose from 102 vessels (721,506 grt) in 1979 to 108 vessels (491,981 grt) in 1983 (table C-33). There were 13 bulk carriers built in 1983, 11 general cargo ships, 7 LPG and chemical carriers, 6 full container ships, 6 combined carriers, 4 ro/ro vessels, 2 reefers, and 89 miscellaneous vessels. Approximately 60 percent of the vessels built in Spanish shipyards in 1983 were for export.

Table C-33.--Commercial ships: Spanish production, 1979-83

Year	Quantity	Weight
	Number	gross registered tons
1979	102	721,506
1980	85	507,716
1981	85	533,808
1982	109	472,098
1983	108	491,981

Source: The Association of West European Shipbuilders, Survey of the Shipbuilding Industry, various issues, 1979-84.

Government involvement

As states earlier, the Spanish Government owns a significant portion of the shipbuilding and repair industry. In 1982, the Government extended the shipbuilding industry restructuring effort until 1984. This restructuring began in 1978 and included such benefits to the industry as: postponement of taxes and social security payments; subsidies for closures and diversification of the shipyards; and assistance with labor actions. 2/

The Government of Spain waives import duties on materials imported into the country for use in commercial vessels built for foreign purchases. Additionally, rebates of 5.5 percent are granted on imported components to be used in the construction of domestic ships. Completed commercial vessels imported into Spain, however, are assessed customs duties of 12.4 percent of the value of the ship. If these ships were constructed in the EC, the duty is only 9.3 percent. 3/

The Spanish Government provides shipbuilding construction subsidies of 5.5 percent of the contract price of a commerical vessel for export. Also, a

1/ The Norske Veritas Journal of Business and Technology, July/August 1984, p. 26.

2/ U.S. Department of Transportation. Maritime Administration, Maritime Subsidies, 1983, pp. 135-137, and U.S. Department of Transportation, Maritime Administration, World Government Aid to Shipbuilders and Shipowners, March 1984.

3/ Ibid.

"piggy-back subsidy" of up to 9.5 percent is available to assist in completing export operations necessary to guarantee an adequate workload for domestic shipyards. The 15 percent subsidy is calculated after the customs duty rebate for imported parts has been granted. Industry sources indicate that the Spanish Government is considering raising the total subsidy to 22 percent of the ship's price in order to improve the industry's competitiveness in the world market. 1/

Prior to 1979, the Spanish Government, through the Banco Exterior, offered export financing to foreign purchasers of commercial ships within the OECD guidelines for interest rate and loan terms. In March 1979, Spain announced that it was withdrawing from the OECD understanding on export credit guidelines in order to offer buyers more favorable terms. As of March 1984, foreign ship purchasers could obtain loans at 8.5 percent interest with repayment required in 5.5 years for advanced countries, 5.8 years for intermediate countries, and 8.5 years for developing countries. Foreign ship owners can obtain the above-mentioned financing for 85 percent of the contract price. Export credit insurance is available from the Compania Espanola de Sequros de Credito a la Exportacion SA. This agency is financed by private capital and Spanish Government funds. 2/

Poland

Industry profile

The Polish commercial shipbuilding and repair industries have increasingly benefitted in recent years from work placed in its yards by the Soviet Union. The next Soviet 5-year plan (1986-1990) calls for the acquisition of 500 ships from Polish yards. This compares with expected deliveries of 180 ships during the current 5-year plan (1981-1985) and the 76 ships which were delivered during the previous 5-year plan (1976-1980). If future goals with respect to the Soviet Union are met, only approximately 25 percent of Polands's shipbuilding output will reach purchasers in the West, compared with 50 percent to Soviet Bloc countries and 25 percent to Polish shippers. 3/

These developments would mean that deliveries from Polish shipyards to Western customers would be expected to decline by 25 percent when compared with those in the first half of the decade. Meanwhile, Polish shipping companies, reportedly desperate to replace out-of-date and commercially uncompetitive vessels, would be forced to go out of business, cut back their operations, or turn to Western suppliers of vessels to meet their requirements.

The Polish industry is currently composed of six shipbuilding and six ship repairing concerns. The four largest companies in each line of business are shown in table C-34. All of the firms are state-owned enterprises. The industry is expected to undergo major reconstruction and modernization during

---

1/ Ibid.

2/ Ibid.

3/ U.S. Department of Defense, Coordinator of Shipbuilding, Conversion and Repair, Annual Report on the Status of the Shipbuilding and Ship Repair Industry of the United States 1983, p. 8-8.

1986-1990. This new maritime program also calls for a vigorous anti-pollution drive for the Baltic region of Poland.

Table C-34.--Major firms in Poland's shipbuilding and ship repairing industries, by locations, 1984

Item	Location
Shipbuilding:	
Stocznia im. Lenina	Gdansk
Stocznia im. Komuny Paryskiej	Gdynia
Stocznia im. Warskiego	Szczecin
Stocznia Polnocna	Gdansk
Ship repairing:	
Gdanska Stocznia Remontowa	Gdansk
Nauta	Gdynia
Gryfia	Szezecin
Odra	Swinoujscie

Source: Official statistics provided by the Polish Government through its Embassy in Washington, DC.

Employment in the Polish construction and repair industries declined only slightly during 1979-81 from 59,500 workers to 59,200 workers. Declines in recent years have been more pronounced, however, with reductions decreasing the workforce by 9 percent to 54,100 workers in 1982 and then by 3 percent to 52,600 workers in 1983. Data are not available for employment in Polish shipyards in 1984.

The level of commercial shipbuilding and repair operations in Polish shipyards declined during 1979-83 (table C-35). Commercial shipbuilding fell from 484,200 grt in 1979 to 416,000 in 1983, or by 14 percent. The number of ships repaired in 1979 totaled 768 (2.5 million grt). Repair activity decreased annually through 1982, when it totaled 588 vessels (2.0 million grt). In 1983 the Polish ship-repair industry repaired 599 commercial ships.

Table C-35.--Commercial ships: Polish production and repair activities, 1979-83

Year	Shipbuilding	Ship repair	
	Weight	Quantity	Weight
	1,000 gross registered tons	Units	1,000 gross registered tons
1979	484.2	768	2,529.6
1980	384.6	738	2,446.2
1981	361.1	591	1,933.7
1982	413.6	588	1,970.4
1983	416.0	599	1,763.8

Source: Official statistics provided by the Polish Government through its Embassy in Washington, DC.

Yugoslavia

Industry profile

Though heavily dependent upon export orders, and particularly upon sales that net it hard exchange currency, the Yugoslavian shipbuilding industry has managed to retain a relatively high level of capacity utilization. Five shipyards together account for 95 percent of total industry capacity. Three of these yards--Uljanik in Pula, Third of May in Rijeka, and Split in Split--are by far the largest. Yugoslavian yards ranked ninth in the world with 797,000 d.w.t. of shipping on order in 1984. Yugoslavian yards delivered just over 210,000 grt in 1983, slightly less than the 252,000 grt delivered in 1982. The industry reportedly employed approximately 23,000 workers in 1983, up from approximately 20,000 in 1980, although many of these employees may not have been actively engaged in shipbuilding activities. Net wages in the industry average approximately 32,000 dinars, or $170 a month. 1/

In recent years, Yugoslav yards have sold more than 90 percent of their total output abroad. Although some of these sales have been to Western nations, major purchasers have been the Third World (Liberia, India, Iraq, Nigeria), the Peoples Republic of China, and particularly the Soviet Union. Soviet purchases have reportedly been made in an attempt to balance sales to Yugoslavia of Soviet oil and gas. 2/

Yugoslav shipbuilders are reportedly particularly competitive in export markets for a number of reasons. Yugoslav shipbuilders receive a 20-30 percent tax rebate on export sales. The value of the local currency, the dinar, has been declining in value in recent years against the dollar and

1/ "Yugoslav Shipyards Rank Among World's Top Ten in Total Orders," Journal of Commerce, December 18, 1984, p. 64.

2/ Ibid.

other convertible currencies. Also, Yugoslav shipbuilders reportedly have a competitive cost advantage in the production of specialized vessels. Many Yugoslav yards, in fact, have concentrated on the production of specialized ships, such as product and chemical carriers, offshore installations and floating industrial plants, and offshore drilling rigs and platforms. 1/

The Yugoslav industry continues to be plagued, in spite of it's successes, by a severe shortage of hard currency. In order to maintain its competitiveness by offering state-of-the-art technology, industry sources indicate that Yugoslav shipyards import as much as 30 percent of the average value of its ships from foreign sources. Major purchases include steel, electronics, radars, cranes, and propellers. Even though the Yugoslavian shipbuilding industry has maintained an overall favorable balance of trade, government-imposed exchange laws have limited the amount of earned exchange that shipyards can retain to only 50-60 percent. This has left many yards without foreign exchange with which to make critical import purchases. One such development required Yugoslavia's largest yard to order an involuntary "vacation" in early 1983 because key raw materials were not available to maintain full production. Other industry difficulties have arisen as the result of payment difficulties experienced by foreign purchasers, which have led to special payment rescheduling and moratoria. In addition, dependence on the Eastern "clearing" market, particularly with the Soviet Union, has provided Yugoslav yards with substantial dinar profits but little in the way of hard foreign currency.

In order to overcome these difficulties, Yugoslav yards have been entering fields of production aimed at increasing foreign exchange inflows while reducing outflows. The production of offshore structures is one such area, the production of which has been jointly undertaken by several yards. Collaboration among Yugoslav yards is likely to continue as the industry's technological level increases and more sophisticated work is sought. In addition, industry observers note that Yugoslavian yards have increased the scrapping of old ships for raw materials in order to reduce their outlays of hard currency reserves.

Yugoslav yards are hoping that their competitive cost advantage may eventually attract Western technology to take advantage of export opportunities to Third World markets. Yugoslavia's maintenance of friendly relations with numerous countries with which they do business may continue to offset the disadvantage of having a relatively small home market to service.

Union of Soviet Socialist Republics

Country profile

As of 1983, the Union of Soviet Socialist Republics (U.S.S.R.) had accumulated a merchant marine fleet comprised of 1,740 ships of 20.5 million dwt, much of it of Soviet manufacture. 2/ Over the years, however, the Soviet

---

1/ Op. cit., Journal of Commerce, p. 64.

2/ Coordinator of Shipbuilding, Conversion and Repair, U.S. Department of Defense, Annual Report of the Status of the Shipbuilding and Ship Repair Industry of the United States 1983, p. 8-15.

Union has made increasingly significant purchases of commercial vessels from other socialist countries, including the German Democratic Republic, Poland, and Yugoslavia. The current Soviet five year plan (1981-86), calls for the expansion of dry cargo multipurpose vessel tonnage by only 10 to 15 percent. In individual vessel sectors, however, increases will be more pronounced.

While much more is currently known about the more visible Soviet naval shipbuilding complex, its commercial counterpart appears to be principally vested in five shipbuilding and repair facilities. These are: the A. A. Zhdonov Shipyard in Leningrad, the Moscow Shipbuilding and Ship Repair Yard, the Kherson Shipbuilding Amalgamation in Kherson, the Poti Ship Repair and Shipbuilding Yard in Poti, and the Vyubord Shipyard of Vyborg. These yards receive significant support from Soviet steel producers and from major-components producers such as diesel producers Dvigatel Revaliutsii Works in Gorky and Russky Dizel in Leningrad.

Ship design in Soviet yards has, in many cases, become a highly centralized activity of the Soviet Ministry of Shipbuilding. The long tenure of key people in Soviet design bureaus has insured the continuity and commonality of Soviet shipbuilding design. The emphasis of Soviet policy in this area of shipbuilding has been on proven concepts and components while maintaining a degree of flexibility in improving the performance of each line of ship over the life of its associated construction program--usually 10 years. While Soviet shipyards have stressed standardization in ship design; simplicity, and ruggedness have also been key tenants of Soviet-built vessels. While prospective customers are reportedly attracted to the high degree of automation, modern navigational aids, and excellent seaworthiness of Soviet vessels, the chief merits of Soviet-built ships have been said to be their reliability and profitability. 1/

During 1981-85, the principal concentration in the Soviet shipbuilding industry will be related to the production of vessels and structures to improve the country's transportation system, increase food production, and improve oil and gas extraction capabilities on the country's continental shelf. The vessels include nuclear-powered ice breakers, passenger hydrofoils, self-lifting drilling platforms, semisubmersible articized drilling rigs, and drilling ships. In order to build increasingly sophisticated modern vessels, the Soviet shipbuilding industry is expected to become involved in closer cooperative efforts with shipbuilders and standard equipment suppliers in other countries. The Soviet Union and Finland are already involved in extensive collaborative efforts that involve the exchange of technology and the production in Finland of vessels in which Soviet main engines, steam boilers, radio navigation, electrical, and other equipment are extensively incorporated. Much of the latter work is done for Soviet customers. 2/

1/ "Reliability and Profitability: The Chief Merits of Soviet Ships," Soviet Export, Vol. 1/148, p. 15.

2/ "U.S.S.R - Finland: Deepening Co-operation in Shipbuilding," Soviet Export, Vol. 6/141, p. 54, 57.

In 1983, the Soviet commercial shipbuilding industry produced 12 merchant/trading vessels of approximately 229,000 dwt. This compares with the production of 10 vessels each in 1981 and 1982 and 18 vessels in 1980, the comparable tonnage of which is not available. 1/

It is estimated that approximately one-third of the output of Soviet yards during 1980-83 was exported. The majority of these exports were to Cuba, Algeria, Sweden, Norway, and West Germany. The Soviet trade association V/O SUDOIMPORT of Moscow, conducts most of the export activities for Soviet shipbuilders. Originally established by the Soviet Government to regulate import trade exclusively, SUDOIMPORT has been responsible for the exportation of 2.5 million dwt in large tonnage Soviet ships since 1960. SUDOIMPORT not only conducts mutually profitable trade for the Soviet Union, but also promotes scientific and technical links among socialist nations designed to increase the economic integration of the socialist countries in the CMEA. SUDOIMPORT has been responsible for the signing of numerous multilateral agreements during 1981-85 between Soviet yards and CMEA-member-country yards relating to the coproduction of ships, shipboard machinery, and radio equipment, to name a few. 2/

Brazil

Industry profile

The Brazilian shipbuilding industry has evolved, since 1941, into the largest among Latin American countries, in large part because of Brazil's preoccupation with foreign trade and because of a concerted attempt to reduce the country's dependence on expensive, chartered, foreign-flag shipping. In 1941, the Government of Brazil (GOB) established, under the Ministry of Transport, the Superintendência Nacional da Marinha Mercante (SUNAMAM), or the National Superintendency for the Merchant Marine. SUNAMAM was established to implement the GOB's policies with respect to the Merchant Marine and to supervise shipbuilding and repair activities aimed at a growth in the size of Brazil's merchant fleet. 3/

Until recently, SUNAMAM was responsible for planning and carrying out ship construction programs; supervising and controlling the execution of ship construction contracts; arranging for the replacement of foreign-manufactured ship components with local products; regulating, administering, and supervising shipbuilding financing activities for construction and acquisition of vessels; and authorizing the repairing of Government-owned vessels in foreign shipyards. The establishment of the Merchant Marine Fund in 1958 permitted SUNAMAM in effect to become a bank for advancing and promoting the

---

1/ U.S. Department of Defense, Coordinator of Shipbuilding, Conversion, and Repair, Annual Report on the Status of the Shipbuilding and Ship Repair Industry of the United States 1983, December 1984, tables 8-3 and 8-4.

2/ "SUDOIMPORT: 30 Year on the World Market," Soviet Export, Vol. 1/148, p. 3.

3/ "Brazilian Shipbuilding: An Industry on the Go," Brazil Trade and Industry (Special Section), June 1982, p. 1.

Brazilian shipbuilding industry. This funding was largely responsible for the rise in size of the Brazilian merchant fleet from just over 1 million dwt in 1958 to 9.5 million dwt in 1982. With the rapid expansion of the domestic merchant fleet, approximately 80 percent of which was delivered from Brazilian shipyards, there was a commensurate rise in the number of shipbuilding and repair facilities to a high of 38 in 1977. However, in recent years, the global economic recession and declining competitiveness of Brazilian vessels has resulted in a shortage of cargoes and a surplus of vessels. This in turn has resulted in a reduction in the number of major Brazilian shipbuilding and repair yards to 12-- 9 devoted to shipbuilding and 3 to repair. 1/ A listing of the names and locations of these yards is provided in table C-36. The companies in the table are listed according to the approximate size of their operations in either shipbuilding or ship repair in 1984, with the largest operations appearing first.

Table C-36.--Major shipyards in Brazil's shipbuilding and ship-repair industries, by locations, 1984

Item	Location
Shipbuilding:	
Ishikawajuma do Brasil Estaleiros S.A. (Ishibras)	Rio de Janeiro.
Estaleiros Reunidos do Brasil S.A. (Verolme)	Angra dos Reis.
Companhia Comercioe Navegacao (CCN)	Rio de Janeiro.
Industrias Reunidas Caneco S.A. (Caneco)	Do.
Engenharia e Maquinas S.A. (Emaq)	Do.
Empresa Brasileira de Construcao Naval S.A. (Ebrasa)	Santa Catarina.
Corena-Metalurgia e Construcoes Navais S.A. (Corena)	Itajai.
Estaleiro So S.A.	Pôrto Alegre.
Estaleiro Amazônia S.A. (Estanave)	Amazonas.
Ship repair:	
Empresa Brasileira de Reparos Navais S.A. (Renave)	Santa Catarina.
Empresa Naval de Equipamentos, Comercio e Industria Ltda. (Enave)	Rio de Janeiro.
Arsenal de Marinha do Rio de Janeiro (AMRJ)	Do.

Source: ESABRAS (Associated Shipyards of Brasil).

1/ U.S. Department of State Telegram, Nov. 17, 1983, pp. 1-3.

In 1984, the top five shipbuilding firms accounted for approximately 89 percent of the annual steel-processing capacity of the Brazilian shipbuilding industry. All of the Brazilian yards are privately owned; however, the Brazilian Government through state-owned ship lines, Lloyd Brasileiro and Docenave, holds 49 percent of the stock of the ship-repair enterprise of the Renave.

Employment in Brazilian shipyards increased from 15,000 workers in 1977 to slightly over 50,000 workers in 1979 and 1980. At present, the total stands at just 25,000 workers. However, industry sources indicate that major reductions in employment may occur within the next 2 years.

The level of technology employed in Brazil's two leading yards, Ishibras and Verolme, is generally on a par with that employed elsewhere in the world. Ishibras employs the latest technology, which is supplied to it by its Japanese parent, Ishikawajima Heavy Industries. Verolme has benefitted from technology transfers from its Dutch parent Rijn-Schelde Verolme. The future ownership and organization of Verolme-Brazil, however, is somewhat in question as a result of the Dutch parent's own financial difficulties. The remainder of the Brazilian shipbuilding industry is not considered to be on a technical par with its principal international competitors.

In addition, the Brazilian shipbuilding industry is currently not price competitive with foreign shipbuilders without GOB subsidies. This is due principally to the 15-20 percent foreign content of vessels produced for domestic consumption and the 25-30 percent foreign content of vessels for export.

From 1964-82, the Brazilian shipbuilding industry delivered 53 ships and 113 smaller vessels to foreign purchasers, totaling 1.3 million d.w.t. and valued at $645.3 million. In 1983, the Brazilian industry had 13 ships and 4 offshore drilling platforms valued at $418.1 million under construction for foreign purchasers. New orders for export sales have virtually ceased to be placed and it remains to be seen what effect the 30 percent devaluation of the cruzeiro in February 1983 will have on new orders.

At the beginning of 1983, deliveries from Brazilian shipyards were estimated to total 787,000 d.w.t. for the full year. This was down slightly from the 853,000 d.w.t. delivered during 1982 but significantly less than 1981 deliveries, which totaled approximately 1,191,000 d.w.t. The historical industry peak was reached in 1979 when Brazilian shipyards delivered 1,458,000 dwt. 1/

Future prospects for Brazilian shipbuilders depend heavily on the situation in international markets, with the future of a few Brazilian yards in question. SUNAMAM has effectively run out of funds with which to subsidize new construction. With dwindling order backlogs, Brazilian shipyards idled 30 percent of capacity in 1983. If new orders are not quickly forthcoming, shipyards face massive lay-offs and eventual shutdowns. The GOB has had to curtail many ship and offshore equipment orders as part of investment austerities ordered by the International Monetary Fund. These actions were prompted by Brazil's difficulties in meeting the payments on its 1983 debt of $86 billion. 2/

1/ Ibid, p. 6.

2/ James Bruce, "Latin American Shipping, A Seatrade Guide (1983)," Feirase Conferencias Interacionais Ltda., 1984, p. 51.

Government involvement

Subsidies/financing policies.--Because Brazilian-made ships usually cost 30-60 percent more than ships made in the Far East and Europe, the Government has heavily subsidized shipbuilding. In the 1970's the subsidies were primarily structured to promote import substitution and ship purchasing by Brazilians. When domestic orders fell in the early 1980's, during the economic recession, subsidies became more oriented to promote ship purchasing by foreign shipowners.

The subsidy plan existing before 1980 had three main elements. One element covered the difference between the cost of building a ship in Brazil and the comparable international price. SUNAMAM paid this difference--called the premium--directly to shipbuilders as a grant so that Brazilian-made ships were never priced over their international competition, regardless of how great the difference might have been. The funds for the grant came from the Merchant Marine Fund administered by SUNAMAM from 1959 to 1983. Funds for the Merchant Marine Fund came from the Government budget and also from a tax called the Additional Payment on Freight for the Renewal of the Merchant Marine, AFRMM, charged on import, coastwise and local freights.

The second element of the subsidy concerned the portion that purchasers of Brazilian-made ships were left to pay, i.e. the international price. The purchasers had to pay 15 percent of the international price during construction with the rest financed over 15 years, with a grace period of up to 6 months after the ship was delivered. The maximum interest rate for the 15-year financing was 8 percent after adjusting for inflation.

The third element of the subsidy concerned the discriminatory application of the AFRMM tax. When freight was carried by a foreign ship, the whole AFRMM was charged the shipowner and the funds were channeled to the Merchant Marine Fund. However, when the freight was carried by a Brazilian-made ship, only 65 percent of the AFRMM went to the Merchant Marine Fund while the rest was returned to the Brazilian shipowner as a subsidy for renewing, expanding, and repairing the fleet. One exception that allowed a foreign-made ship to receive the AFRMM rebate was when a foreign ship was chartered by a Brazilian shipowner to fill the place of a ship being constructed in Brazilian shipyards.

With Decree-Law 1801 of August 18, 1980, the various subsidy elements mentioned above were reduced or eliminated. The grant for covering the premium was partially withdrawn and replaced by the AFRMM subsidy. That is, once a ship-construction contract had been signed, SUNAMAM would begin to withhold as many installments of the AFRMM (generated by chartered ships and by the ship itself once delivered) as necessary to cover the cost of the premium. However, if the amount of the AFRMM withheld was less than the premium, SUNAMAM agreed to make up the difference with a grant.

Another change concerned the long-term financing of the international cost of the ship once delivered. Unlike the previous arrangement, where 15 percent of the international cost had to be paid during construction, under the new plan, 10 percent of the domestic cost of the ship had to be paid. The remainder could be financed under conditions established by the National Monetary Council.

Under another alteration from the previous subsidy policy, the AFRMM subsidy generated by a chartered ship could only be paid for 3 years. The ability of a shipowner to use funds obtained from AFRMM to amortize financing after paying the premium was allowed to continue. However, the rate of the AFRMM tax was raised and the amount rebated reduced.

Since early 1983, the Merchant Marine Fund has been transferred from SUNAMAM to the National Economic and Social Development Bank, (BNDES). BNDES is supposed to provide financing to domestic shipowners only. The conditions of this financing include 12 years maturity and 4 years of grace. Interest rates vary from 6 per cent to 3 percent above the inflation rate. 1/

Foreign purchasers of Brazilian ships are now able to take advantage of an interest equalization plan. Under this plan, rates of foreign commercial bank loans for ship financing are subsidized at or below the level of subsidized European and Japanese rates. The terms for the financing are 90 percent credit for 10 years at a fixed 7.5 percent. 2/ Under this funding arrangement, the Banco do Brasil's foreign trade office announced in 1984 that another $500 million will be available for ship export financing under the plan. 3/

The Credito Premio is an export subsidy that provides exporters with a cash grant equal to a share of the value of their exports. In December, 1974, for example, the Credito Premio was 7 percent. Hence a shipbuilder delivering a $1 million ship to a foreign shipper would receive the Cruzeiro equivalent of $70,000 from the Brazilian Government for the export.

The subsidy was first introduced in 1968 but was abolished following the large devaluation of December 1979. Abolishing the subsidy in 1979 was consistent with Brazil's obligations as a signatory to the GATT Agreement on Subsidies and Countervailing Duties. However, the Credito Premio was reintroduced in April 1981 with a plan to phase out the program by 1983. 4/ This plan was subsequently altered, and the credito premio was scheduled to be phased out in 1985.

Before the 1979 devaluation, the level of the credito premio was based on the tax level of the IPI value-added tax. The level of the IPI tax varies, depending upon the product under consideration. Therefore, some exports received greater tax grants than others. When it was reinstituted in 1981, the new Credito Premio was set at a flat 15 percent for all products. The level has been gradually decreased since then and will continue to drop, according to the Government's plan, until May 1, 1985, when it will be phased out entirely.

1/ "Brazilian Report," Seatrade, May 1984, pp. 145-155.

2/ "Brazilian Finance," NSN Bulletin, Aug. 31, 1984, p. 5.

3/ Instituto de Estudios de la Marina Mercante Iberoamericana, Latin American Shipping, 1984, p. 53.

4/ In 1981, when the Credito Premio was reintroduced until 1983, the United States still considered Brazil "a country under the agreement" (i.e., the Agreement on Subsidies and Countervailing Duties), because the new timetable was roughly consistent with the original timetable agreed to during the MTN. However, extending the life of the Credito Premio until 1985 required further negotiations with the United States.

Tax policies.--The Brazilian Government uses tax policy to encourage certain types of economic activity as well as to raise revenue. For example, the Brazilian policy of exempting taxes on export sales encourages exports of ships. Furthermore, the Government exempts certain value-added taxes on imported parts going into ships. Also the government rebates part of a tax on shipping cargoes to help stimulate the domestic shipping industry.

Export incentives.--The profit on approved export sales is exempt from income tax. In addition, related expenses incurred abroad for promotion, advertising, participation in trade fairs and expositions, as well as for maintaining foreign offices, are deductible. Approved products are manufactured goods chosen by the Ministry of Finance and intended for penetration into the international market.

Value-added taxes.--Import components for vessels under construction are exempt from two value-added taxes described below. This exemption usually applies to imported components on exports, but in the case of shipbuilding the exemption applies even for ships used in domestic commerce.

The Industrial Product Tax (IPT) rebate is levied by the Federal Government on national and foreign goods. The amount charged for each product varies considerably from zero percent, for essential products, to over 366 percent for cigarettes. When manufacturers can present an export voucher from the Bank of Brazil, they receive a tax credit for the IPT paid.

The tax on the circulation of goods (ICM) rebate is a value-added tax levied by the States. Unlike the IPT, the ICM is levied at a flat rate. Exemption from the ICM tax is usually granted only for exports of manufactured goods. Exports of agricultural produce and other nonmanufactured items are taxed.

The AFRMM is a tax imposed on freights imported in international trade and on coastal freight. The tax is partially rebated when the cargo ship is Brazilian made. The tax is also rebated on foreign-made ships if they are chartered by a Brazilian shipowner who has placed an order for a ship in a Brazilian shipyard.

Impact of Government involvement.--Using Government financing to stimulate shipbuilding, Brazil went from an insignificant shipbuilder in 1958 to the world's second largest shipbuilder, after Japan, in 1980. Whereas in 1964 Brazilian shipyards delivered only 31 thousand deadweight tons, by 1980 Brazilian shipyards delivered over 1 million deadweight tons. Although sales from Brazilian shipyards have fallen since 1980, Brazil, with 12 shipbuilders, still has the capacity of a major shipbuilder.

Canada

Industry profile

In the late 1940's, Canada was the second largest manufacturer of ships; the United States was the largest. During the postwar period, the Canadian shipbuilding industry was kept active mainly by an increase in demand for

maximum seaways-size bulkers and self loaders for the St. Lawrence Seaway and by the renewal of the naval fleet. 1/ Canada currently has approximately 25 major shipyards that perform construction and repair of commercial vessels. 2/ A listing of Canadian shipbuilding facilities is shown in table C-37 and figure C-3 illustrates the geographic location of these shipyards. As of January 1, 1984, there were nine Canadian shipyards with vessels over 1,000 gross tons on order or under construction in Canadian yards. 3/

Table C-37.--Canada's shipbuilding and repair industries: Major shipyards and their locations, 1984

Name	Location
Allied Shipbuilders, Ltd	North Vancouver, BC.
Bel-Air Shipyard, Ltd	North Vancouver, BC.
Breton Industries and Marine, Ltd	Port Hawpestry, NS.
Burrand Yarrows Corp	Vancouver, BC.
Collingwood Shipyards	Collingwood, On.
Davis Shipbuilding, Ltd	Laugon, PQ.
Georgetown Shipyard, Inc	Georgetown, PE.
Halifax Industries, Ltd	Halifax, NS.
Herb Fraser & Assoc., Ltd	Port Colborne
Marine Industrie, Ltd	Sorel, PQ.
Marystown Shipyard, Ltd	Marystown, NF.
Montreal Tankers Repairs, Inc	Montreal, PQ.
Newfoundland Dockyard, Inc	St. John's, NF, PQ.
Northern Arc Shipbuilders, Ltd	Hay River, NT.
Pictou Industries, Ltd	Pictor, NS.
Port Arthur Shipbuilding, Co	Thunder Bay, ON.
Port Weller Dry Docks	St. Catherine, ON.
Purvis Navon Shipyard, Ltd	St. Catherine, ON.
Rivtow Industries, Ltd	Vancouver, BC.
Saint John Shipbuilding & Dry Dock, Co, Ltd	Saint John, NB.
Vancouver Shipyards Co., Ltd	North Vancouver, B.C.
Vesscault Navigation, Inc	Les Mickis, PQ.
Versatile, Vickers, Inc	Montreal, PQ.

Source: Canadian Shipbuilding & Ship Repair Association.

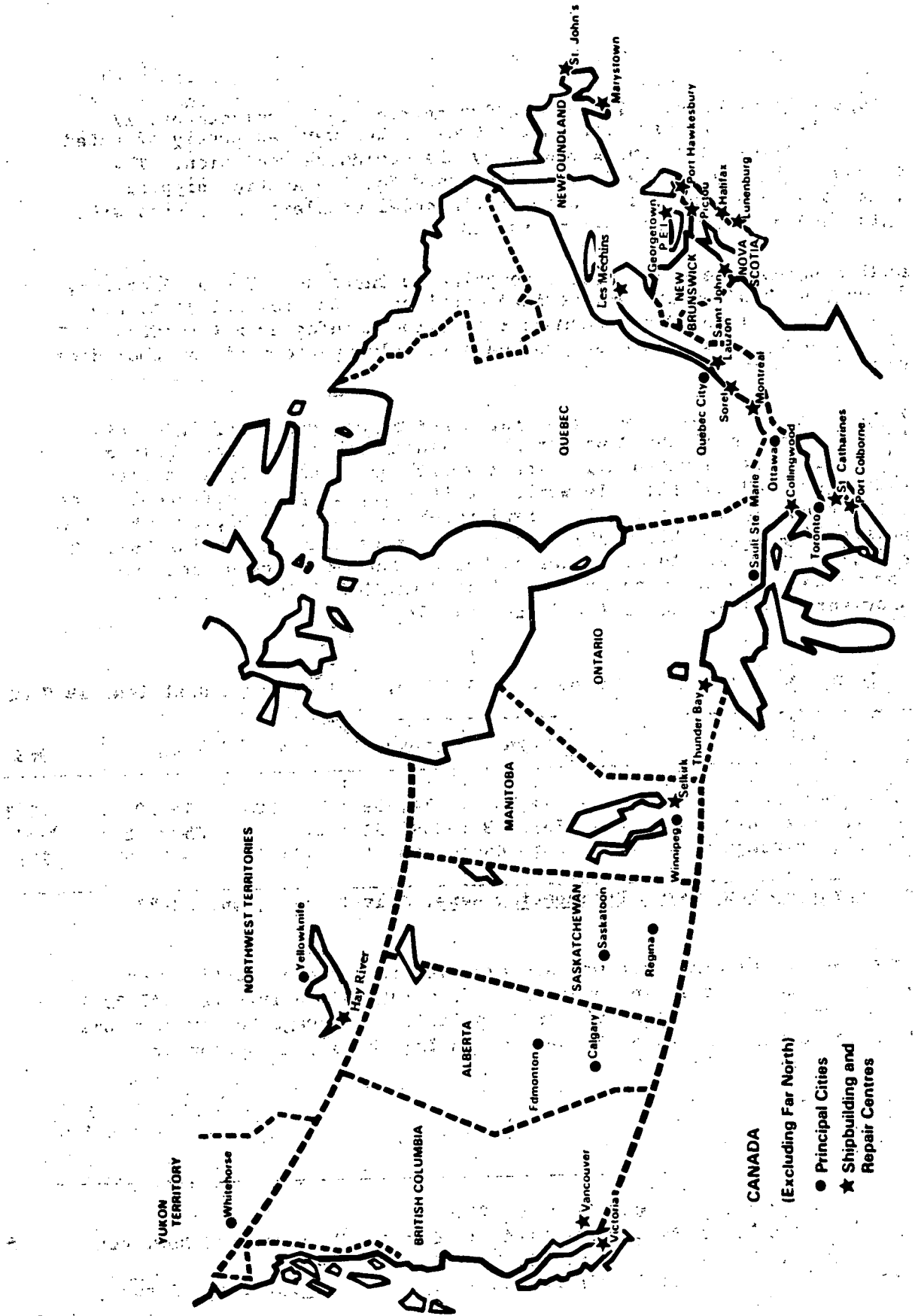
Planned shipyard expansion met with mixed results during the past 2-3 years. In 1982, one of the major yards completed a Syncraft ship elevator and transfer facility. This, combined with its existing graveling dock will allow

1/ Henry M. Walsh, "Canadian Shipbuilding and Offshore and Arctic Prospects," Maritime Reporter/Engineering News, June 1, 1983, p. 56.

2/ Lynden Watkins, "Canada: Repair Reliance Pays Off," Shiprepair, August 1984, p. 27.

3/ "Canadian Shipbuilding," Maritime Reporter/Engineering News, February 1984, p. 58.

Figure C-3.--Major Canadian shipbuilders and ship repairers.



Source: Canadian Shipbuilders Association.

the yard to handle up to 90 million or 4,000 metric tons displacement. 1/ Plans for a large, new repair dock on the Great Lakes were adversely affected by the recent decline in shipping caused by the worldwide recession. The proposed construction of a new $350 million yard for the Arctic Shipping industry has also been delayed because of financial problems associated with the oil glut and a decline in new orders. 2/

Canadian shipbuilders are also attempting to increase their productivity and efficiency with advanced computerized machinery. Several shipyards have ordered Computer Assisted Design/Computer Assisted Manufacturer (CAD/CAM) systems from Norwegian and Swedish producers to help update their shipbuilding techniques. 3/

Internationally competitive labor rates and a good record of industrial stability are features of the Canadian Shipbuilding force that have helped make its vessels more marketable in recent years. 4/ These shipyards also have a highly skilled and flexible workforce that can adapt to different types of ships for construction or repair. Employment in Canadian shipyards totaled 14,187 persons in 1979 (table C-38). This level rose annually during 1979-82, reaching 15,205 workers. In 1983, the number of Canadian workers fell to 11,300, or by 26 percent. Data for the first 9 months of 1984 indicated that employment had declined to 7,267 persons. 5/

Table C-38.--Employment in Canada's shipbuilding and repair industries, 1979-83

Item	1979	1980	1981	1982	1983
Number of workers	14,187	14,599	15,305	15,205	11,300
Average weekly earnings	$366.98	$396.51	$456.77	$512.78	$547.25
Average hourly earnings	$9.06	$9.84	$11.16	$12.68	$13.69

Source: Maritime Reporter & Engineering News, July 1, 1984, pp. 82-84.

Average weekly earnings for workers employed in the construction and repair of commercial vessels in Canada rose from $366.98 in 1979 to $547.25 in 1983 (the latest year for which data are available). Average hourly earnings for production workers increased 51 percent during the 5-year period, from $9.06 in 1979 to $13.69 in 1983.

1/ "Ibid. p. 59.
2/ Op. cit., Shiprepair, August 1984, p. 29.
3/ "Scandinavian CAD/CAM System for Yards in Canada, Finland, and Northern Ireland," Fairplay, Feb. 23, 1984, p. 19.
4/ Lynden Watkins, "Canada: Repair Reliance Pays Off," Shiprepair, August, 1984, p. 29.
5/ "Value Declines at Shipyards in Canada," Journal of Commerce, Nov. 20, 1984, p. 24B.

The Canadian shipbuilding industry has been in a state of decline for the past 8-10 years. 1/ The recent world economic recession and resulting over-capacity, along with strong international shipbuilding competition depressed prices during 1982-83 and contributed to the Canadian shipbuilding industry's current crisis. 2/ Unlike some of the other Western countries, Canada has not been forced to close any of its major shipyards. 3/ However, without Government contracts, many of the major yards would be without work.

The value of construction and repair of Government and commercial vessels in Canadian shipyards rose annually during 1979-82, from $579.2 million to $949.2 million (table C-39). In 1983, this figure fell 38 percent, to $586.0 million. Construction of commercial ships followed a similar trend, rising from $386.6 million in 1979 to $624.3 million in 1982, before falling to $328.9 million in 1983. New construction in the first three quarters of 1984 was valued at $360 million (the latest period for which data are available). 4/

Table C-39.--Construction and repair of Canada's commercial ships and Government vessels, 1979-83

(In thousands of dollars)

Item	1979	1980	1981	1982	1983
Construction of commercial ships	386,625	447,551	432,550	642,298	328,906
Construction of Canadian Government ships	11,585	29,100	49,232	28,620	32,837
Total construction	398,210	476,651	481,782	652,918	381,743
Repairs and conversion of commercial ships	134,437	158,544	243,899	214,883	145,789
Repairs and conversion of Canadian Government ships	46,541	48,564	69,801	81,345	58,433
Total repair	180,978	207,108	313,700	296,228	204,222
Grand total	579,188	683,759	795,482	949,146	585,965

Source: Canadian Shipbuilding & Ship-Repair Association.

Repair work continues to provide the backbone for Canada's shipyards. In recent years, it accounted for nearly half of the industry's employment and productivity. 5/ Repair work and conversions of commercial ships in Canadian

1/ "Canadian Shipbuilding," Marine Engineering/Log, February, 1984, p. 57.
2/ Henry M. Walsh, "Canadian Shipbuilding and Offshore and Artic Prospects," Maritime Reporter/Engineering News, June 1, 1983, p. 53.
3/ "Government Anomalies Infuriate Builders," Fairplay, Mar. 15, 1984, p. 32.
4/ "Value Declines at Shipyards in Canada," Journal of Commerce, November 20, 1984, p. 24B.
5/ Lynden Watkins, "Canada: Repair Reliance Pays Off," Shiprepair, August, 1984, p. 27.

shipyards rose from $134.4 million in 1979 to $243.9 million in 1981. The value of this work then decreased annually over the next 2 years, falling to $145.8 million in 1983. Repair and conversion of Canadian Government ships increased to $81.3 million in 1982, before declining to $58.4 million in 1983.

Imports of commercial vessels into Canada rose irregularly during 1980-83, reaching $778.1 million as shown in the following tabulation (in thousands of dollars): 1/

Year	Imports
1980	312,143
1981	526,789
1982	281,824
1983	778,144

Foreign imports totaled 38 vessels, or 198,743 gross tons in 1983, including 5 offshore drilling rigs and 16 supply vessels. No fishing vessels were imported. Record temporary entries of vessels occurred in 1982 and 1983 because of the low, temporary entry duty implemented by the Canadian Government. In the first 9 months of 1983, 94 vessels were imported on a temporary basis under this provision. 2/

The value of Canadian exports of commercial vessels declined by 50 percent during 1980-83, as shown in the following tabulation: 3/

Year	Value of Exports
1980	360,437
1981	210,931
1982	310,431
1983	179,799

In 1983, only three ships for export were delivered (2 jack-up drilling rigs and one deck freighter, totaling 11,200 gross tons).

Government Involvement

Several aspects of the Canadian Government's shipping policy affect the Canadian shipbuilding industry. One Government goal is to ensure the availability of adequate and economic shipping services for Canadian trade. Secondly, the Government encourages the shipping industry to take advantage of opportunities such as the export of Arctic resources and requires that Canadian flag vessels be used as much as possible in doing so as long as costs

---

1/ Henry M. Walsh, "Canadian Shipbuilding-1984," Maritime Reporter/Engineering News, Vol. 46, no. 11, July 11, 1984, p. 84. Data for 1984 are not available.

2/ "Government Anomalies Infuriate Builders," Fairplay, Mar. 15, 1984, p. 33.

3/ Op. cit., "Canadian Shipbuilding-1984," p. 84.

The Canadian shipbuilding industry has been in a state of decline for the past 8-10 years. 1/ The recent world economic recession and resulting over-capacity, along with strong international shipbuilding competition depressed prices during 1982-83 and contributed to the Canadian shipbuilding industry's current crisis. 2/ Unlike some of the other Western countries, Canada has not been forced to close any of its major shipyards. 3/ However, without Government contracts, many of the major yards would be without work.

The value of construction and repair of Government and commercial vessels in Canadian shipyards rose annually during 1979-82, from $579.2 million to $949.2 million (table C-39). In 1983, this figure fell 38 percent, to $586.0 million. Construction of commercial ships followed a similar trend, rising from $386.6 million in 1979 to $624.3 million in 1982, before falling to $328.9 million in 1983. New construction in the first three quarters of 1984 was valued at $360 million (the latest period for which data are available). 4/

Table C-39.--Construction and repair of Canada's commercial ships and Government vessels, 1979-83

(In thousands of dollars)

Item	1979	1980	1981	1982	1983
Construction of commercial ships	386,625	447,551	432,550	642,298	328,906
Construction of Canadian Government ships	11,585	29,100	49,232	28,620	32,837
Total construction	398,210	476,651	481,782	652,918	381,743
Repairs and conversion of commercial ships	134,437	158,544	243,899	214,883	145,789
Repairs and conversion of Canadian Government ships	46,541	48,564	69,801	81,345	58,433
Total repair	180,978	207,108	313,700	296,228	204,222
Grand total	579,188	683,759	795,482	949,146	585,965

Source: Canadian Shipbuilding & Ship-Repair Association.

Repair work continues to provide the backbone for Canada's shipyards. In recent years, it accounted for nearly half of the industry's employment and productivity. 5/ Repair work and conversions of commercial ships in Canadian

1/ "Canadian Shipbuilding," Marine Engineering/Log, February, 1984, p. 57.
2/ Henry M. Walsh, "Canadian Shipbuilding and Offshore and Artic Prospects," Maritime Reporter/Engineering News, June 1, 1983, p. 53.
3/ "Government Anomalies Infuriate Builders," Fairplay, Mar. 15, 1984, p. 32.
4/ "Value Declines at Shipyards in Canada," Journal of Commerce, November 20, 1984, p. 24B.
5/ Lynden Watkins, "Canada: Repair Reliance Pays Off," Shiprepair, August, 1984, p. 27.

shipyards rose from $134.4 million in 1979 to $243.9 million in 1981. The value of this work then decreased annually over the next 2 years, falling to $145.8 million in 1983. Repair and conversion of Canadian Government ships increased to $81.3 million in 1982, before declining to $58.4 million in 1983.

Imports of commercial vessels into Canada rose irregularly during 1980-83, reaching $778.1 million as shown in the following tabulation (in thousands of dollars): 1/

Year	Imports
1980	312,143
1981	526,789
1982	281,824
1983	778,144

Foreign imports totaled 38 vessels, or 198,743 gross tons in 1983, including 5 offshore drilling rigs and 16 supply vessels. No fishing vessels were imported. Record temporary entries of vessels occurred in 1982 and 1983 because of the low, temporary entry duty implemented by the Canadian Government. In the first 9 months of 1983, 94 vessels were imported on a temporary basis under this provision. 2/

The value of Canadian exports of commercial vessels declined by 50 percent during 1980-83, as shown in the following tabulation: 3/

Year	Value of Exports
1980	360,437
1981	210,931
1982	310,431
1983	179,799

In 1983, only three ships for export were delivered (2 jack-up drilling rigs and one deck freighter, totaling 11,200 gross tons).

Government Involvement

Several aspects of the Canadian Government's shipping policy affect the Canadian shipbuilding industry. One Government goal is to ensure the availability of adequate and economic shipping services for Canadian trade. Secondly, the Government encourages the shipping industry to take advantage of opportunities such as the export of Arctic resources and requires that Canadian flag vessels be used as much as possible in doing so as long as costs

---

1/ Henry M. Walsh, "Canadian Shipbuilding-1984," Maritime Reporter/Engineering News, Vol. 46, no. 11, July 11, 1984, p. 84. Data for 1984 are not available.

2/ "Government Anomalies Infuriate Builders," Fairplay, Mar. 15, 1984, p. 33.

3/ Op. cit., "Canadian Shipbuilding-1984," p. 84.

are reasonable. 1/ Both of these goals encourage production of commercial vessels in Canadian shipyards. In addition, the Government strives to maintain an efficient, defense shipbuilding capability. 2/ Canadian Government programs designed to aid shipbuilding and repair in Canada are discussed below.

The Shipbuilding Temporary Assistance Program was established in 1970 to provide a 17 percent subsidy for vessels built for export. Another program, the ship construction subsidy regulations provides for a 35 percent subsidy for fishing vessels and a 17 percent one on other commercial vessels built for Canadian owners. In 1975 the Canadian Government replaced these two programs with a Federal Government Shipbuilding Industry Assistance Program (SIAP), providing a lower subsidy. The 1983 subsidy level was 9 percent of total construction cost. 3/ Table C-40 shows the subsidy payments to shipyards by the Canadian Government. During 1979-83 (the latest year for which data are available), these subsidy payments totaled $376 million. The SIAP is scheduled to terminate for ships delivered after June 30, 1985. 4/ Additionally, from mid-1979 to 1981, the Canadian Government provided funding for important projects in the commercial ship-repair industry.

Table C-40.--Canadian Government subsidy payments to shipyards, 1979-83

Item	1979	1980	1981	1982	1983
Subsidy payments---1,000 dollars--	83,335	71,736	72,942	73,008	75,000
Subsidy as a percent of total production----------percent--	13.1	9.2	9.3	8.1	12.1
Performance improvement grants 1,000 dollars--	3,479	7,120	5,505	8,166	9,800

Source: U.S. Department of Transportation, Maritime Administration, Maritime Subsidies.

Regarding capital expenditures and modernization of the shipbuilding industry, the Canadian Government, since 1976, has matched up to 3 percent of the additional costs spent by shipbuilders on new construction. Also materials used to build Canadian ships are allowed a depreciation at 33 1/3 percent per annum on a straight-line basis. For all other vessels, a depreciation of 15 percent per annum on a diminishing balance basis is permitted. 5/

1/ U.S. Department of Transportation, Maritime Administration, February, 1983, p. 23-24.

2/ Henry M. Walsh, "Canadian Shipbuilding and Offshore and Arctic Prospects," Maritime Reporter/Engineering News, June 1, 1983, p. 56.

3/ Ibid.

4/ Henry M. Walsh, "Canadian Shipbuilding-1984," Maritime Reporter/Engineering News, Vol. 46, no. 11, July 11, 1984, p. 84.

5/ U.S. Department of Transportation, Maritime Administration, Maritime Subsidies, February, 1983, p. 26.

The Canadian Export Development Corporation ("EDC") provides financial support for exports of commercial vessels. The EDC ensures exports for up to 90 percent of a Canadian Shipbuilders' loss if a foreign customer defaults on his account. Foreign buyers can borrow up to 85 percent of the contract price of a purchase of Canadian-built vessels. 1/ In 1981 (the latest year for which data are available), a total of Cdn. $302.1 million in loans and guarantees was committed to shipbuilding.

On January 6, 1983, the Government announced legislation designed to promote Canadian shipbuilding. Among the provisions were:

1) extension of the customs zone to goods used in resource exploration and development from the 12-mile limit to the edge of the continental shelf;

2) imposition of a 25 percent duty on ships brought into Canadian coasting registry and a 20 percent duty on drilling rigs and platforms, except fishing vessels over 100 ft.;

3) retention of the 3 percent Performance Improvement Grant and extension of the 9 percent Shipbuilding Industry Assistance Program Subsidy for ships delivered by June 30, 1985.

The above measures were designed to give the Canadian shipbuilding industry a fairer chance to compete with foreign shipbuilders in the Arctic and Atlantic offshore markets. Most of the rigs, supply ships, dredges, etc. engaged in these activities have been imported into Canada. These provisions were viewed as an opportunity for Canadian yards to increase their share of standard manufacturing activity. However, according to the Canadian Shipbuilding and Ship Repairing Association, most of the possible benefits of this law have been nullified by the Petroleum Incentive Program. 2/

1/ Ibid.

2/ Henry M. Walsh, "Canadian Shipbuilding and Offshore and Artic Prospects," Maritime Reporter/Engineering News, June 1, 1983, p. 58.

APPENDIX D

H.R. 33 THE MARITIME REDEVELOPMENT BANK CHARTER ACT OF 1985

99TH CONGRESS
1ST SESSION

H. R. 33

To stimulate innovation, increase productivity, and improve the competitiveness of the maritime industry in the United States.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 3, 1985

Mr. BIAGGI (for himself, Mr. ANDERSON, Mrs. BOGGS, Ms. MIKULSKI, and Mr. FOGLIETTA) introduced the following bill; which was referred to the Committee on Merchant Marine and Fisheries

---

A BILL

To stimulate innovation, increase productivity, and improve the competitiveness of the maritime industry in the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Maritime Redevelopment Bank Charter Act of 1985".

SEC. 2. Title II of the Merchant Marine Act, 1936 (46 U.S.C. 1111 et seq.), is amended by adding at the end the following new sections:

"SEC. 216. ESTABLISHMENT OF THE MARITIME REDEVELOPMENT BANK OF THE UNITED STATES.

"(a) There is established a privately capitalized mixed-ownership incorporated enterprise in transition to a Government-sponsored private corporation to be known as the 'Maritime Redevelopment Bank of the United States' (hereafter in this title referred to as the 'Bank'). The Bank shall have succession until dissolved by Act of Congress.

"(b) The Bank is not an agency or instrumentality of the United States. No director, officer, or employee of the Bank shall be considered to be an officer or employee of the United States except as provided in this Act.

"(c) The Bank is a for-profit corporation with the purpose of stimulating private investment in maritime enterprise in the United States, principally through the performance of certain supplemental intermediate credit functions in secondary capital markets. Net earnings of the Bank after reasonable provision for possible losses shall be used for payment of dividends on capital stock. Any such dividends inuring to the United States as an equity investor shall be deposited in the general fund of the Treasury as miscellaneous receipts.

"(d) The Bank may establish its principal office and other offices in such place or places as the Bank considers necessary and appropriate in the conduct of its business, but the Bank shall be deemed, for purposes of jurisdiction and

venue in civil actions, to be a resident of the District of Columbia.

"(e) The Bank, including its franchise, capital, reserves, surplus, mortgages or other security holdings, and income, is exempt from all taxation imposed by any State, the District of Columbia, the Commonwealth of Puerto Rico, or any territory or possession of the United States, or by any county, municipality, or local taxing authority, except that any real property of the Bank is subject to such taxation to the same extent as other real property is taxed.

"(f) The President shall appoint, by and with the advice and consent of the Senate, not fewer than three interim directors from among individuals with knowledge and experience in public finance, venture capital, international trade, and transportation, who shall serve as the initial Board of Directors of the Bank until their successors are elected at the first annual meeting of stockholders, and are qualified. The interim directors shall arrange for an initial stock offering of founders stock, not more than 20 per centum of which may be owned by representatives of the shipbuilding industry and not more than 20 per centum of which may be vested in the trustees of union pension funds, and shall take whatever actions are necessary to establish the corporation, including the filing of articles of incorporation.

"SEC. 217. GENERAL POWERS OF THE BANK.

"(a) The Bank may, consistent with the purposes of the Maritime Redevelopment Bank Charter Act of 1985—

"(1) adopt, alter, and rescind bylaws;

"(2) adopt and alter a corporate seal, which shall be judicially noticed;

"(3) make agreements and contracts with persons and governmental entities without fiscal year limitation;

"(4) lease, purchase, accept gifts or donations of, or otherwise acquire, and own, hold, improve, use, or otherwise deal in or with, and sell, convey, mortgage, pledge, lease, exchange, or otherwise dispose of, any property, whether real, personal, and mixed, and any interest therein, without regard to Federal procurement laws;

"(5) sue and be sued in its corporate name and complain and defend in any court of competent jurisdiction;

"(6) represent itself, or contract for representation, in all judicial, legal, and other proceedings;

"(7) conduct its business without regard to any incorporation or nonresident corporation statute of any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, or any territory or possession of the United States;

"(8) select, employ, and fix the compensation (including pension plans, health benefits, incentive compensation plans, paid vacation, sick leave, and other fringe benefits) of such officers, employees, attorneys, and agents as are necessary for the transaction of the business of the bank, without regard to Federal civil service laws;

"(9) contract for goods and services and fix the compensation of expert consultants;

"(10) indemnify directors and officers of the Bank, as the Board of Directors finds necessary;

"(11) retain and use earnings without fiscal year limitation, and determine the character of, and the necessity for, expenditures and the manner in which such expenditures are or are to be incurred, allowed, and paid; and

"(12) exercise all other lawful powers necessary or incidental to the establishment of the Bank, the proper management of its affairs, the conduct of its business, and the implementation of the purposes of the Maritime Redevelopment Bank Charter Act of 1985.

"(b) An ultra vires action against the Bank may be brought only by the Attorney General of the United States.

"SEC. 218. BOARD OF DIRECTORS AND OFFICERS OF THE BANK.

"(a)(1) The Bank shall have a Board of Directors (hereafter in this title referred to as the "Bank Board") consisting of individuals who are citizens of the United States, of whom one shall be elected annually by the members of the Bank Board to serve as Chairman.

"(2) With respect to the period before the Bank Board issues its initial public offering of common and voting preferred stock but after the founders stock has been issued, membership on the Bank Board shall be divided between public and private members based upon the proportional equity contribution of the Federal Government to the Bank. Public members shall be appointed by the President, by and with the advice and consent of the Senate, from among individuals with knowledge and experience in public finance, venture capital, international trade, and transportation, shall begin service on the Bank Board on the date on which the initial private members are elected and qualified, and shall serve for a term of one year or until their successors have been appointed and qualified. Private members of the Bank Board shall be elected annually by the non-Federal stockholders of the Bank subject to cumulative voting of all such non-Federal stockholders until such time as the Bank Board issues an initial public offering of common and voting preferred stock.

"(3) After the initial public offering of common and voting preferred stock, a majority of the members of the Bank Board shall be elected by the common stockholders at each subsequent annual meeting of the Bank Board, and the remainder of such members shall be elected by the preferred stockholders.

"(4) No director appointed by the President may have any direct or indirect financial or employment relationship with the maritime industry during the time the director serves on the Bank Board. No director elected by the non-Federal stockholders of the Corporation shall vote on any action by the Bank Board relating to any matter in which the director has a direct or indirect financial interest, but the director may be present at meetings of the Bank Board at which those matters are voted on, may be included for purposes of determining a quorum, and may participate in discussions at any such meeting.

"(b) The Bank shall have a President, and such other officers as may be appointed by the Bank Board, at rates of compensation fixed by the Bank Board, and serving at the pleasure of the Bank Board. No individual other than a citizen of the United States may be an officer of the Bank. No officer or employee of the Bank may receive any salary or severance payment from any source other than the Bank

during the period of the officer or employee's employment by the Bank.

"SEC. 219. CAPITALIZATION OF THE BANK.

"(a)(1) Funds transferred to the Bank under subsection (b) shall constitute the equity contribution of the United States Government to the Bank. The Bank may also issue and have outstanding, in such amounts and at such par value as it determines, shares of common stock, to be known as 'founders stock' that shall carry voting rights and be eligible for dividends and that may only be sold to individuals and private entities authorized to document a vessel of the United States under section 12102 of title 46, United States Code. Additional receipts from other sources shall be deposited in the general surplus account of the Bank, and, at the discretion of the Bank Board, designated as capital reserves of the Bank. Equity investment in the Bank is considered an approved investment for purposes of section 607(c).

"(2) No financial institution may provide brokerage or underwriting services to the Bank unless it is also an equity investor in the Bank.

"(b) There is transferred to the Bank, as paid-in capital of the Bank—

"(1) all sums of money in the construction fund authorized under section 206;

"(2) all sums of money in the Federal Ship Financing Fund established under section 1102, relating to guarantees of obligations refinanced under this Act;

"(3) all sums of money received as excess payments in a trade-in/trade-out program under section 510(b);

"(4) all sums of money received as repayments of loans for the construction, reconstruction, or modification of vessels authorized under this Act;

"(5) all sums of money received as fees for the guarantee of obligations under section 220 and other fees associated with the provision of loans and other financial commitments by the Bank;

"(6) all sums of money received as income from the sale of obsolete vessels in the National Defense Reserve Fleet; and

"(7) all sums of money heretofore or hereafter appropriated under title V received as pro rata repayment of previously distributed sums under that title associated with the temporary transfer of a vessel to the coastwise trade under the authority of section 506.

"(c)(1) Not earlier than the beginning of the third year or later than the end of the seventh year of operation of the Bank, the Bank shall, by a majority vote of the Bank Board, issue and have outstanding, in such amounts and at such par

value as it may determine, two issues of capital stock, one common and one preferred, each of which shall carry voting rights and be eligible for dividends. Common stock shall be offered and sold in a manner to encourage the widest distribution to the American public. Preferred stock shall be offered and sold to and held only by investors eligible under subsection (a)(1) to hold founders stock. At the time of the initial offering of such common and voting preferred stock, holders of founders stock may convert their shares to shares of preferred stock upon such terms as the articles of incorporation provide or may sell such shares back to the Bank, and membership on the Bank Board shall change as provided in section 218(a)(3).

"(2) Common stock and preferred stock shall both be designated fully paid and nonassessable. Dividends shall be fixed at a rate determined by the Bank Board on an annual basis, and shall be cumulative. No dividend may be paid on the common stock when dividends on the preferred stock are in arrears. Preferred stockholders shall be entitled upon liquidation to a payment of not less than par value plus all accrued unpaid dividends prior to any payment to common stockholders. Preferred stock shall be convertible into shares of common stock at such time and upon such terms as the articles of incorporation provide.

"(d) The Bank may issue, in addition to the stock authorized by subsections (a) and (c), such nonvoting securities, bonds, debentures, and other certificates of indebtedness as the Bank Board authorizes.

"SEC. 220. SPECIFIC POWERS AND ACTIVITIES OF THE BANK.

"(a) To carry out its purposes the Bank may finance, cofinance, or refinance the construction, reconstruction, or modification of a project eligible under section 221 through its guarantee, loan, secondary market services, and insurance authority under this section. The Bank may accept as collateral for financing assistance—

"(1) a preferred ship mortgage or equipment trust certificate with or without recourse,

"(2) convertible debentures or stock warrants,

"(3) the assignment of charter-hire or contract of affreightment income, or

"(4) other instruments which may be pledged as security.

The Bank shall take into account the economic and fiscal soundness of each application for financial assistance based upon the Bank's analysis of the business plan and investment prospectus required by subsection (g)(2), and shall ensure that the aggregate risk and return for the Bank permit its operation on a sustaining basis.

"(b)(1) The Bank may guarantee and enter into commitments to guarantee—

"(A) the interest on and unpaid balance of the principal of any obligation, or the face amount of any discounted obligation, or any combination of debt obligations, including any obligation eligible to be guaranteed under title XI;

"(B) charter-hire payments under a hell-or-high-water charter party agreement executed incident to a lease financing agreement;

"(C) lease payments to a trustee under a syndicated sale and leaseback of a vessel to an operator;

"(D) residual value under a personal property lease or commercial loan by a financial institution;

"(E) an equipment lease of product and process technology developed by the National Shipbuilding Research and Development Corporation established by section 224; and

"(F) any obligation issued by a person or governmental entity to finance a leveraged buyout of a commercial shipyard in the United States for the purpose of modernizing such a facility under a business plan and investment prospectus approved by the Bank under subsection (g)(2).

"(2) An operator leasing a vessel for which the Bank guarantees the payment of charter-hire or residual value under a personal property lease under paragraph (1) (B) or (C) may withdraw funds from an existing capital construction fund established under section 607(a) in either a lump sum to be applied to the purchase price of the vessel at the termination of the lease, or in installments to be applied to periodic payments to a financial institution. Any such payment shall be considered a qualified withdrawal for purposes of section 607(f)(1)(A). The Bank may establish a priority lien on any capital construction fund utilized for such a purpose.

"(3) The Bank may make commitments to guarantee financing in the form of advancements of credits against future guarantees in exchange for early scrappng or trade-in of vessels to the Secretary of Transportation under section 510.

"(4) The Bank may refinance any outstanding debt obligation previously guaranteed under title XI without foreclosure, subject to the approval of a business plan and investment prospectus under subsection (g)(2) for an eligible project.

"(5) In exercising its guarantee authority under this subsection, the Bank shall give priority in providing financial assistance to projects incorporating—

"(A) innovative concepts in vessel and industrial product design, materials, and construction designed to create a competitive advantage in ocean shipping and to promote import substitution and export development in commercial industrial products;

"(B) design integration with emphasis upon producibility of vessels and industrial products in commercial shipyards, resulting in reductions in delivered cost and time of delivery and improved quality through statistical quality-control procedures and management information systems;

"(C) zone construction and pre-outfitting in the construction and fabrication of vessels and industrial products;

"(D) computer-integrated manufacturing in the construction or fabrication of vessels and industrial products to the maximum extent practicable; and

"(E) statistical evidence of quality control in manufacturing technology.

"(6) For purposes of this subsection, preliminary designs for vessels and industrial products may be considered adequate for the purpose of entering into preliminary commitments to make guarantees.

"(7) For purposes of this subsection, the Bank may guarantee, or to enter into commitments to guarantee—

"(A) not to exceed 90 per centum of the payment of the interest on and the unpaid balance of the principal of any obligation, or the face amount in the case of any discounted obligation, which is eligible under paragraph (1) (A) or (E) to be guaranteed under this Act; and

"(B) 100 per centum of the vessel charter hire, personal property lease, or lease payments of advanced manufacturing technology described in paragraph (1) (B), (C), or (D).

"(c)(1) Notwithstanding any other law, the Bank may service, accept, sell or resell, offer participations or pooled interests, or otherwise deal in, at prices and on terms and conditions determined by the Bank, preferred ship mortgages as defined in the Ship Mortgage Act, 1920, equipment trust certificates, and other collateral enumerated in paragraph (2) issued in connection with a project eligible under section 221, with or without endorsement or guarantee by the Bank, by the Secretary of Transportation, or by any person or Governmental entity under an agreement with the Bank. The Bank may create, accept, execute, or otherwise administer, in all respects, such trusts, receiverships, conservatorships, liquidating or other agencies, or other fiduciary and representative undertakings and activities as are necessary and appropriate for financing purposes.

"(2) The Bank may issue, and may buy, sell, hold, underwrite, and otherwise deal in securities through the offering of participations or pooled interests under paragraph (1) in the form of debt obligations including notes, debentures, bonds, or other evidence of indebtedness, and trust certificates of beneficial ownership, or both, under such terms and with such maturities as are determined by the Bank, secured by preferred ship mortgage, equipment trust certificate, assignment of charter-party hire or contract of affreightment income, equity interest in vessel residual value, stock warrants, or convertible debentures. Those securities may be sold in smaller denominations than represented by the mortgages, equipment trust certificates, or other collateral themselves. The Bank may sell those securities directly in domestic or foreign capital markets. Mortgages, equipment trust certificates, or other collateral set aside under the offering of participations or pooled interests shall at all times be adequate to insure the timely principal and interest payments on these securities. Any sale of securities issued by the Bank shall be treated in the accounts in the same manner as if those purchases were from the sale of the underlying assets.

"(3) The Bank may issue securities for purchase by the Secretary of the Treasury through the Federal Financing Bank for resale or retention for investment, but the aggregate amount of those securities outstanding at any one time

may not exceed $2,000,000,000. Those securities shall be redeemable at the option of the Bank before maturity in such manner as may be stipulated in those securities with the approval of the Secretary of the Treasury. Those securities shall be in such form and denominations and have such maturities and be subject to such terms and conditions as may be agreed upon by the Bank and the Secretary of the Treasury. Those securities shall bear interest at a rate fixed by the Secretary of the Treasury, taking into account current average market yield on outstanding marketable obligations of the United States with remaining periods of maturity comparable to the securities issued by the Bank under this paragraph. The Secretary of the Treasury shall purchase any securities issued under this paragraph, and for that purpose, the Secretary of the Treasury may use as a public debt transaction the proceeds of the sale of any securities issued under chapter 31 of title 31, United States Code, and the purposes for which securities may be issued under that chapter are extended to include any such purchase of securities under this paragraph. Payment under this paragraph of the purchase price of those securities issued by the Bank and repayments thereof by the Bank shall be treated as debt transactions of an agency of the United States.

"(4) The Bank may guarantee securities based upon pools or trusts of the mortgages, equipment trust certificates,

or other collateral eligible for purchase or acceptance by the Bank for a project eligible under section 221, and may act as insurer of those guaranteed securities. Those securities shall bear interest at a rate equal to the rate on the underlying mortgages or equipment trust certificates and reflect income from other collateral less an allowance for servicing and other expenses as determined by the Bank. The Bank shall have, with respect to securities under this paragraph, all the powers it possesses with respect to securities under paragraph (2), and the provisions of that paragraph shall apply to guarantees under this paragraph. Nothing in this paragraph shall be construed to prohibit the Bank from guaranteeing payment of only a part of the principal and interest on securities under this paragraph.

"(5) The Bank may make direct loans to persons or governmental entities for eligible projects and issue securities based on such loans through the offering of participations or pooled interests in the same manner and under the same conditions as under paragraph (2).

"(6) The Bank may guarantee commercial loan originations based upon pools or trusts of mortgages, equipment trust certificates, and other collateral for an eligible project in the same manner and under the same terms and conditions as under paragraph (4).

"(7) The Bank may purchase, discount, rediscount, sell, or negotiate, with or without its endorsement or guarantee, and guarantee notes, drafts, checks, bills of exchange, acceptances, including banker's acceptances, cables, transfers, and other evidence of indebtedness, with such adjustments to the terms of trade encompassing ocean shipping transportation arrangements which shall, to the maximum extent practicable, increase the portion of United States foreign trade transported in United States-flag vessels.

"(8) The Bank may purchase, sell, and negotiate futures or options based upon charter parties and contracts of affreightment with the purpose of increasing the portion of United States foreign trade transported in United States-flag vessels.

"(9) Notwithstanding any other law, any security issued or guaranteed by the Bank may be sold to any person or governmental entity and it freely transferable.

"(10) Any security issued or guaranteed by the Bank under this section shall be considered a lawful investment, and may be accepted as security for all fiduciary, trust, and public funds held for investment or deposit by the United States or any officer thereof and are considered approved investments under section 607(c). Securities issued or guaranteed by the Bank shall plainly state that those securities are not obligations of the United States and are not guaranteed

by the United States, but are exempt securities within the meaning of the securities laws.

"(d) The Bank may establish or participate in the establishment, through syndication, joint venture, or participation agreement, of a multi-bank export trading company under the Export Trading Company Act of 1982 (Public Law 97–120), for the purpose of increasing the portion of United States foreign trade transported in United States-flag vessels.

"(e) The Bank may underwrite loan, export, war risk, and political risk insurance incidental to its financing activities, as necessary to protect its outstanding investments and obligations, through risk-sharing arrangements including co-insurance with private mortgage insurance companies, reinsurance, or the establishment of a captive offshore insurance corporation.

"(f) The Bank may establish a revolving fund to finance, on a cost-reimbursable basis from the Department of Defense, national defense features for installation in vessels constructed in foreign and domestic shipyards for documentation under the laws of the United States in meeting the requirements of section 502(h) of this Act.

"(g)(1) Within one year after the date of the incorporation of the Bank, the Bank Board shall prepare and adopt by majority vote a business-type budget and plan and an investment prospectus to govern the financing activities of the

Bank, to be updated annually, including an ownership plan, financial plan, marketing plan, and operating plan.

"(2) The Bank Board shall require that each applicant for financing assistance by the Bank likewise prepare a business plan and investment prospectus which must be approved by the Bank if the applicant is to receive financing assistance under this title.

"(h) The Bank shall charge fees in connection with loan commitments, insurance, guarantees, or other services based upon the cost of those services, plus a reasonable rate of return.

"SEC. 221. ELIGIBLE PROJECTS.

"(a) Upon application, the Bank may finance the construction, reconstruction, or modification under section 220 of—

"(1) except as provided in subsection (b), any vessel eligible for documentation under the laws of the United States, without restriction on the transfer of an interest in that vessel so long as that vessel is subject to an agreement with the Secretary of Transportation under paragraph (3);

"(2) any vessel or any industrial product in a commercial shipyard of the United States; or

"(3) any vessel—

"(A) under a licensing or coproduction agreement, or joint venture between a commercial shipyard in the United States and a foreign shipyard, or

"(B) for operation under a consortium, joint venture, or joint service agreement or other cooperative arrangement between a citizen of the United States and a person or governmental entity,

for operation in United States foreign trade. An vessel described in subparagraph (B) must, in order to be eligible under this section, enter into an agreement with the Secretary of Transportation that provides that the vessel shall be subject to requisition and use under section 902(a).

"(b)(1) The Bank shall give preference in financing to an application for the construction, reconstruction, or modification of a vessel authorized under subsection (a)—

"(A) in a commercial shipyard of the United States;

"(B) under a licensing or coproduction agreement or joint venture between a commercial shipyard of the United States and a foreign shipyard; or

"(C) for operation under a consortium, joint venture, or joint service agreement between a citizen of

the United States and a person or governmental entity for operation in United States foreign trade.

"(2) If the Bank finances the construction, reconstruction or modification of a vessel outside the United States, the vessel shall not be eligible to receive operating differential subsidy under title VI.

"(3) In the case of a replacement for a vessel built with construction differential subsidy under title V which is receiving operating differential subsidy under title VI and is the subject of an operating differential subsidy termination agreement, the Bank may finance the construction, reconstruction, or modification of that vessel only if no less than half of the funds received under the termination agreement are expended for the construction, reconstruction, or modification of a vessel or vessels in a commercial shipyard of the United States.

"SEC. 222. BUILD AND CHARTER FINANCING.

"(a) The Bank may finance the construction, reconstruction, or modification of vessels in commercial shipyards of the United States under this section for sale or lease and documentation under the laws of the United States.

"(b) The Bank may finance such a vessel—

"(1) at the request of an agency or department of the United States Government for conveyance to that agency or department;

"(2) at the request of an agency or department of the United States Government for operation in United States foreign trade, subject to an agreement with the Secretary of Transportation under section 221(a)(3), in such manner as will encourage the establishment of international cooperative agreements in commercial vessel construction and operation;

"(3) for operation in the coastwise or intercoastal trades on such conditions as will encourage accelerated replacement of obsolete tonnage and revitalize the liquid bulk crude and product carrier, dry cargo, and passenger vessel segments of those trades; or

"(4) for maintenance in the National Defense Reserve Fleet, as defined in section 11 of the Merchant Ship Sales Act of 1946 (50 U.S.C. App. 1744), by the Secretary of Transportation.

"(c) In financing a vessel under subsection (a), the Bank shall incorporate in its contractual arrangements—

"(1) a negotiated procurement process that encourages, where appropriate, competition from among consortia comprised of a shipyard, a vessel operator, and a financial institution in the design, construction, and financing of a standard-design vessel suitable for construction utilizing advanced ship construction techniques and manufacturing technology;

"(2) incentives and penalties for contract performance in excess of, or failure to meet, contract specifications in relation to vessel and component delivery and performance, and shipyard productivity and quality control improvement;

"(3) national defense features approved by the Secretary of the Navy under section 502(i), subject to the availability of funds under section 220(f); and

"(4) a requirement for an efficient main propulsion system and such other features as will contribute to improved fuel efficiency, reliability, and reduced operating cost of the vessel.

"(d) Section 804(a) and 805(a) do not apply to a vessel financed under this section.

"(e)(1) A vessel financed under this section is not subject to the buy national requirements of section 505 as long as the nation of foreign origin of any major component of the vessel imposes no similar offset or buy national requirement upon the construction of a vessel in a commercial shipyard of that nation.

"(2) A vessel financed under this section is eligible for a waiver from the Secretary of Transportation from any buy national requirement applicable to material and components under the navigation laws if the imposition of such a require-

ment would result in an unreasonable increase in the cost or time of delivery of that vessel.

"SEC. 223. FINANCIAL RECORDING REQUIREMENTS AND AUDIT OF ACCOUNTS OF THE BANK.

"(a)(1) The accounts of the Bank shall be audited annually at the Bank's expense. That audit shall be conducted, in accordance with generally accepted auditing standards and other requirements as prescribed by the Comptroller General of the United States, by independent certified public accountants, or by independent licensed public accountants certified or licensed by a regulatory authority of a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, or any territory or possession of the United States. The audit shall be conducted at the place or places where the records of the Bank are normally kept. The books, accounts, financial records, reports, files, and all other papers, things, or property belonging to or in use by the Bank necessary to facilitate an audit shall be made available to the person conducting the audit, and full facilities for verifying transactions with the balances or securities held by depositaries, fiscal agents, and custodians shall be afforded to that person.

"(2) The Comptroller General shall review each such audit of the Bank's accounts which covers a period during which Government equity capital has been invested in the

Bank, such review to be conducted on a cost-reimbursable basis with the Bank.

"(b) The Bank shall submit the auditor's report and a copy of the review of the audit by the Comptroller General to the President and the Congress not later than six months following the close of the fiscal year with respect to which the audit was made. The report shall state the scope of the audit and include such statements as are necessary to present fairly the Bank's assets and liabilities, surplus or deficit, with an analysis of the changes therein during the year, supplemented in reasonable detail by a statement of the Bank's income and expenses during the year, together with the auditors' opinion and the Comptroller General's review of those statements. The report shall be printed and made available to the public at the Bank's expense.

"SEC. 224. ESTABLISHMENT OF NATIONAL SHIPBUILDING RESEARCH AND DEVELOPMENT CORPORATION.

"(a) There is established a privately capitalized Government-sponsored private corporation to be known as the 'National Shipbuilding Research and Development Corporation' (hereafter in this title referred to as the 'Corporation'). The Corporation shall have succession until dissolved by Act of Congress.

"(b) The Corporation is not an agency or instrumentality of the United States.

"(c) The Corporation is a for-profit corporation for the purpose of stimulating private capital investment in shipbuilding research and development in both product and process technology.

"(d) The Corporation may establish its principal office and other offices and may conduct its research and development activities in such place or places as it may consider necessary and appropriate in the conduct of its business, but the Corporation shall be deemed, for purposes of jurisdiction and venue in civil actions, to be a resident of the District of Columbia. The establishment of the Corporation shall not preempt the incorporation or syndication of other research and development organizations or activities.

"(e) The President shall appoint, by and with the advice and consent of the Senate, three interim directors from among individuals with knowledge and experience in manufacturing technology, research and development, public finance, investment banking, and venture capital, who shall serve as the initial Board of Directors of the Corporation until their successors are elected, at the first annual meeting of stockholders, and are qualified. The interim directors shall prepare a business-type budget and plan and an investment prospectus for the Corporation, arrange for an initial stock offering, and take whatever further actions are necessary to

organize the Corporation, including the filing of articles of incorporation.

"SEC. 225. GENERAL POWERS OF THE CORPORATION.

"(a) The Corporation may, consistent with the purposes of the Maritime Redevelopment Bank Charter Act of 1985—

"(1) adopt, alter, and rescind bylaws;

"(2) adopt and alter a corporate seal, which shall be judicially noticed;

"(3) enter into agreements and make contracts (including joint ventures, syndication, and participation agreements) with, make grants to, and receive grants from persons and governmental entities;

"(4) lease, purchase, accept gifts or donations of, or otherwise acquire, and own, hold, improve, use, or otherwise deal in or with, and sell, convey, mortgage, pledge, lease, exchange, or otherwise dispose of, any property, whether real, personal, or mixed, and any interest therein;

"(5) sue and be sued in its corporate name and complain and defend in any court of competent jurisdiction;

"(6) represent itself, or contract for representation, in all judicial, legal, and other proceedings;

"(7) conduct its business without regard to any incorporation on nonresident corporation statute of any

State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, or any territory or possession of the United States;

"(8) select, employ, and fix the compensation (including pension plans, health benefits, incentive compensation plans, paid vacation, sick leave, and other fringe benefits) of such officers, employees, attorneys, and agents as are necessary for the transaction of the business of the corporation;

"(9) contract for goods and services and fix the compensation of expert consultants;

"(10) indemnify directors and officers of the Corporation, as the Board of Directors finds necessary; and

"(11) exercise all other lawful powers necessary or incidental to the establishment of the Corporation, the proper management of its affairs, the conduct of its business, and the implementation of the purposes of the Maritime Redevelopment Bank Charter Act of 1985.

"(b) An ultra vires action against the Corporation may be brought only by the Attorney General of the United States.

"SEC. 226. BOARD OF DIRECTORS AND OFFICERS OF THE CORPORATION.

"(a) The Corporation shall have a Board of Directors (hereafter in this title referred to as the 'Corporation Board'), consisting of individuals who are citizens of the United States, of whom one shall be elected annually by the Corporation Board to serve as Chairman. Members of the Corporation Board shall be elected annually by the common stockholders of the Corporation subject to cumulative voting of all common stockholders. No stockholder or stockholder group or trustee for such a stockholder or stockholder group may elect, either directly or indirectly, through the vote of subsidiaries or affiliated companies, nominees, or any person subject to the direction or control of that stockholder, stockholder group, or trustee, a majority of the members of the Corporation Board. No director elected by the common stockholders of the Corporation may vote on any action by the Corporation Board relating to any matter in which that director has a direct or indirect financial interest, but the director may be present at meetings of the Corporation Board at which those matters are voted upon, may be included for purposes of determining, a quorum, and may participate in discussions at any such meeting.

"(b) The Corporation shall have a President, and such other officers as may be appointed by the Corporation Board, at rates of compensation fixed by the Corporation Board, and

serving at the pleasure of the Corporation Board. No individual other then a citizen of the United States may be an officer or employee of the Corporation. No officer or employee of the Corporation may receive any salary or severance payment from any source other than the Corporation during the period of that officer or employee's employment by the Corporation.

"SEC. 227. CAPITALIZATION OF THE CORPORATION.

"(a) The Corporation may issue and have outstanding in such amounts and at such a par value as it may determine shares of capital stock, which shall carry voting rights and be eligible for dividends. Only individuals who are citizens of the United States and private entities authorized to document a vessel of the United States under section 12102 of title 46, United States Code, shall be eligible to purchase such stock.

"(b) The Corporation may issue, in addition to the capital stock authorized by subsection (a), nonvoting securities bonds, debentures, and other certificates of indebtedness as may be authoritzed by the Corporation Board.

"SEC. 228. SPECIFIC POWERS AND ACTIVITIES OF THE CORPORATION.

"(a) The Corporation shall undertake, consistent with the guidelines for investment policy and research and development activities of the Corporation prescribed in subsection (c), the following activities:

"(1) The Corporation shall conduct research and development in both process and product technology, including the development of computer-integrated manufacturing systems applicable to the construction and fabrication of vessels and industrial products in commercial shipyards, and in manufacturing by vendors and component suppliers.

"(2) The Corporation shall conduct product-oriented marketing research in—

"(A) export development of high-value-added vessels and industrial products suitable for construction or fabrication in commercial shipyards, and

"(B) import substitution, opportunities utilizing steel and other structural materials in construction and fabrication through the application of computer-integrated manufacturing technology.

"(3) The Corporation shall undertake other applied research for the purpose of improving overall shipbuilding industry innovation and productivity, and promoting competitiveness with imports of vessels or industrial products suitable for construction or fabrication in commercial shipyards.

"(4) The Corporation shall design and implement worker retraining programs in commercial shipyards.

"(5) The Corporation shall finance its research and development activities through syndication, research and development limited partnerships with the Corporation serving as general partner, participation agreements, and joint ventures, and shall promote diffusion of technology developed by the Corporation through patent interchange, royalty, license, cross-license, and other arrangements in furtherance of the purposes of the Corporation and the Maritime Redevelopment Bank Charter Act of 1985.

"(6) The Corporation shall develop, test, and certify design and performance standards for vessels and components.

"(7) The Corporation may establish or participate in the establishment of a multishipyard export trading company under the Export Trading Company Act of 1982 (Public Law 9-120) to assist in the export of vessels and industrial products developed by the Corporation at individual shipyards specializing in the construction or fabrication of such vessels or products.

"(b) For purposes of this section, the term 'research and development' expressly excludes manufacturing except—

"(1) as a demonstration project, or

"(2) incidental to the marketing of process or product technology designed for commercial application.

"(c) In the conduct of its research and development activities and investment policy the Corporation shall adhere to the following guidelines:

"(1) Information or technology discovered or developed by the Corporation shall be reported to all stockholders of the Corporation.

"(2) All stockholders of the Corporation are entitled to use on an equitable basis the results of any process or product technology developed by the Corporation.

"(3) All stockholders of the Corporation are entitled to an irrevocable, nonexclusive equivalent license of both patentable and know-how technology developed by the Corporation, without payment of royalties.

"(4) The Corporation may not impose on any stockholder—

"(A) any restriction on the stockholder's own research and development activity;

"(B) any obligation to pool or make available results of any previous research and development, although stockholders may engage in patent interchange and cross-licensing agreements negotiated

at arms length if necessary to further the purposes and activities of the Corporation;

"(C) any restrictions on how the stockholder may use any of the results of the Corporation's research and development activities, except that the results may be licensed to nonstockholders of the Corporation with the agreement of the other stockholders under such terms and conditions as are specified in the Corporation's articles of incorporation, business plan, and investment prospectus; or

"(D) any restriction on the stockholder's manufacturing or marketing activities with respect to any product or service either related or unrelated to any of the Corporation's research and development results.

"(5) The Corporation shall notify the Attorney General of the United States as to the identity of its stockholders and shall also furnish a copy of the Corporation's articles of incorporation and a general description of the Corporation's activities.

"(6) All product or process technology developed by the Corporation shall be made available to nonstockholders on an equal access basis under such terms

and conditions as the Corporation Board may determine.

"(d) This section does not limit the rights of individual stockholders of the Corporation to enter into subsequent joint development activities in the application of process technology and the manufacturing and marketing of product technology developed by the Corporation under an appropriate business review letter issued by the Attorney General of the United States.

"(e) If the Corporation or any stockholder or stockholders of the Corporation engages in any action in violation of the guidelines contained in subsection (c), the district court of the United States for any district in which the Corporation or the stockholder or any of the stockholders in violation of their guideline resides or may be found shall have jurisdiction, except as otherwise provided by law, upon petition of the Attorney General of the United States, to grant such equitable relief as may be necessary or appropriate to prevent or terminate that action.

"SEC. 229. FINANCIAL REPORTING REQUIREMENTS AND AUDIT OF ACCOUNTS OF THE CORPORATION.

"(a) The accounts of the Corporation shall be audited annually at the Corporation's expense. The audit shall be conducted in accordance with generally accepted auditing standards by independent certified public accountants or by

independent licensed public accountants certified or licensed by a regulatory authority of a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, or any territory or possession of the United States. The audit shall be conducted at the place or places where the records of the Corporation are normally kept. All books, accounts, financial records, reports, files, and other papers, things, or property belonging to or in use by the Corporation and necessary to facilitate an audit shall be made available to the person conducting that audit, and full facilities for verifying transactions with the balances or securities held by depositaries, fiscal agents, and custodians shall be afforded to that person.

"(b) The Corporation shall submit the report of each audit to the President and the Congress not later than six months following the close of the fiscal year with respect to which the audit was made. The report shall set forth the scope of the audit and include such statements as are necessary to present fairly the Corporation's assets and liabilities, surplus or deficit, with an analysis of the changes therein during the year, supplemented in reasonable detail by statements of the Corporation's income and expenses during the year. The report shall be printed and made available to the public at the Corporation's expense.

"SEC. 230. PREFERRED STATUS.

"A mortgagee of a vessel financed by the Bank under this Act and documented under the laws of the United States shall have preferred status under subsection D of the Ship Mortgage Act, 1920 (46 U.S.C. 922), as long as the indenture trustee is a citizen of the United States.".

O