

**1976**

**Report on Survey of U.S.  
Shipbuilding and Repair Facilities**



**U.S. DEPARTMENT OF COMMERCE  
Maritime Administration**

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REPORT ON SURVEY OF U.S.  
SHIPBUILDING AND REPAIR FACILITIES

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Prepared by:

Office of Ship Construction  
Division of Production

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## Introduction

In compliance with the requirements of Merchant Marine Act of 1936, as amended, 1/ the Office of Ship Construction conducts an annual survey to obtain information from the shipbuilding and ship repair industry that is used primarily to determine if an adequate mobilization base exists for purposes of national defense and for use in a national emergency. This report on the 1976 survey of U.S. shipyard facilities was prepared by the Division of Production, Office of Ship Construction, and is for general use within the Maritime Administration (MarAd) and other Government agencies.

The statistical data accumulated by the survey is a major input into the Shipyard Production and Mobilization Model (SPAMM), a quantitative assessment of the nation's ship construction and ship repair capability. This capability is periodically compared with Department of Defense scenarios involving various contingency attrition rates and emergency civilian shipping requirements to determine the adequacy of the shipbuilding mobilization base, including ship repair and

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### 1/ Section 210

"It shall be the duty of the Secretary of Commerce to make a survey of the American merchant marine, as it now exists, to determine what additions and replacements are required to carry forward the national policy declared in Section 101 of this Act, and the Secretary of Commerce is directed to study, perfect, and adopt a long-range program for replacements and additions to the American merchant marine so that as soon as practicable the following objectives may be accomplished:... Fourth, the creation and maintenance of efficient shipyards and repair capacity in the United States with adequate numbers of skilled personnel to provide an adequate mobilization base."

### Section 211

"The Secretary of Commerce is authorized and directed to investigate, determine, and keep current records of.....(g) The number, location, and efficiency of the shipyards existing on the date of the enactment of this Act or thereafter built in the United States."

### Section 502(f)

"The Secretary of Commerce, with the advice of and in coordination with the Secretary of the Navy, shall, at least once each year, as required for purposes of the Act, survey the existing privately owned shipyards capable of merchant ship construction, or review available data on such shipyards if deemed adequate, to determine whether their capabilities for merchant ship construction, including facilities and skilled personnel, provide an adequate mobilization base at strategic points for purposes of national defense and national emergency.

reactivation of the Maritime Administration reserve fleet and the U.S. Navy reserve fleet.

The survey also provides a data base that is used to evaluate the feasibility of proposed shipbuilding programs. Determinations are made as to which existing shipyards might construct proposed ships consistent with ship size and delivery date requirements. The need for construction of new facilities to meet the demands of proposed shipbuilding programs can also be identified. The data gathered by the annual survey is also used extensively in MarAd responses to queries received from a variety of interests, including members of Congress, the Secretary of Commerce, the Department of Defense, and the Office of Management and Budget.

Each year in late spring, Standard Form 17, "Facilities Available for the Construction or Repair of Ships," is mailed to approximately 200 American shipyards and ship repair facilities. The survey form was developed jointly by MarAd and the Navy. A completed Form 17 represents a detailed description of a shipbuilding or ship repair facility. The information requested, and available for official use, can be reviewed on a blank Form 17, shown herein as Appendix A. In the 1976 survey, a graving drydock characteristics summary and a floating drydock characteristics summary were appended to Standard Form 17 to better identify the facilities characteristics.

Upon receipt of completed Form 17 from industry, MarAd forwards a copy to the Office of the Coordinator for Ship Repair and Conversion which maintains appropriate records of available facilities and capacities of various shipyards and repair plants to enable the Department of Commerce and the Department of Defense to use such facilities to the best advantage. Form 17 also serves as a primary data input to the Industry Evaluation Board Summary Analysis conducted by the Bureau of Domestic Commerce in cooperation with MarAd. The Federal Preparedness Agency in the General Services Administration is also a recipient of this information.

### General

The annual shipyard survey of 1976 has been completed, and the information collected has been organized and condensed in the following narrative, exhibits, and tabulations to focus attention on those elements that are most often requested from this office. Appendix B is an especially valuable statistical abstract of data gathered from those companies responding to the annual survey. It lists the nation's major shipbuilding and ship repair and drydocking yards sorted on a coastal basis. Information is displayed pertaining to the size and type of each building position, drydock, and berth space, employment, and remarks regarding yard activities.

MarAd has examined drydock data submitted by shipyards in the 1976 survey. In preparing Appendix B, the following criteria were developed

in order to establish the nominal maximum ship size that could be accommodated in each drydock:

For floating drydocks, the maximum ship length is as given by the shipyard. The maximum width was determined by allowing a 2-foot clearance at each side between the ship and the wing wall.

For graving docks, the maximum ship length was determined by allowing a 2-foot clearance at each end between the ship and the inside of the dock at the floor. The maximum width was determined by allowing a 2-foot clearance on each side between the ship and each side of the dock entrance at the sill.

It is recognized that there are several types of floating drydocks and graving docks, and that under certain circumstances additional clearance would be necessary between the ship and the dock body. Permissible ship sizes requiring additional clearance may be determined by simple calculation from the above criteria.

### Major Shipbuilding Facilities

A major shipyard is defined for purposes of this report as one having at least one building position, either an inclined way, a side-launching platform or a building basin, with the capability to accommodate a minimum ship size of 475 feet length overall (LOA) and a beam of 68 feet. These dimensions represent the smallest ship size that would be considered for mass production during a mobilization period. There are presently 26 shipyards in this category, which are identified and geographically located in Exhibit 1.

Despite the drastic decline in the shipbuilding market and the continuing uncertainties in the industry, U.S. shipyards plan to spend approximately \$132.5 million for improvement of facilities during fiscal year 1977. Since enactment of the Merchant Marine Act of 1970, the U.S. shipbuilding industry has expended \$1.04 billion in capital improvements for new building basins, new floating drydocks, cranes of unprecedented lifting capacity, plus a wide range of new or modernized shops and facilities. Emphasis has been on prefabrication of large subassemblies and preoutfitting of components using modular techniques. Exhibits 2 through 8 are general arrangement plans outlining the new and reconstructed building facilities in seven of these yards. Detailed descriptions of these exhibits are included in this report.

As of July 1, 1976 (see Exhibit 9), MarAd was subsidizing a construction backlog of 32 large oceangoing ships in eight shipyards with a total contract value of \$2.2 billion. These were in addition to 41 non-subsidized ships under construction or on order. MarAd was also



providing mortgage guarantee insurance for 345 vessels and 83 LASH lighters under contract in 46 construction facilities throughout the country (see Exhibit 10). The total Title XI guarantee value of these vessels and barges is approximately \$1.57 billion.

Table I has been prepared to satisfy the frequent question as to how many building positions are available to build a specified ship. 1/ A single shipway or basin may have several building positions depending on the size of the ships being constructed. For example, the 1,200-foot by 192-foot basin at Bethlehem's Sparrows Point shipyard can accommodate one 265,000-dwt. tanker or four of the smaller mobilization ships. The ship types listed, with the exception of the mobilization ships, are those presently under construction or recently delivered to commercial service. The number of building positions varies from 120 for the small mobilization ship to two for the huge 390,770 dwt. tanker. Length overall and beam are given for all ships and deadweight tonnage for the bulk carriers. An important consideration that is ignored in Table I is the common shipbuilding practice of laying a keel on a building position already occupied by another ship. For example, in a 700-foot basin a complete 610-foot containership and the stern section of a second ship could be constructed simultaneously. This production procedure, analyzed periodically by SPAMM, maximizes the use of shipbuilding facilities, minimizes the construction period, and increases the number of ships that can be produced in a given period of time.

Table II is a somewhat different presentation of the data, meaningful to many requesting information from the annual survey. In lieu of actual ships, maximum ship length is used to determine the number of shipways or basins available. In this tabulation the emphasis is on the number of individual facilities available and not on the number of ships that can be constructed. Again using Sparrows Point as an example, Table II lists the 1,200-foot by 192-foot basin as one facility regardless of what type of ship is constructed in it. Table I indicates that there are eight building positions for a ship 475 feet LOA at Sparrows Point, whereas Table II indicates that the yard has five individual shipways capable of constructing a ship 475 feet in length. Exhibit 11 is a histogram displaying the reduction in the number of available shipways as the maximum ship length increases.

There appears to be sufficient U.S. shipyard capacity to handle merchant shipbuilding requirements in the near future. Exhibit 12 indicates when each of the major commercial yards needs new contracts in order to utilize facilities and to maintain current rates of employ-

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1/ The usual accompanying questions to this query, e.g., when the ships can be delivered and what effect a new proposal will have on the existing program or work under contract, can be answered from SPAMM output.

ment. Estimates on need for new business have been determined by the Maritime Administration based on methodologies developed for the Shipyard Production and Mobilization Model (SPAMM). Many of these yards presently have building facilities available to expand employment levels if new contracts can be secured.

Following is a brief description of major U.S. commercial shipyards capable of constructing oceangoing or Great Lakes merchant ships, with a minimum size of 475 feet by 68 feet.

1. Bath Iron Works Corporation

Bath Iron Works Corporation, located on the Kennebec River in Bath, Maine, is an old, established shipyard engaged in both Navy and commercial ship construction, as well as Navy overhaul and repair work. The yard has a history of proven diversity, having constructed various types of ships including containerships, tankers, destroyers and guided-missile frigates. Bath has built a total of 153 destroyers for the Navy. In the late 1960's and early 1970's, six containerships were delivered to American Export Lines; and in 1975, the yard completed a series of five 25,000-dwt. "handy-size" tankers.

In May 1977, the company will deliver the last of four large sophisticated roll-on/roll-off cargoliners (MA Design C7-S-95a) for States Steamship Company. Other commercial ships under contract are a 26,600-dwt. containership for Matson Navigation Company and two 14,600-dwt. containerships (MA Design C5-S-73b) for American Export Lines. Bath Iron Works is the lead shipbuilder for the Navy's Guided-Missile Frigate (FFG-7 Class) program. The lead ship, the USS OLIVER HAZARD PERRY, is under construction at Bath; and the Navy has awarded the company a \$224 million follow-on contract for the construction of five additional FFG-7 Class guided-missile frigates, the last of which is scheduled for delivery in May 1981. The yard is also currently engaged in the major overhaul of the USS DETROIT (AOE-4) for the Navy.

In 1974, Bath completed a major expansion and modernization program. The upgrading of facilities included the reconstruction of two shipways to accommodate ships of 700 feet in length between perpendiculars (LBP) with a maximum beam of 130 feet, or two ships per way with a beam of 54 feet each; the installation of a 220-ton level luffing crane with sufficient outreach to erect units on all shipways; and new steel fabrication shops and equipment that have increased steel throughput capacity by 50 percent.

In addition to the building positions recently upgraded, BIW has one other shipway that can accommodate a ship 650 feet in length with a beam of 88 feet. During the year, the company purchased and installed a 9,600-ton floating drydock that can handle ships up to

500 feet by 81 feet. There is also a special partial drydock used exclusively for the installation and repair of sonar domes.

Two wharves and a pier provide a total of 2,900 linear feet for outfitting and repair work. Each wharf is serviced by a 25-ton rotating crane and the pier by a 90-ton rotating crane.

BIW operates a supporting facility, the Hardings plant, located three miles from the shipyard, where the initial steel fabrication takes place. At this plant, steel is blasted and sprayed, cut, straightened or shaped. The steel is then transported to Bath by truck or rail where it is joined together into subassemblies for final erection at the shipway. The yard is not considered to be automated although some numerically controlled burning is employed.

At mid-1976, the administrative and production work force totaled 3,300, slightly less than a year earlier.

## 2. Bethlehem Steel Corporation - Sparrows Point Yard

Sparrows Point, the largest of Bethlehem Steel's seven shipyards, is located on the Patapsco River in the Baltimore, Maryland, metropolitan area. Established in 1891, the yard became part of the Bethlehem organization in 1916 and served as a major shipbuilder during two world wars. During World War II, Sparrows Point constructed 101 vessels of 16 different classes. During the 1950's and 1960's, it was among the most active yards in the nation, specializing in series construction of standard sizes of Bethlehem-designed tankers, as well as freighters and containerships. Sparrows Point is primarily a shipbuilding yard. Its large building basin and support facilities are capable of constructing crude carriers of sizes up to about 300,000-dwt.

In 1975, the yard completed the MASSACHUSETTS, the first of five 265,000-dwt. VLCCs (MA Design T10-S-101b) contracted for in 1972 and 1973. Two sister ships, the NEW YORK and the MARYLAND, were delivered in the summer of 1976, and two more of these 1,100-foot-long crude carriers are currently in production. Sparrows Point's construction backlog also includes two 27,340-dwt. container/unitized cargo ships (MA Design C8-S-85d) for Farrell Lines and a large floating drydock for the Navy.

To provide the capability for construction of VLCCs millions of dollars were invested in facilities improvement: establishing new production and materials-handling methods, installing new and sophisticated systems and equipment, and developing new design concepts and engineering techniques. The major components of this program, which was completed in 1974, are the new building basin for construction of ships as large as 1,196 feet by 196 feet and a 68,000-square-foot panel shop for fabrication of steel. This fabrication shop is

capable of constructing panels up to 60 feet square, 4 feet in depth, and weighing up to 200 tons. Other improvements include the structural strengthening of pier number 1 to accommodate VLCCs, a numerically controlled gas plate-cutting machine and automated plate and shape blasting-painting equipment. Exhibit 2 is a general arrangement plan outlining the VLCC construction facilities.

Complementing the large basin, Sparrows Point has four building ways. Two of these ways can accommodate a maximum ship size of 900 feet by 108 feet, and two can accommodate ships up to 650 feet by 90 feet. These four ways are presently being used as platen areas. Activation of the two larger ways could be accomplished quickly, but activation of the two smaller ways would require extensive refurbishing. The yard does not have drydocking facilities except for the building basin which is used for construction work. Four outfitting berths are available with a combined length of 3,970 linear feet of space serviced by a six tower cranes ranging in capacity from 30 to 50 tons. Several locomotive cranes of various capacities are also available.

The total work force at the Sparrows Point yard was 4,040 at mid-1976, down about 200 from last year.

3. General Dynamics Corporation - Quincy Shipbuilding Division

The Quincy Shipbuilding Division of General Dynamics Corporation is located on Quincy Bay, eight miles south of Boston, Massachusetts. This shipyard, which was purchased from Bethlehem Steel Corporation in 1963, delivered 18 ships to the Navy from 1964 to 1973. These included four nuclear submarines, two ammunition ships, six replenishment oilers, two submarine tenders, and four dock landing ships. In 1973, the last of three revolutionary barge-carrying ships (MA Design C8-S-82a) built for Lykes Brothers was completed. Twelve 125,000-cubic-meter liquefied natural gas carriers (LNGs) are presently on order or under construction at the Quincy yard, with the first ship scheduled for delivery in May 1977.

To provide the tools and facilities to efficiently build these LNG tankers in series production, General Dynamics in 1975 completed a major improvement and modernization program. In addition to the conversion of two conventional sliding ways to large building basins, other recent improvements at Quincy included: a steel fabrication facility, materials-handling equipment, a 250-ton transporter, a plate cleaning and blasting facility, a double-bed flame planer, a double-bed flat bar stripper, a web cutter with 19 torches in tandem, an angle fabricator, two web stiffener welding gantries, a T-beam fabricator, two plate stiffeners, a butt welding gantry, a panel turn-

over fixture, and two 40-ton cranes. In addition, a 1,200-ton Goliath crane, the largest in the Western Hemisphere, has been installed for transferring the spherical LNG tanks from the barge on which they will be delivered to the LNG ships under construction.

The company in 1975 also committed several millions of dollars for tools, machinery and buildings at its newly acquired Charleston, S.C., facility for fabrication of the spherical aluminum tanks for the LNGs at Quincy.

Especially noteworthy is the ingenious construction schedule for the LNGs. Shipways No. 11 and No. 12 have been demolished and new Basins No. 11 and No. 12 erected to accommodate ships up to 860 feet in length and 144 feet in beam. Since the LNGs are 936 feet LOA, hull erection in Basins No. 11 and No. 12 will exclude the bow. Following float-out from No. 11 or No. 12, the ships will be floated into Basin No. 7 for bow erection and sphere installation. Basin No. 7 can accommodate a maximum ship size of 936 feet by 143 feet. The bows of the LNGs will be constructed at the inboard end of Basin No. 6 and will be lifted by the 1,200-ton Goliath crane over into No. 7 where they will be attached to the hull. The spheres will be barged into the outboard end of No. 6 and lifted into No. 7 for installation. Basin No. 8, presently not in use, and Basin No. 6 can accommodate ships 860 feet LOA and 123 feet in beam. Exhibit 3 is a general arrangement plan showing the new LNG construction facilities.

The Quincy yard has extensive capability to do topside and inboard repair work. Four piers and a wet basin are available with a total dockside accessibility of 4,600 linear feet. Each pier and the wet basin is serviced by adequate crane capacity for outfitting and general repair work. The building basins can also be used as drydocks for repair work when not in use for new construction or conversion. Automatic Data Processing, including AUTOKON 71, is being used, and greater implementation is planned for the future.

Employment at General Dynamics, Quincy, has increased from 4,650 at mid-1975 to 4,800 at mid-1976. Total labor force is about 650 at the General Dynamics plant in Charleston, S.C., which is producing the spherical tanks for the LNG ships.

#### 4. Maryland Shipbuilding & Drydock Company

Maryland Shipbuilding & Drydock Company, a subsidiary of Fruehauf Corporation, is located on the south bank of the Patapsco River in Baltimore, Maryland. Although primarily a repair and conversion yard in recent years, Maryland built the

following vessels in the 1960's: two containerships, one oceanographic research vessel, one hydrofoil, and two 195-foot trawler/factory ships, the first stern ramp fish-processing trawlers to be built in the United States. The company's Industrial Products Division engages in non-marine work such as (1) the design, manufacture and installation of large steam surface condensers for the utility industry; (2) general machine repairs to pumps, turbines, and other industrial machinery; and (3) heavy structural steel fabrications.

The yard is currently building a large self-unloading rice barge which is part of a 25,000-dwt. integrated tug-bergo. (Southern Shipbuilding Corporation is building the tug.) Other work at Maryland includes the major overhaul of a Navy LSD, merchant ship repair, and fabrication of industrial products.

Maryland is completing the final phase of a major modernization and expansion program, the main features of which are:

- Installation of a new floating drydock 827 feet long by 150 feet between wing walls with a lifting capacity of 36,000 long tons. This dock, which can handle ships up to about 125,000 dwt., will be used for launching newly constructed vessels, as well as for ship repair and conversion work;
- Lengthening of the yard's one building way to permit construction of ships up to 850 feet by 110 feet, compared to the previous maximum of 630 feet by 96 feet;
- Modernization of the panel fabrication system;
- Automatic pre-blast equipment and a new building and for blasting and painting, and a totally enclosed final-blast building; and
- Computer lofting and a new tape-controlled, automatic burning machine.

In addition to the new floating drydock, Maryland has two other floating drydocks used primarily for repair and conversion work. The maximum ship sizes that the older drydocks can accommodate are 775 feet by 110 feet and 715 feet by 91 feet. There are 5,650 feet of pier-side berthing available for topside and inboard repair. Each pier and drydock is served by adequate crane capacity.

The current administrative and production work force at mid-1976 was approximately 1,150, down from 1,700 at mid-1975.

5. Newport News Shipbuilding & Dry Dock Company

Newport News Shipbuilding & Dry Dock Company, located on the James River in Newport News, Virginia, is the largest single shipbuilding complex in the nation. The company, founded in 1886, is a subsidiary of Tenneco, Inc. Newport News has built 20 aircraft carriers, more than 20 nuclear-powered submarines, and about 120 other naval surface ships. Commercial vessels delivered by Newport News include 71 cargo ships, 81 tankers, 63 passenger ships (most notably the famed superliner UNITED STATES), and more than 50 other vessels.

The yard is currently at work on 16 nuclear-powered ships for the U.S. Navy - two aircraft carriers, four guided missile cruisers, and ten attack submarines. Also in production are three 125,000-cubic-meter LNGs (MA Design LG9-S-94a) and three ULCCs of 390,770 dwt. each (MA Design T11-S-116a), the largest commercial ships ever ordered in the United States.

These six vessels are under construction in Newport News Shipbuilding's new multimillion dollar North yard. Using a phased expansion plan, many of the facilities in the existing South yard supported the new operation as it evolved into a complete shipyard in its own right. While the new yard will not be completed until December 1976, construction of the large commercial vessels under contract is proceeding on schedule. The new North yard is adjacent to the existing yard on 150 acres of land reclaimed from the James River. In the new building basin 1,600 feet long, 250 feet wide and 44 feet deep, one ULCC or large LNG and part of a second can be built simultaneously. A steel production facility which includes modern panel lines and supporting equipment, a 900-ton Goliath gantry crane, and two outfitting berths have also been provided. The Goliath crane serves the new graving dock and final assembly area and has a height of 234 feet overall, a girder clearance of 200 feet and a span between rail centers of 540 feet. Ultimately, the new steel-fabrication complex will have a capacity of about 200,000 tons of steel annually. Exhibit 4 is a general arrangement plan showing the principal construction facilities in the new commercial shipyard.

The Newport News South yard, covering some 320 acres exclusive of the new facility, has five inclined shipways, two of which can accommodate a maximum ship size of 940 feet by 125 feet, two a ship size of 715 feet by 93 feet, and one a ship size of 447 feet by 93 feet. This last building way can be extended to accommodate ships of 649 feet in length. In addition to the shipways, the South yard also has two large building basins, that can handle ships up to 1,100 feet by 136 feet and 960 feet by 124 feet, ser-

viced by a 310-ton gantry crane.

Within the confines of the South yard there are 70 production shops for steel processing and fabrication and the manufacture of machinery components. Newport News has one of the largest foundry capabilities in the United States. A fairly recent acquisition was a completely automated steel handling facility, including numerical control for lofting and cutting. Other computer applications in the yard include AUTOKON 71 (contracted for from MarAd), PERT, used in planning and scheduling, and automatic data processing in material control and accounting activities.

In addition to the two building basins, the South yard also has three graving docks that can be used for new construction, repair, or conversion. The largest of these can accommodate a maximum ship size of 862 feet by 114 feet. Nine piers for outfitting and topside repair are available with a combined berthing space of approximately 12,400 linear feet. These piers are serviced by cranes ranging in capacity from 28 tons to 156 tons. In the new North yard, there is one outfitting berth 1,670 feet in length and one mooring berth 1,000 feet long.

At mid-1976, the total labor force at Newport News was 23,600, an increase of about 1,000 over a year earlier.

#### 6. Seatrain Shipbuilding Corporation

In 1969, Seatrain Shipbuilding Corporation, a subsidiary of Seatrains Lines, Inc., leased the principal facilities of the former Brooklyn Navy Yard to build 225,000-dwt. tankers on an assembly-line basis. Construction contracts were signed for five of these VLCCs (MA Design T10-S-92a), and the first, the BROOKLYN, was delivered in 1973. The second ship, the WILLIAMSBURGH, was completed in 1974.

In January 1975, the company fell victim to soaring construction costs under fixed-priced contracts and the worldwide depression in the shipping market for large tankers. The contract for one of the five 225,000-dwt. crude carriers was cancelled, and construction was halted on the two tankers under construction. The Department of Commerce's Economic Development Administration (EDA) agreed to guarantee a \$40 million working capital loan from two major banks, and this loan has enabled the yard to continue work on the VLCCs under construction. One of these ships is scheduled for completion in December 1976 and one in December 1977.

In the absence of new tanker orders, Seatrains in 1975 contracted to build eight ocean deck barges and a unique ice breaker barge. All of these barges were to be delivered by the end of 1976. This type of



work lends itself to both the yard's panel line facility and manpower resources which are approximately 75 to 80 percent hull type personnel. In August 1976, the company signed a contract with McAllister Towing Company to construct a 300-foot by 72-foot ocean-going container deck barge. In September 1976, Seatrain signed a contract to build two 568-foot by 86-foot barges, part of two sea-going tug-barge RO/RO units for Transway International Corporation. Marinette Marine will build the two tugs, but Seatrain is the prime contractor.

Although the facilities that existed in 1969 included three large fabricating buildings and two massive graving docks to accommodate a maximum ship size of 1,094 feet by 143 feet, Seatrain has expended several million dollars on facility improvements and modernization. Automation, including AUTOKON 71, is widely used by the yard in steel processing.

Steel handling in this yard is extremely efficient and is designed to ensure that substantially all work, except the actual hull erection in the graving dock, is performed indoors in temperature-controlled, protected areas. Raw steel is pre-processed in the plate preparation building where it is shotblasted, coated, and precision cut with automated, numerically-controlled cutting machines. The plate is then transferred to either the flat or curved panel building for fabrication. In the flat panel building, automatic welding machines are used to make up rectangular modules with a maximum weight of 200 tons. Bow and stern shell modules are fabricated in the curved panel building where bending rolls are capable of curving 2-inch plate into cylindrical shapes up to 30 feet in length. The modules are then painted in a temperature-controlled, sheltered building equipped with high volume fans and filters to provide a safe, non-toxic environment for workers. The modules are moved on 200-ton transporters to the graving docks. Exhibit 5 is a general arrangement plan of Seatrain's building basins and piers.

A smaller graving dock has been reactivated and has been used for barge construction, bottom painting, and repair work. This dock can accommodate a maximum ship size of 740 feet LOA and 108 feet in beam.

Although the yard is presently specializing in new construction, there is over 3,190 feet of berthing space available that could be used for topside repair. Most of this pier space is serviced by several 75-ton capacity whirley cranes working separately or in tandem to lift completed modules into place.

At mid-1976, employment at the yard totaled between 1,900 and 2,000 compared to 3,100 before the six-month furlough of all employees in 1975.

7. Sun Shipbuilding & Dry Dock Company

Sun Ship, located in Chester, Pa., is a complete shipbuilding and manufacturing complex encompassing nearly 200 acres bordering on the Delaware River. In its 59 years of operation, the yard has delivered more than 600 vessels, mainly commercial ships. In recent years, Sun has concentrated on roll-on/roll-off ships and medium-sized tankers of its own design. In addition to its shipbuilding, conversion and repair activities, the company also engages in the manufacture of heavy industrial equipment including welded pressure vessels, plate work, machinery, and oil refinery and chemical works equipment.

Sun's current backlog of orders for new ship construction consists of two 130,000-cubic-meter LNGs, two Sun-designed double hull "ecology" class crude oil carriers, and one roll-on/roll-off ship.

In 1976, Sun completed the final phase of a major capital improvement program which enhanced the shipyard's ability to fabricate the larger, more sophisticated ships which are expected to be part of the coming generation of commercial vessels. This expansion and modernization program has provided Sun Ship with a new level "shipbuilding platform," a two-section floating drydock capable of lifting 75,000 tons, an 1,100-foot outfitting pier, a new plate burning shop and other shipbuilding support facilities. On the new level shipbuilding slab, which is served by three 250-ton cranes, two halves of a ship as large as 1,400 feet by 195 feet can be constructed, or two smaller vessels 700 feet in length or less can be built simultaneously. For launching, each half of a large ship is rolled individually to sections of the new drydock and then welded together in the river. The ship is brought to the pier for outfitting completion. Sun's new drydock, which is capable of handling vessels up to 400,000-dwt., is one of the world's largest floating drydocks. It is serviced by four 25-ton gantry cranes. Exhibit 6 is a general arrangement drawing of the yard's new shipbuilding facilities.

In addition to the new shipbuilding platform, the company has two active conventional sliding ways that can handle ships as large as 745 feet by 129 feet. The yard has a total of 3,900 feet of usable berthing space. Sun's 800-ton barge crane is used for both construction and major repair work. Its heaviest lift to date has been a completely outfitted deckhouse weighing 785 tons.

The shipyard's total work force at mid-1976 was 3,700, down slightly from a year earlier.

8. Alabama Dry Dock and Shipbuilding Company

Alabama Dry Dock and Shipbuilding Company (ADDSCO) is located approximately 30 miles from the Gulf of Mexico on Mobile Bay. The yard is situated on Pinto Island across the river from the city of Mobile, Alabama. Although the shipyard constructed 102 tankers and 20

cargo vessels during World War II, it has since been predominantly a repair and conversion facility. During the past year, the company continued its facility improvements, primarily to increase its capability to build offshore drill rigs and vessels for the petroleum industry. ADDSCO currently has one semi-submersible rig and a large pipe-laying barge under construction.

The shipyard has three side-launching shipways, each of which can accommodate a maximum ship size of 523 feet by 68 feet, and one sliding way which can handle vessels as large as 620 feet by 90 feet. All of these ways are too small to construct today's mammoth ships. ADDSCO also has three floating drydocks that can handle maximum ship sizes of 750 feet by 100 feet, 620 feet by 83 feet, and 380 feet by 70 feet. There is also 9,370 feet of berthing space available at seven finger piers for topside and inboard repairs. There are 19 revolving gantry cranes with capacities varying from 12 tons to 65 tons available to serve the shipway and berthing areas. A 275-ton Goliath bridge crane, which straddles the slip between piers K and L, is used for repair work and for outfitting drill rigs.

ADDSCO, as of mid-1976, employed a labor force of 3,730, an increase of about 500 over the previous year.

#### 9. Avondale Shipyards, Inc.

Avondale Shipyards, a subsidiary of Ogden Corporation, is located on the west bank of the Mississippi River approximately nine miles upstream of New Orleans, Louisiana. Avondale has developed into one of the largest and most diversified shipyards in the country. The yard has constructed dry cargo ships, tankers, Navy ships, Coast Guard cutters, offshore drill rigs and drillships, and has the distinction of being the only U.S. shipyard to have built LASH vessels. Twenty were delivered to various shipowners from 1970 to 1975.

Ships under construction or on order as of October 1, 1976 included three 125,000 cubic meter LNG carriers (MA Design LG9-S-107a), six 164,000-dwt. tankers for Standard Oil Co. of Ohio and Exxon, and the jumboizing of two Farrell Lines containerships (MA Design C8-S-85c). In addition, conditional contracts have been signed for construction of three 51,000-dwt. product tankers (MA Design T5-M-119a). The orderbook also included one semi-submersible offshore drilling rig scheduled for completion in December 1976, two 27,500-ton Navy fleet oilers (AO-177 and AO-178), one oceangoing bulk barge and one cutter-head dredge.

In late 1975, Avondale completed a multimillion-dollar facilities improvement program to "tool up" for the construction of large LNG ships. The three to five position shipway, used in the destroyer escort program, has been reconstructed and expanded to two large positions to accommodate the LNG program. Exhibit 1 is a general arrangement plan of the new shipways and floating drydock. Two ships, each 960 feet by 176 feet, can be built simultaneously in this new facility. To facilitate launching, Avondale constructed a new floating drydock 900 feet long,

260 feet wide and 78 feet high with 220 feet clear width inside the wing walls. The lift capacity is 81,000 long tons. The dock is serviced by a 200-ton gantry crane on the supporting wharf. In addition to its use as a launching platform in new construction, this drydock has given the company the capability of performing a variety of conversion and major repair work. Additional buildings and equipment to supplement the yard's mechanized materials-handling and fabrication systems are also part of Avondale's recent expansion program.

Besides the new building positions for the LNGs, Avondale has a side-launching construction facility that can accommodate ships as large as 1,200 feet by 130 feet and weighing up to approximately 15,600 tons. Three large oceangoing vessels can be constructed simultaneously on this shipway, and as many as six smaller vessels can be constructed simultaneously if they are 600 feet or less in length.

A unique assembly method, whereby large sections of a ship are moved horizontally from different building positions, is employed by Avondale. A ship will be situated and worked on in three different building positions between keel laying and launching. For relatively small vessels, the yard has perfected a system of down-hand welding of the hull which is mounted on a rotating jig. Modern construction methods and steel processing facilities have made Avondale one of the nation's most productive shipyards. No U.S. shipbuilder has had more success with series production of commercial ships. The yard offers almost 3,600 feet of berthing space, serviced by six 30-ton to 50-ton rotating gantry cranes. A 600-ton floating heavy lift barge is also available at the berths. A small floating drydock, 378 feet by 68 feet, is used for repair of smaller ships, river boats, and barges.

Yard employment, at 6,300, has remained substantially unchanged since a year ago.

10. Bethlehem Steel Corporation - Beaumont Yard

This shipyard, located on the Neches River in Beaumont, Texas, was established in 1916 by Beaumont Shipbuilding and Drydock Company, which in addition to repair and conversion work, built C1-A cargo ships and Navy minesweepers during World War II. Bethlehem acquired the yard in 1947 and has pioneered in the design and production of mobile oil drilling rigs. The Beaumont plant has been one of Bethlehem's most successful operations and is one of the world leaders in production of offshore drilling rigs and drillships. It is also an experienced builder of oceangoing barges and is capable of producing large merchant ships.

Bethlehem-Beaumont is currently engaged mainly in work for the petrochemical industry, but the backlog of major new construction has dwindled to one jack-up drilling rig that is scheduled for completion in late 1976.

The Beaumont facility is highly mechanized. In 1973, the company completed a multimillion-dollar modernization program, including a new panel line and new materials-handling facilities. Bethlehem - Beaumont has one side-launching way that can accommodate ships up to approximately 842 feet by 96 feet. The yard also has a smaller side-launching way which is used for barge and module construction. One floating drydock is available which can handle vessels as large as 650 feet by 83 feet. The Beaumont plant has 4,050 feet of berthing space served by adequate crane capacity for outfitting and general repair work.

Employment at the yard was 1,320 at mid-1976, down from 3,075 a year earlier.

11. Galveston Shipbuilding Company

Galveston Shipbuilding Company, formerly a division of Kelso Marine, Inc., covers 25 acres of waterfront on Galveston Island's bay side adjacent to the Intra-Coastal Canal in Galveston, Texas. The yard began operations in 1966 and has been primarily a builder of barges and tugs, although it has the capability of building tankers up to about 35,000 dwt.

In 1974, the shipyard completed construction of a 35,000-dwt. integrated tug/barge (ITB) unit for Seabulk Tankers, Ltd. and in the fall of 1976 delivered a 42,000-dwt. catamaran tug/barge combination to Hvide Shipping, Inc. for U.S. coastal trade. The company has begun construction of two 469-foot chemical tank barges which will provide work until the first quarter of 1978.

Galveston Shipbuilding has one building way (side launching) on which oceangoing ships can be built, the maximum vessel size being about 700 feet by 100 feet. A present limitation is that, except at the launch site where the water is approximately 20 feet deep, the water depth on the way to the channel is only about 12 feet. However, by means of pontoons (sectional barges fitted together) a vessel with up to an 18-foot or 20-foot draft could be floated out to Galveston harbor. Launching weights of hulls are kept as low as possible with final installation of equipment done at the Galveston municipal pier. Since the yard is not geared to major machinery installation work, machinery is installed by a sub-contractor.

In addition to its large side-launch way, Galveston Shipbuilding has a smaller shipway served by a 750-ton syncrolift. In the absence of a drydock, arrangements must be made to drydock large vessels at Todd-Galveston or Levingston Shipbuilding Company. Since the former Kelso yard does not have an outfitting berth, outfitting is done at the municipal pier in Galveston.

In mid-1976, Galveston Shipbuilding Company's total work force was 400.

12. Ingalls Shipbuilding Division/Litton Industries

The Ingalls Shipbuilding Division, a wholly owned subsidiary of Litton Industries, Inc., is actually two separate shipyards. Located on the Gulf of Mexico at Pascagoula, Mississippi, Ingalls is a diversified shipbuilding complex experienced in the construction, conversion and overhaul of commercial ships and Navy combatants and auxiliaries. In addition, the yard participates in ship systems analysis and design, operational effectiveness analysis, logistic system analysis, and ship design concepts.

As of October 1, 1976, the backlog of work at the Pascagoula shipyard consisted of four LHA amphibious assault ships and 26 Spruance-class (DD-963) destroyers. No commercial vessels are currently on order.

The older of the two yards is referred to as the East Bank yard. It has been in operation for 38 years, engaging primarily in new construction of commercial cargo ships and tankers, and in January 1974 completed a series of highly productive containerships. The yard has six inclined shipways. Maximum ship sizes which can be accommodated are: four ways 650 feet by 90 feet, one way 690 feet by 85 feet, and one way 550 feet by 80 feet. The East Bank plant has one small graving dock which has been used for construction of nuclear-powered submarines but is currently being used mainly for repair work. A wharf and four piers serviced by cranes with a 50-ton maximum capacity provide a total of 3,700 feet of berthing space for outfitting and topside repair.

The ultramodern West Bank yard, completed in 1970, was designed and equipped for series production using modular construction methods. The yard is geared to assembly-line construction of large Navy and merchant ships. The West Bank yard does not have conventional inclined shipbuilding ways. Instead, fabricated steel and minor subassemblies are brought from the fabrication, panel and shell shops to the subassembly area where they are erected into major subassemblies, which in turn move to the module assembly area. These areas are divided into five bays, each of which can produce 225-foot-long, 6,000-ton modules. After modules are completed in the module assembly area, they are moved to the integration area where they are erected into a complete ship. The completed ship is then moved onto a launch pontoon which is subsequently floated and moved to a deep water area where it is sunk and the ship launched. The West Bank yard at the present time can launch a maximum ship size of 820 feet by 176 feet. It is estimated that the various assembly and subassembly areas are the equivalent of six conventional inclined ways in terms of the number of ships that could be delivered annually. Approximately 4,400 feet of berthing space, serviced by cranes varying from 25 tons to 200 tons, are available for outfitting.

Ingalls Shipbuilding Division at mid-1975 employed a total labor force of 23,760, a slight increase over a year earlier.

13. Levingston Shipbuilding Company

Levingston, one of the leading producers of offshore drilling rigs, was founded in 1933. The 100-acre plant is strategically located on the Sabine River at Orange, Texas, approximately 30 miles inland from the Gulf of Mexico. Gulfport Shipbuilding Corporation in Port Arthur, Texas, was purchased in 1970 by Levingston to supplement Levingston's construction and repair facilities. In 1975, Levingston became a wholly owned subsidiary of Ashland Oil, Inc.

Since the inception of offshore oil drilling, most of the yard's work has been related to this industry, primarily in the construction and repair of offshore drilling rigs and related floating equipment. However, Levingston is not limited to serving the petrochemical industry. To date, the yard has built 65 drill barges, 25 tenders, eight drillships, seven jack-ups, and six semi-submersibles. Levingston has designed a sizeable portion of the rigs constructed in the yard. As of August 1, 1976, the company's orderbook consisted of one semi-submersible, four jack-up rigs, and two drill ships.

An expansion and modernization program is presently underway at the Orange, Texas, yard. Some of the improvements incorporated in the program are: a new panel shop, numerically-controlled cutting equipment, an automatic blasting and paint shop, a new subassembly construction area, and a new gantry crane.

Levingston has one side-launch building way with a maximum ship size of 1,100 feet by 90 feet, on which oceangoing ships could be built in the event of national emergency. In addition, there is a small conventional shipway and four floating drydocks, the largest of which can accommodate a vessel 420 feet by 120 feet. Total usable berthing space is about 2,400 feet.

The current work force at Levingston's Orange plant is 2,010, and at Gulfport Shipbuilding Corporation, Levingston's subsidiary, total employment is 840.

14. Marathon LeTourneau Company - Gulf Marine Division

Marathon Manufacturing Company, the world leader in production of offshore drilling rigs, launched its new Gulf Coast shipyard, the Gulf Marine Division, in 1971 with a commitment of several millions of dollars. This shipyard is located on a 133-acre tract with a 2,500-foot frontage on the ship channel at the Port of Brownsville, Texas. In addition to the construction of offshore drilling rigs, the yard has the capability of fabricating and launching drillships, barges, work boats, tugs, supply vessels, and large merchant ships. Marathon's Vicksburg, Miss. plant and another in Longview, Texas, serve as support facilities for the Brownsville yard.

As of October 1, 1976, the Gulf Marine Division and Marathon's Vicksburg yard were each building one self-elevating (jack-up) drilling rig. Both rigs were scheduled for delivery in late 1976. The

only other construction contract at the the Brownsville yard was for a super tender with capability to erect its own derrick set during off-shore operations. The Vicksburg plant has no other construction work.

The Brownsville yard has one shipbuilding way with a maximum ship size of 1,100 feet by 150 feet on which oceangoing ships could be constructed in the event of national emergency. Modular construction techniques are combined with conventional shipbuilding methods. Large module sections are fabricated on a forming and subassembly slab about 400 feet by 200 feet, which is actually an extension of the yard's building way. A 250-ton gantry crane travels on rails which run the full length of the slab and building way. The crane lifts the subassembly sections from the slab to the launchway, and the sections are joined to form the completed vessel which is then side-launched. For outfitting purposes, there is one 500-foot-long wharf.

At mid-1976, the total work force at the Brownsville plant was about 1,100, down from 1,600 a year earlier.

15. Tampa Ship Repair & Dry Dock Co., Inc.

Founded in 1948, Tampa Ship Repair & Dry Dock is the largest ship repair facility on the West Coast of Florida. It is located at Hooker's Point on Tampa Bay in Tampa, Florida. During World War II, the company built Navy auxiliary vessels and C2 cargo ships for the Maritime Commission.

Since World War II, Tampa Ship has been a major Gulf Coast repair yard, serving many of the tanker fleets operating on the Gulf. During the Viet Nam conflict, the yard renovated and reactivated several Victory ships and played a major role in the upgrading of the Military Sealift Command tanker fleet. In 1972, the year the facility was purchased by the American Ship Building Company, Tampa Ship completed the conversion of a C1-M-AV1 cargo ship to a deep sea drillship; and a year later it built two hulls for a large, semi-submersible drilling rig under construction at Bethlehem-Beaumont.

Although Tampa Ship is primarily a repair facility, this shipyard has the capability to build large oceangoing ships. Current new construction consists of a 350-foot 100-foot deck barge for the offshore oil industry.

Tampa Ship has one sliding way which can accommodate a maximum ship size of about 600 feet by 150 feet. The shipway is served by three 40-ton gantry cranes. There is one graving dock that can handle vessels up to 550 feet by 75 feet, but present plans call for work to begin in early 1977 on an additional graving dock 900 feet by 132 feet which will be used for repair and conversion work. The new dock will be capable of drydocking tankers up to 105,000-dwt., the largest vessel that can enter into the Tampa Bay area. The yard presently has 2,700 feet of berthing space.

Mid-1976 employment at the Tampa yard was approximately 700, the same level as a year earlier.



16. Bethlehem Steel Corporation - San Francisco Yard

Bethlehem's San Francisco shipyard, which traces its beginning back to 1849, is the oldest yard in the United States from a standpoint of continuous service. One of the largest repair yards in the country, it offers a complete range of repair and reconditioning services and can handle conversion and jumboizing work, as well as a wide variety of industrial work. It is also capable of constructing large oceangoing ships.

During World War II, the yard, with the help of facilities leased from the Navy, built 72 ships including 52 Navy combat vessels. In addition, approximately 2,500 Navy and commercial vessels were repaired or converted at the yard during that period.

Since World War II, the most noteworthy new construction at the San Francisco yard included: five Mariner class cargo ships; four Title XI oil tankers (33,000 dwt.); one wine tanker; four Navy destroyer escorts; and four Title V cargo ships (MA Design C4-S-1q and C4-S-1t). However, in the last few years the shipyard has concentrated its building activities within the specialized field of large seagoing barges.

Except for the last of a series of 400-foot deck barges, the yard has no new construction work. During the year, repair and overhaul business was also slow.

Bethlehem - San Francisco has one building way. It is a conventional end-launch type and can accommodate ships up to 550 feet by 90 feet. The yard's mammoth floating drydock (maximum vessel size 950 feet by 144 feet) has a lifting capacity of 65,000 long tons and can handle ships up to about 230,000 dwt. This drydock, designed by Bethlehem and built at the San Francisco yard, is capable of serving the large tankers that will be transporting crude oil from Alaska to West Coast ports. This Bay Area facility also has a second floating drydock (maximum vessel size 700 feet by 94 feet) and about 2,170 linear feet of usable berthing space.

The total work force in July 1976 was 750, down slightly from a year earlier.

17. FMC Corporation - Marine and Rail Equipment Division

FMC Corporation's Marine and Rail Equipment Division, originally known as Gunderson Brothers Engineering Corporation, is located on the Willamette River in Portland, Oregon. This 76-acre facility, which is also a major manufacturer of rail cars, is an experienced builder of barges, ferry boats and marine equipment.

In 1972 and 1973, the company contracted to build six 35,000-dwt. gas turbine-powered electric drive tankers. The first of these ships was delivered in 1975 and the second was completed in 1976. Four are still under construction. These tankers will be chartered, for use in the domestic trade, to Chevron Shipping Company, a wholly owned subsidiary of Standard Oil Company of California.

To expand its shipbuilding capability to include construction of oceangoing ships, FMC in 1970 undertook a major improvement program. Included in this expansion program was the acquisition of 23 acres of land adjacent to its existing facility, purchase of a 200-ton whirley crane, new types of welding equipment, a 1,000-ton press, and a computer-operated burning machine for cutting steel plates. FMC can fabricate steel modules weighing up to the 200-ton limit of the crane and transport them to the shipway for erection. Modular living quarters complete with interior decor, carpeting and drapes, are erected to reduce outfitting time and cost.

The yard has one side-launching shipway that can accommodate a maximum ship size of 700 feet by 100 feet. This building position is serviced by one 200-ton and one 50-ton capacity crane.

FMC has one 600-foot outfitting dock but no drydocks. Outfitting and drydocking can be done in the nearby Port of Portland facility.

The total employment at the FMC plant is about 2,000, of which 1,140 are involved in marine work.

18. Lockheed Shipbuilding and Construction Company

The Lockheed Shipbuilding and Construction Company, a wholly owned subsidiary of Lockheed Aircraft Corporation, is located on the southern perimeter of Puget Sound's Elliott Bay at Seattle, Washington. In the past, the 86-year-old yard has concentrated on Navy ships, having constructed a series of destroyers, amphibious transport docks, ammunition ships, and the USNS SEALIFT, a roll-on/roll-off cargo ship operated by the Military Sealift Command. Lockheed has constructed several ferry boats and in 1973 delivered the 640-foot bulk carrier, SUGAR ISLANDER.

The Seattle firm also operates a substantial ship repair facility serving approximately 150 vessels a year and has a profitable industrial products division.

Lockheed currently has under construction a U.S. Coast Guard ice breaker, the POLAR SEA, and two 643-foot submarine tenders for delivery to the Navy in 1978 and 1979. This AS contract, awarded in 1974, marked the company's return to Navy shipbuilding.

The yard has three inclined shipways that can accommodate maximum ship sizes of 650 feet by 95 feet, 650 feet by 90 feet, and 700 feet by 100 feet. These building ways are serviced by 10 whirley cranes varying in capacity from 28 tons to 50 tons. Three floating drydocks are available that can accommodate maximum ship sizes of 600 feet by 96 feet, 530 feet by 80 feet, and 400 feet by 46 feet. Also available is 6,500 feet of wharf and pier space that is used for both repair and outfitting. Thirteen whirley cranes ranging in capacity from 17 tons to 50 tons service the wharf and pier area.

Lockheed's labor force, at 1,700, has remained substantially unchanged during the past four years.

19. National Steel and Shipbuilding Company

National Steel and Shipbuilding Company (NASSCO), jointly owned by the Morrison-Knudsen Company, Inc. and Kaiser Industries Corporation, is located on a 122.5-acre site in San Diego, California. NASSCO, the largest shipbuilding complex on the West Coast, has had experience in both Navy and commercial construction, having in the 1970's completed 17 Navy tank landing ships (LSTs), five large cargo-liners, two NASSCO-designed oil/bulk/ore carriers (OBOs), six NASSCO-designed 89,700-dwt. tankers, and five NASSCO-designed 38,300-dwt. tankers.

Since San Diego is the headquarters of the Eleventh Naval District and home port for the major portion of the Pacific Fleet, NASSCO obtains a great deal of Navy repair and overhaul work.

The following ships were under construction or on order at the yard on October 1, 1976: seven San Clemente class (89,700-dwt.) tankers, one Coronado class (38,300-dwt.) tanker, two Catalina Class (150,000-dwt.) tankers, and two San Diego class (190,000-dwt.) tankers. In addition to this backlog of commercial work, NASSCO is constructing a 37,000-ton displacement fleet replenishment oiler (AOR-7) and has on order two 641-foot destroyer tenders (AD-40 and AD-41) for delivery in 1980.

In early 1976, NASSCO completed a major facilities expansion and modernization program. In the new building dock, the shipyard can now produce ships up to 996 feet by 170 feet, compared to a previous maximum of 900 feet by 106 feet. Exhibit 8 is a general arrangement plan of the existing and new shipbuilding positions. A new outfitting pier and additional mechanized steel handling and fabricating facilities were also included in the program.

In addition to the new building dock, the yard has three inclined shipways, two of which can accommodate a maximum ship size of 900 feet by 106 feet, and one a ship size of 700 feet by 90 feet. These ways and the new building dock are serviced by 11 gantry cranes ranging in capacity from 45 tons to 175 tons. A small 2,800-ton floating drydock is available, and a large graving dock that can accommodate a maximum ship size of 687 feet LOA by 90 feet is leased on a use basis from the Unified Port District of San Diego. Ten berths with a total berthing space of approximately 6,175 feet are available for outfitting and repair. These berths are serviced by mobile and gantry cranes varying in capacity from five tons to 175 tons.

The work force at the yard increased from 5,230 in mid-1975 to 6,300 in mid-1976.

20. Todd Shipyard Corporation - San Pedro, California

Todd's Los Angeles Division is located at San Pedro, California. The facility was formerly the Los Angeles Shipbuilding and Dry Dock Company and was purchased by Todd in 1947. During the past decade, this yard constructed a series of destroyers for the U.S. Navy and has converted several commercial freighters and containerships. Beginning in 1972, Todd's San Pedro yard moved into the tanker market and in August 1975 completed a series of four "handy-size" 25,000-dwt. tankers.

In December 1976, Todd - San Pedro will complete the last of four 35,000-dwt. product tankers (MA Design T6-M-98a). The only other major commercial ship work on hand is a \$38 million conversion contract for a 23,000-dwt. anhydrous ammonia carrier. The yard has under contract three guided-missile frigates (FFG-7 class) which will provide employment through 1980.

Todd, as a result of the cancellation in 1975 of construction contracts for eight 89,700-dwt. tankers, scaled down its recent San Pedro facilities expansion program. Although the rebuilding and enlarging of its two shipbuilding ways was halted, the company completed the other aspects of the program, including a semi-automated panel line, improvement of heavy lift capabilities, outfitting and related production improvements.

The San Pedro yard presently has two conventional inclined shipways, each capable of launching a ship as large as 800 feet by 84 feet. The panel line, platens and shipways are presently serviced by one 175-ton, two 50-ton and one 25-ton gantry crane. There are two floating drydocks, one of which can accommodate a vessel 665 feet by 83 feet, and the other a vessel 563 feet by 82 feet. A total of 4,800 feet of berthing space is available at six piers for outfitting and repair. These piers are serviced by seven cranes varying in capacity from 25 tons to 50 tons.

Total employment at the yard was 2,035 at mid-1976, down from 2,460 a year earlier.

21. Todd Shipyards Corporation - Seattle, Washington

Todd's Seattle Division is located at the northwest corner of Harbor Island in Elliott Bay. The yard enjoys an outstanding reputation for building vessels for the U.S. Navy. It also does extensive barge building and ship repair work and a large volume of industrial work for the aircraft, aerospace, and hydroelectric industries. During World War II, the Seattle plant built 46 Navy destroyers and three tenders, in addition to ship repair and conversion work. In 1952, the yard embarked on new vessel construction and industrial production, completing a formidable array of tugs, barges, ferries, dredges, pile

drivers, floating cranes, etc. In 1964, the company delivered a series of four guided-missile destroyers to the Navy. In the late 1960's and early 1970's, the Seattle Division was lead yard for building 26 destroyer escorts, seven of which were built in Seattle. Currently, the yard has under contract three guided-missile frigates (FFG-7 class) two of which are for the Australian Navy. These Navy construction contracts are expected to provide work through 1980.

The largest building way at Todd - Seattle can handle a ship up to 550 feet by 96 feet. There is also a double shipway 450 feet by 131 feet. This can build two ships with beams of 50 feet or less simultaneously, or one ship of 60-foot beam or more. A small side-launch building way, maximum vessel size 220 feet by 50 feet, was added in 1974. The shipyard has three floating drydocks capable of accommodating vessels 650 feet by 83 feet, 550 feet by 88 feet, and 420 feet by 62 feet. Two wharves and four piers, served by eight whirley cranes with a 50-ton maximum capacity, provide a total of about 4,850 feet of berthing space for outfitting and repair.

Total employment at the Seattle plant was down to about 400 in September 1976, compared to 1,200 a year earlier. When the FFG program reaches full production, the payroll is expected to increase to between 1,500 and 2,000.

22. American Ship Building Company - Lorain, Ohio

Since it was founded in 1899 in Lorain, Ohio, the American Ship Building Company has been a leader in the design and construction of ships for the Great Lakes. Under its present organization, the company's AMSHIP Division consists of three yards, in Lorain and Toledo, Ohio, and Chicago, Illinois. The TAMPA Division consists of only Tampa Ship Repair & Dry Dock Co., Inc., and the NABRICO Division consists of only Nashville Bridge Company. These are the divisions involved in shipbuilding.

During the World War II period, the company built an impressive variety of vessels for the Navy, Army, Maritime Commission, and private interests. Since World War II, American Ship has continued its leadership in the shipbuilding industry on the Great Lakes, specializing in the construction of ore carriers, besides building seven Coast Guard cutters, two naval auxiliaries and a fisheries research vessel.

In 1971, the company completed an extensive modernization and improvement program at its Lorain shipyard, including new computer control programs and management information systems. The Lorain yard, which covers 48 acres, is one of two shipyards on the Great Lakes capable of building ships up to 1,000 feet in length. Management is moving ahead with plans to develop the Lorain plant as the major source for new construction work with the company's Toledo and Chicago yards supplying various components. Repair and conversion work is also an important source of revenue for the Lorain facility.

In August 1976, Lorain completed the JAMES R. BARKER, a 1,000-foot self-unloading Great Lakes ore carrier. The yard currently has under construction three more ore carriers of the same size, one for Pickands Mather, one for National Steel Corporation, and one for U.S. Steel Corporation.

In the Lorain facility, one side-launching way is available for construction of vessels up to 700 feet by 75 feet. The large graving dock (maximum ship size 1,021 feet by 121 feet) is used for new construction. The yard's other graving dock, which can handle ships up to 705 feet by 78 feet, is being used for drydock work. A total of about 1,800 feet of berthing space is available for repair and outfitting.

The total payroll at Lorain averaged approximately 800 during 1976.

23. American Ship Building Company - Toledo, Ohio

In 1947, The American Ship Building Company purchased this shipyard from the Toledo Shipbuilding Company. Like the Lorain yard, the Toledo plant is now a complete, modern full-service shipyard, equipped for new construction, conversion, repairs, and general heavy fabrication and machine work.

In addition to repair, overhaul and conversion work, Toledo in the 1960's and 1970's built the following vessels: an oceanographic survey ship, a naval patrol escort, a Coast Guard cutter, and three Great Lakes ore carriers, the last of which was the 26,000-dwt. ROGER M. KYES, delivered in 1973.

Repair and overhaul work on Great Lakes vessels during the winter lay-up is an important source of business. Besides repair and overhaul, the Toledo plant is currently fabricating the 560-foot by 77-foot midbody sections for the 1,000-foot ore carriers under construction at Lorain.

The AMSHIP Division's Toledo yard utilizes the headquarters engineering staff located at Lorain for all work requiring a technical staff.

Like the Lorain yard, the Toledo facility has two graving docks. One is capable of accommodating a vessel 634 feet by 78 feet, the other a vessel 529 feet by 68 feet. There is about 1,600 feet of berthing space available.

Total employment averages about 350 the year around.

24. Bay Shipbuilding Corporation

Bay Shipbuilding Corporation, located in Sturgeon Bay, Wisconsin, is a subsidiary of The Manitowoc Company, Inc. As a result of Manitowoc's purchase of Sturgeon Bay Shipbuilding and Dry Dock Company in 1968 and the adjoining Christy Corporation property in 1970, Bay Ship-

building now has 31 acres of waterfront property. The new combined facilities at Sturgeon Bay have channel access from both Lake Michigan and Green Bay and provide ample dock space for Great Lakes vessel repair and new construction.

Six self-unloading Great Lakes ore carriers are on order or in production at the yard, including five 1,000-footers. These contracts will provide employment well into 1980.

Bay Shipbuilding is completing the final phase of a major facilities expansion program that has enabled the company to build 1,000-foot Great Lakes bulk carriers. The new graving dock, which is designed to be used as both a building basin and a repair dock, can accommodate a vessel as large as 1,146 feet by 136 feet and is the largest such dock on the Lakes. It will be served by a 100-ton gantry crane and several crawler-type lift cranes. The steel erection capacity for ships to be built in the basin is estimated to be 12,000 to 15,000 tons per year. Also included in Bay Shipbuilding's expansion program is a \$2 million plate fabrication and burning shop, completed in 1975. The entire program is scheduled for completion in December 1976.

Bay has three side-launching ways that can accommodate maximum ship sizes of 750 feet by 105 feet, 600 feet by 80 feet, and 400 feet by 70 feet. One floating drydock is available which can handle ships up to 650 feet by 66 feet. There is 7,090 feet of berthing space for repair and outfitting.

The total employment is 1,200, a slight increase over last year.

25. Defoe Shipbuilding Company

The Defoe shipyard, established 1905, is located on the Saginaw River in Bay City, Michigan. This yard is experienced in the construction of ships, boats, barges, and many types of water craft. During World War II, Defoe constructed commercial ships for service on the Lakes, as well as vessels for the U.S. Coast Guard. In the 1950's and 1960's, Defoe built several Great Lakes bulk carriers, destroyer escorts and guided-missile destroyers for the Navy, and two oceanographic research vessels. Since 1970, the yard has specialized in conversion and repair work, although it has shipbuilding capability.

Currently, the company has no new ship construction or major conversion work under contract, but repair work is expected to increase during the winter lay-up of Great Lakes boats.

The Defoe plant has two large side-launching ways for ship construction, one of which can accommodate a ship 900 feet by 92 feet, and the other a ship 600 feet by 60 feet. Berthing space for repair and outfitting totals 2,756 feet. There are no drydocking facilities. When necessary, Defoe has used AMSHIP's drydocks at Lorain and Toledo, Ohio.

The work force at Defoe averaged around 200 in the summer of 1976.

26. Fraser Shipyards, Inc.

The Fraser shipyard, located on Howards Bay in Superior, Wisconsin, was founded in 1890 as the American Steel Barge Company. Since then the plant has had a succession of owners. At one time during World War II, the yard employed 20,000 people in shipbuilding, but since the war it has been principally a ship conversion and repair facility. Fraser has the experience and capability to build large ships. From 1973 to early 1976, the yard jumboized ten Great Lakes bulk freighters in addition to self-unloader conversion work.

In the summer of 1976, the only work on hand at Fraser was short-term ship repair and minor conversion work. During the winter lay-up of Great Lakes boats, repair work is expected to double.

The yard has two graving docks suitable for ship construction, repair or conversion work. One basin can accommodate a vessel 825 feet by 76 feet, and the other a vessel 621 feet by 56 feet. A small graving-type drydock, 131 feet by 80 feet, was added in 1973 to build new midbody sections for the bulk ore freighters under contract for lengthening at the Fraser plant. There is 4,450 feet of berthing space, in addition to pier space available on the site of the dismantled building slips which are no longer used for ship construction.

Fraser's work force averaged about 150 in the summer of 1976, down from 450 in mid-1975.

Manpower

As indicated in Exhibit 13, there were approximately 229,200 employees engaged in the shipbuilding and ship repair industry, including Navy shipyards, as of April 1976. This is an increase over 1975 of about 10,300 workers. Employment in the 25 major U.S. commercial shipyards rose to 96,200, or about 58 percent of the work force in all commercial yards, which totaled 165,600.

Manpower requirements for skilled shipbuilding occupations are expected to remain constant on an aggregate national level at least until 1980. 1/

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1/ According to a summation of shipyards' manpower demands derived from the Shipyard Production and Mobilization Model (SPAMM), which was created by the Division of Production to analyze the production capabilities of the U.S. shipbuilding industry.



The steady manpower demand is predicated on a continuing shipbuilding program by the Navy and the Maritime Administration; however, many major shipyards will be forced to lay off substantial numbers of skilled craftsmen unless new contracts are acquired in the near future. Experience has indicated that a large number of these men would be lost to the shipbuilding industry forever, thus reducing the capability of the industry to respond quickly and effectively to a commercial or mobilization requirement.

Throughout the Gulf Coast and certain Atlantic Coast areas, there continues to be a skills shortage most persistently in shipyard-qualified welders. Other skills also in short supply include shipfitters, pipefitters, and inside and outside machinists.

### Material Shortages

According to the Navy Shipbuilding Scheduling Office, most of the lead times for basic materials and ship components increased during the first half of 1976 due to rising aggregate consumer demand. Earlier ordering of ship components has been necessary to ensure timely deliveries. Lead times for castings and forgings have continued to decrease.

MarAd is continuing to request D0-A3 priority ratings for both Title V Construction-Differential Subsidy (CDS) ships and Title XI-Ship Financing Guarantee vessels. The priority rating system, under the Defense Priority System and the Defense Materials System, continues to be an integral part of our national defense-related ship construction program, given the unpredictable nature of material and component procurement in the shipbuilding industry.

### Shipyard Pollution-Abatement Requirements

The shipbuilding industry has made a commitment, both in terms of manpower and funding, to upgrade its new construction shipyards, and ship repair and drydocking facilities to comply with Federal, state and local pollution-abatement regulations.

The pollutants associated with shipyard activities are those which primarily affect air, water and noise pollution. Shipyards throughout the United States have undertaken major programs to eliminate or control these pollutants. For example, air pollution has been reduced substantially by the use of closed cycle blast and paint facilities. Booms and pollution-control craft are utilized to control accidental spillage of liquid and solid pollutants. The deleterious effects of noise pollution have been minimized by the use of silencers and mufflers, as well as utilization of hearing protection such as ear plugs.

With the implementation of the Federal Water Pollution Control Act, as amended, the Clean Air Act, and the Occupational Safety and Health Act, shipyards have developed programs designed to improve the environmental quality of the shipyards and those geographical areas that are directly affected by the shipyard activities. Shipyards, as well as any industry

whose activities result in a polluting discharge, are required under the Federal Water Pollution Control Act to obtain National Pollutant Discharge Elimination Standards (NPDES) permits. To obtain these permits, definitive programs must be established to control polluting discharges. Many state and local governments have followed the lead of the Federal Government in this regard by establishing similar air and water pollution permit and control programs. Shipyards must also comply with these state and local programs, where required.

In an effort to bring together the technological advances made by various shipyards in pollution control, the Society of Naval Architects and Marine Engineers (SNAME) established a technical Panel SP-3, Shipyard Environmental Effects. This panel meets regularly to discuss shipyard environmental problems and to exchange information on the state of the art of pollution abatement. In addition, guest speakers or personnel with a particular environmental expertise are invited to these meetings. Also, to develop a better understanding of the environmental standards to which shipyards must conform and to determine the method by which each shipyard implements its pollution-abatement programs, the SNAME SP-3 Panel has developed a questionnaire which will be sent to all major shipyards for response. This questionnaire will assist the SP-3 Panel in focusing on those troublesome areas which will require further attention by the shipbuilding industry.

#### Ship Repair Facilities

The ship repair industry is a composite of many organizations of varying capabilities. The smaller of these organizations, usually referred to as "top-side" yards, do not have drydocks, employ a limited number of people, sometimes less than 100, and specialize in work that can be accomplished without extensive shop facilities. The large organizations have drydocks and can repair or rebuild any part of a ship. Employment in the major shipyards usually numbers in the thousands, and repair, overhaul and conversion may be combined with shipbuilding capabilities. Presently, the Maritime Administration holds master repair contracts with 73 ship repair facilities. Thirty-six are located on the East Coast, 17 along the Gulf Coast, 19 on the West Coast and one on the Great Lakes.

Because of the drop-off in opportunities for merchant ship new construction contracts, a number of large yards are seeking to increase their ship repair business. In some instances, profits on repair work offset ship construction losses. Ship repair yards over the last few years have actively been soliciting business from other industries that use steel fabrication and pipe work, such as petrochemicals, with varying success. The advent of larger ships has affected the ability of some yards with smaller drydocks to maintain their old clients. In general, the ship repair yard often commands excellent prices for urgently needed repairs and can control its overhead more closely. Ship repairing is considered within the industry as generally more profitable than ship construction.

Lack of requirements and capabilities for Ultra-Large Crude Carriers (ULCCs) to operate in the ports of the United States has been one factor that has not forced construction in the U.S. of completely new ship repair facilities with huge drydock capabilities such as those available in foreign yards.

There has been, however, an increase in new drydocks acquired by the private ship repair yards over the past several years, geared to many of the larger types of ships now operating, even if not capable of handling many of the world's larger VLCC/ULCC ships. Such drydocks include those at Sun Shipbuilding & Dry Dock Company, Avondale Shipyards, Maryland Shipbuilding & Drydock Company, Jacksonville Shipyards, Ingalls Shipbuilding Division/Litton Industries, Bethlehem Steel Corporation (San Francisco and Hoboken Yards), and Todd Shipyards Corporation (San Francisco Division).

For ships 300 feet in length and above, the U.S. shipbuilding and repair industry has a total of 74 floating drydocks, 48 graving docks, and five marine railways. Of course, several of these graving docks are committed to new construction.

Despite the fact that U.S. repair yards are now competitive with foreign facilities, earnings increases have not been significant. In the opinion of the Shipbuilders Council of America, ship repairing overall through 1980 will apparently be more stable than shipbuilding. As shown in Exhibit 14, the dollar volume of repair and conversion work in private yards is expected to increase in 1977, especially with respect to work on naval ships. Because of the large size and the complexity of Navy combatant ships, participation in this increased Navy workload will be restricted to a limited number of private yards - only those with the physical plant capability to perform a complete regular overhaul on ships the size of an ammunition ship or larger, and those yards with the specialized trades necessary to do this work.

#### Major Drydocking Facilities

Major drydocking facilities are defined as those yards engaging primarily in repair or reconstruction and having at least one drydock that can accommodate vessels 300 feet in length or over. These yards do not usually engage in new construction of large oceangoing vessels, although the capability usually does exist if the situation demands it.

Appendix B tabulates information updated through 1976 on 40 of these yards on a coastal basis. Additional data is available in the Office of Ship Construction.

#### Major Topside Repair Facilities

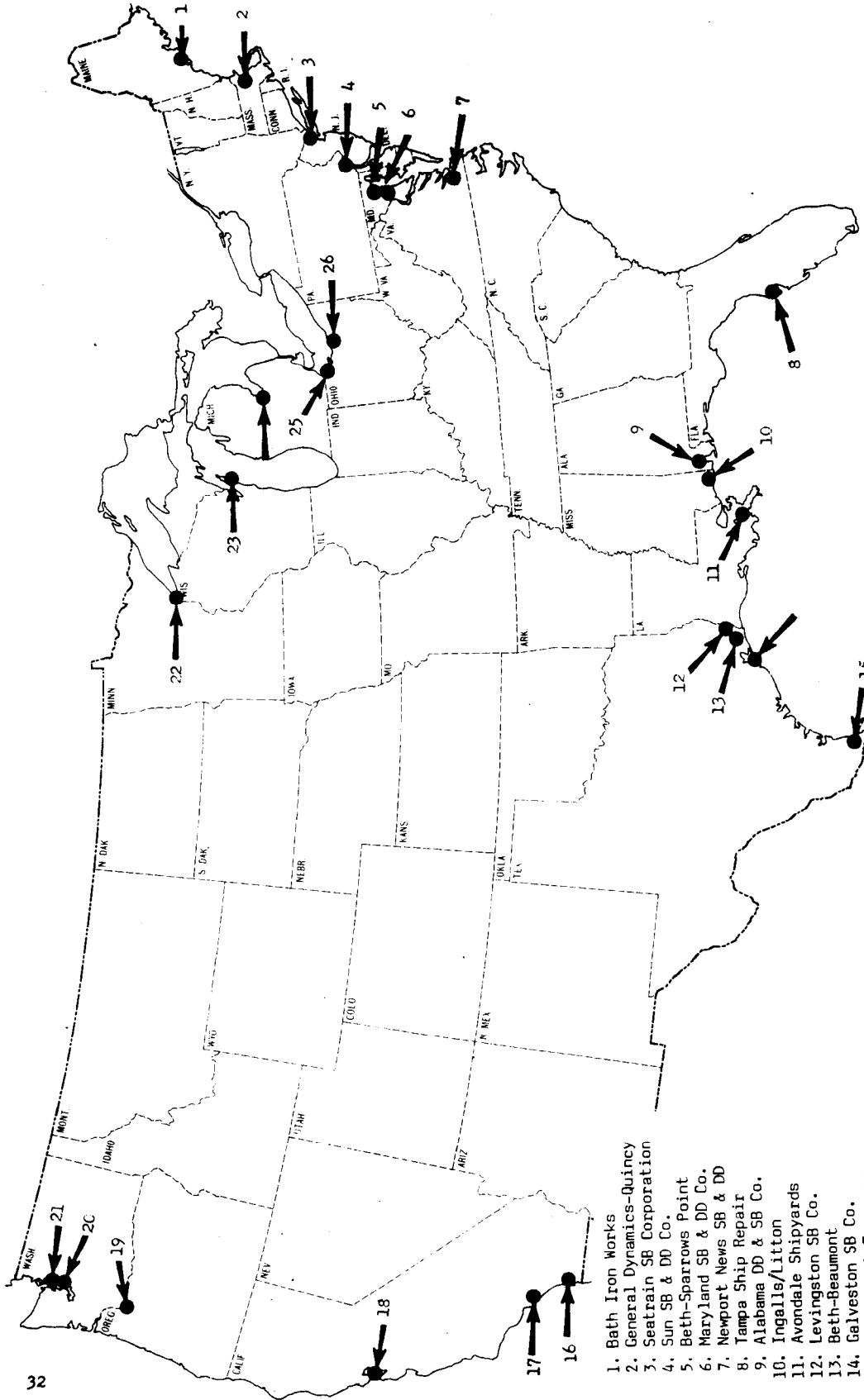
Major topside repair facilities are those that have the capability to provide repair service to oceangoing ships when the work can be accomplished without taking the ships out of the water. The "topside" yards continue to get their share of large ship business. These facili-

ties usually lease pier space on a job basis and do not have any type of drydocking installations. Services rendered by these firms vary from a simple repair job to a major topside overhaul. It is common practice for a shop to send its personnel and equipment to provide voyage repairs while the ship is at anchor or working cargo at a commercial marine terminal. There is an increasing trend worldwide to send ship repairers to the ship rather than to bring the ship to the shipyard, thus calling for greater mobility of ship repair personnel. This is particularly applicable to highly skilled technicians as against the hull trades. Several yards which normally build and repair only smaller vessels and barges are also capable of performing topside repair work on oceangoing ships.

Appendix C is a list of 100 major topside repair facilities, 45 of which are located on the East Coast. No attempt has been made to tabulate their machinery and equipment due to the variance of the type of work an individual firm will engage in. Detailed data for most of the facilities has been obtained during the MarAd annual survey and is available in the Office of Ship Construction.

# SHIPBUILDING INDUSTRY IN THE UNITED STATES

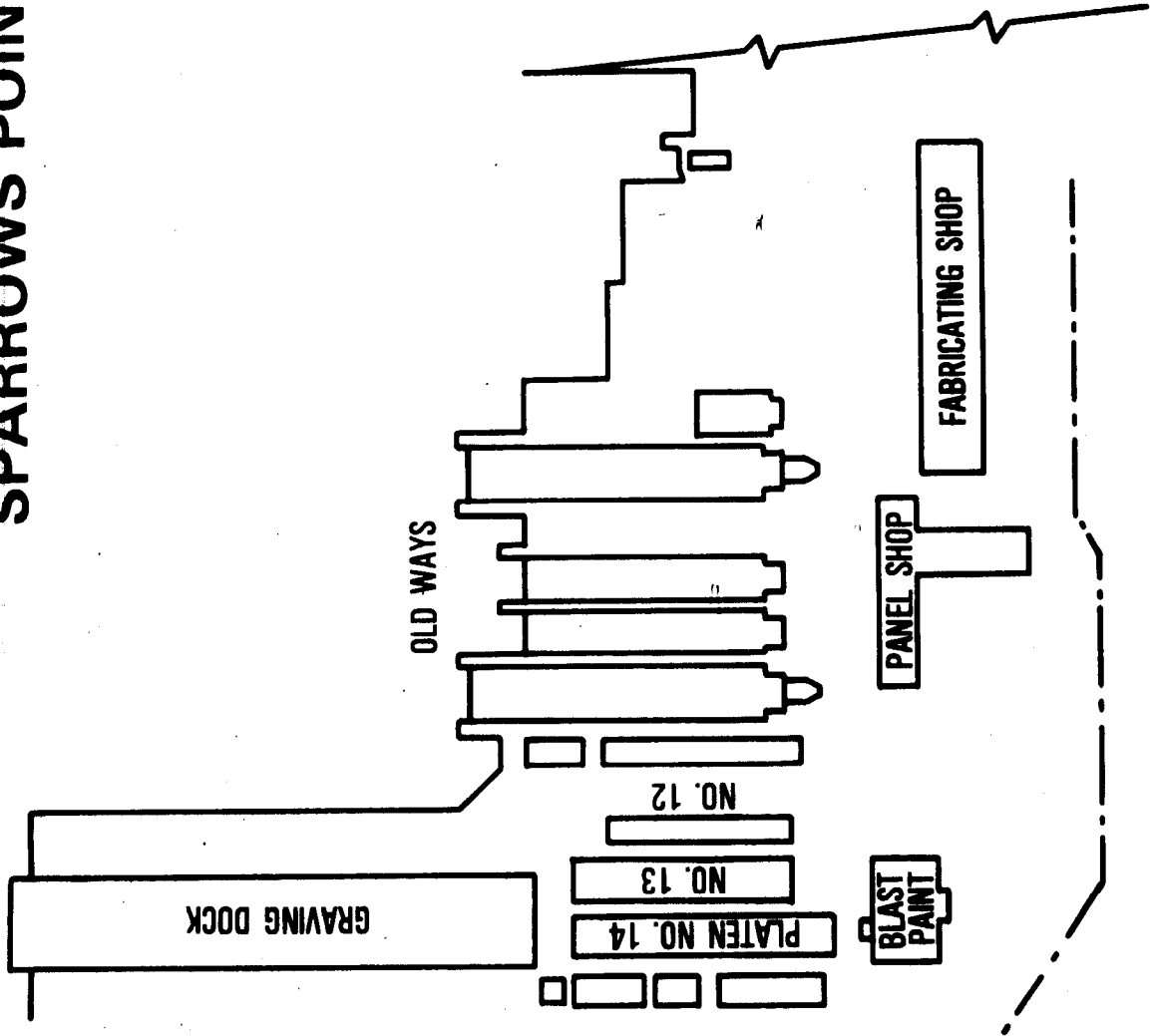
EXHIBIT 1



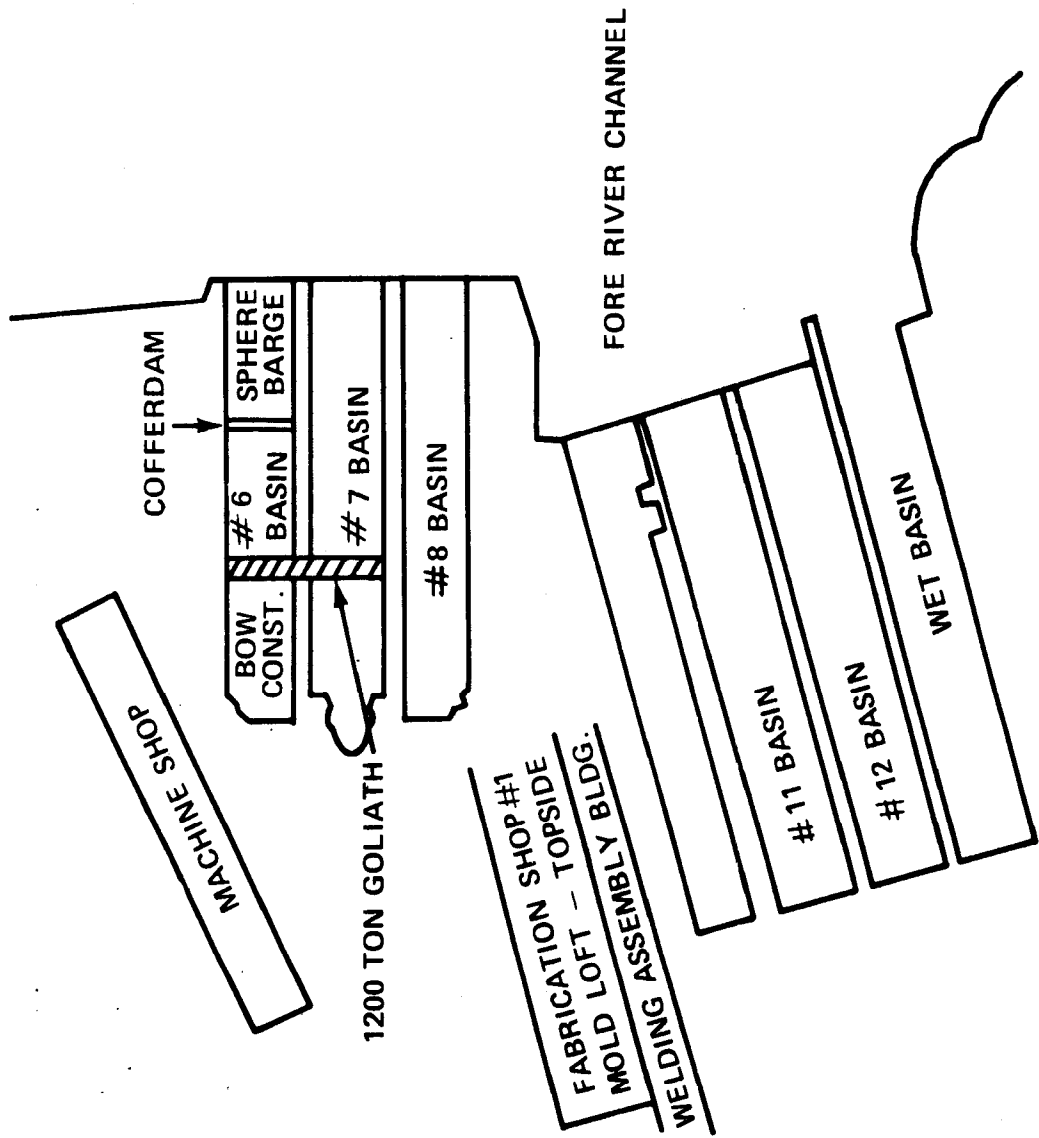
1. Bath Iron Works
2. General Dynamics-Quincy
3. Seatrain SB Corporation
4. Sun SB & DD Co.
5. Beth-Sparrows Point
6. Maryland SB & DD Co.
7. Newport News SB & DD
8. Tampa Ship Repair
9. Alabama DD & SB Co.
10. Ingalls/Litton
11. Avondale Shipyards
12. Levinston SB Co.
13. Beth-Beaumont
14. Galveston SB Co.
15. Marathon LeTourneau
16. NASSCO
17. Todd-San Pedro
18. Beth-San Francisco
19. FMC Corporation
20. Lockheed SB
21. Todd-Seattle
22. Fraser Shipyards
23. Bay SB Corporation
24. Defoe SB Co.
25. American SB Co., Lorain
26. American SB Co., Toledo

MAJOR AMERICAN SHIPYARDS  
BUILDING CAPACITY - SHIPS 475 FEET IN LENGTH OR OVER

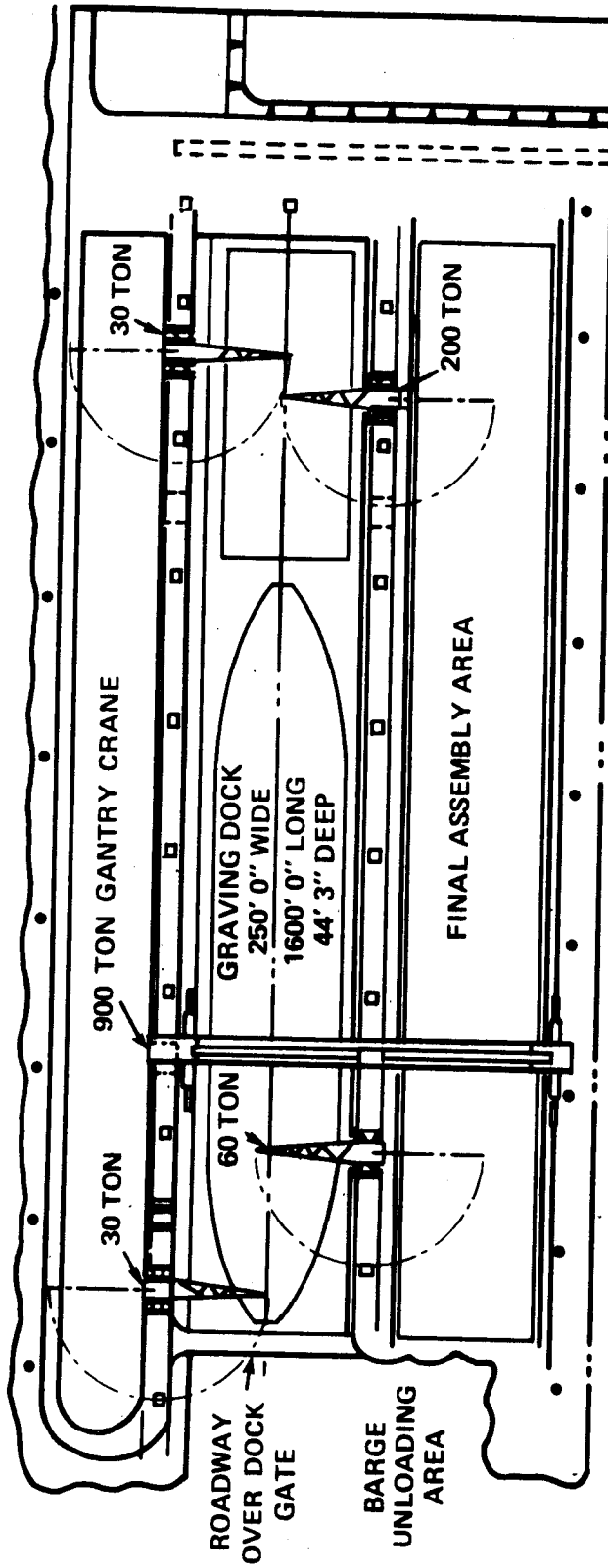
# BETHLEHEM STEEL CORPORATION SPARROWS POINT YARD



# GENERAL DYNAMICS — QUINCY

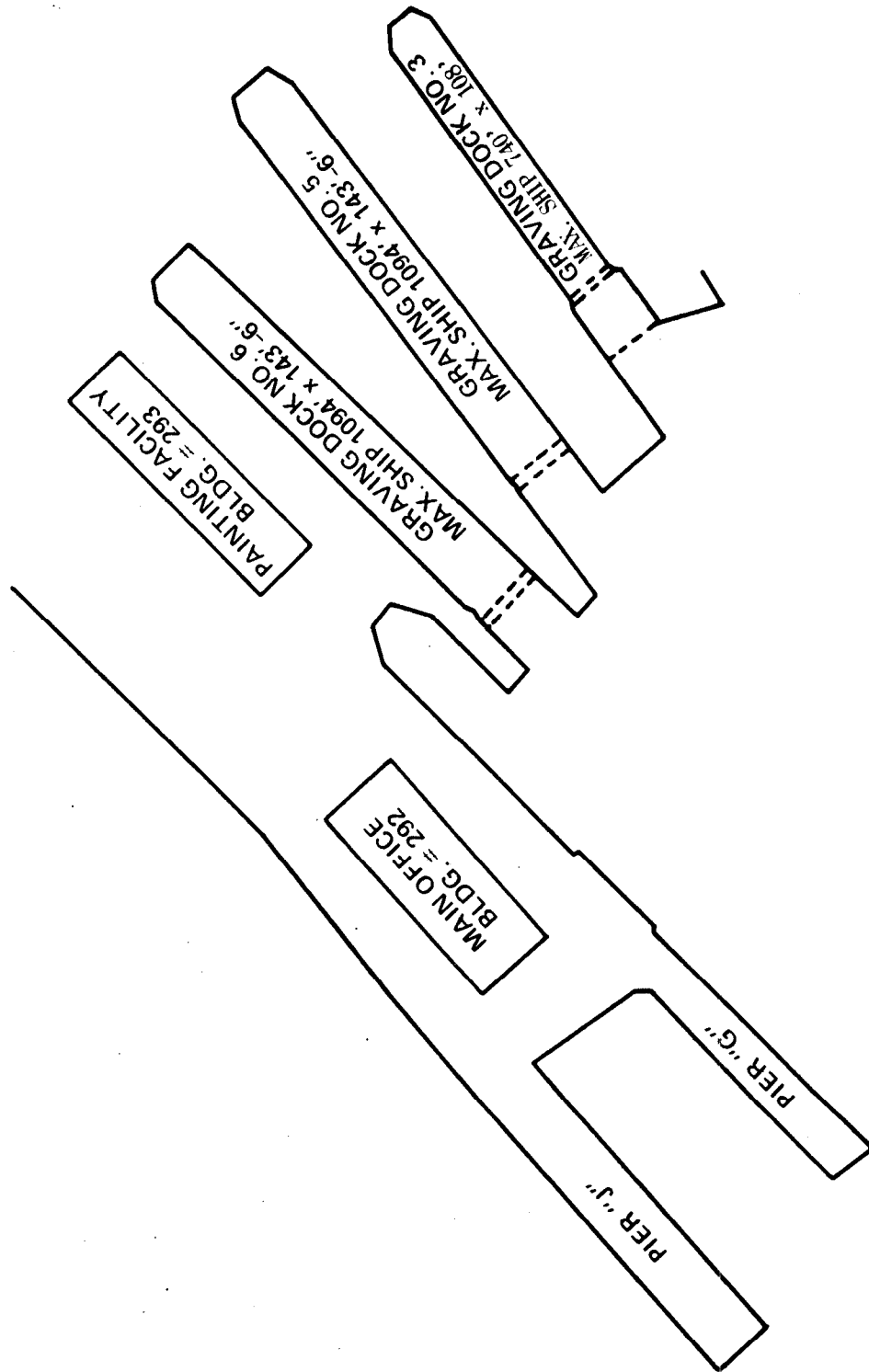


# NEWPORT NEWS



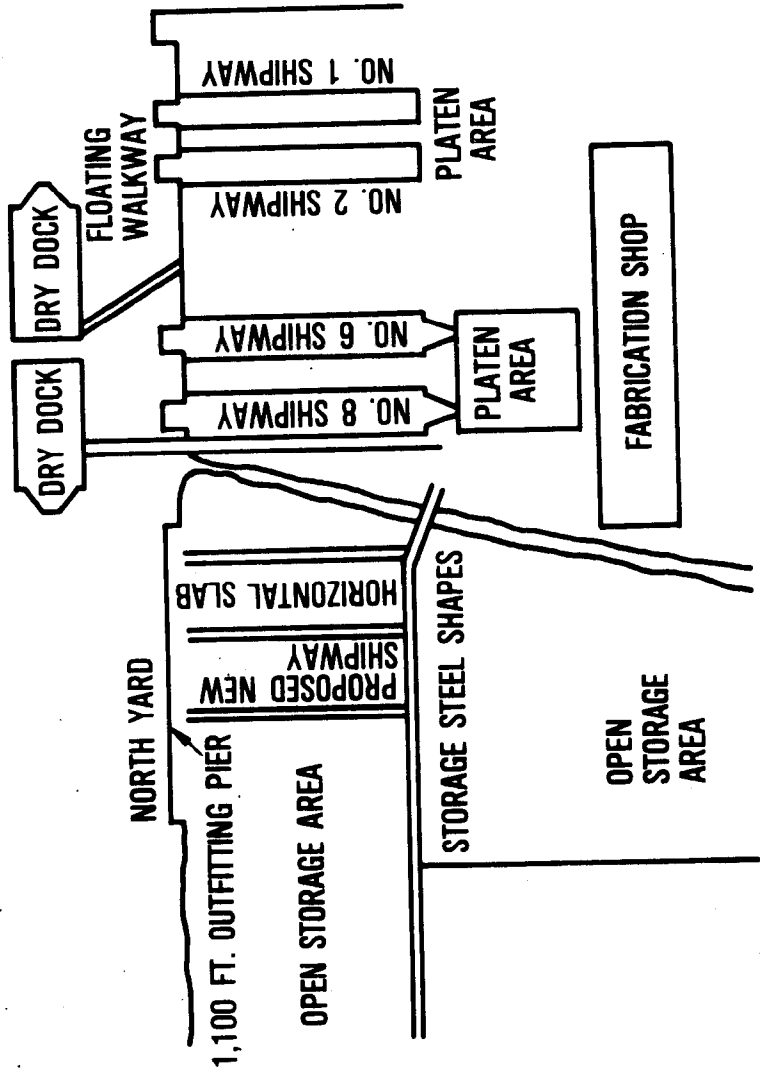


# SEATRAN SHIPBUILDING CORP.

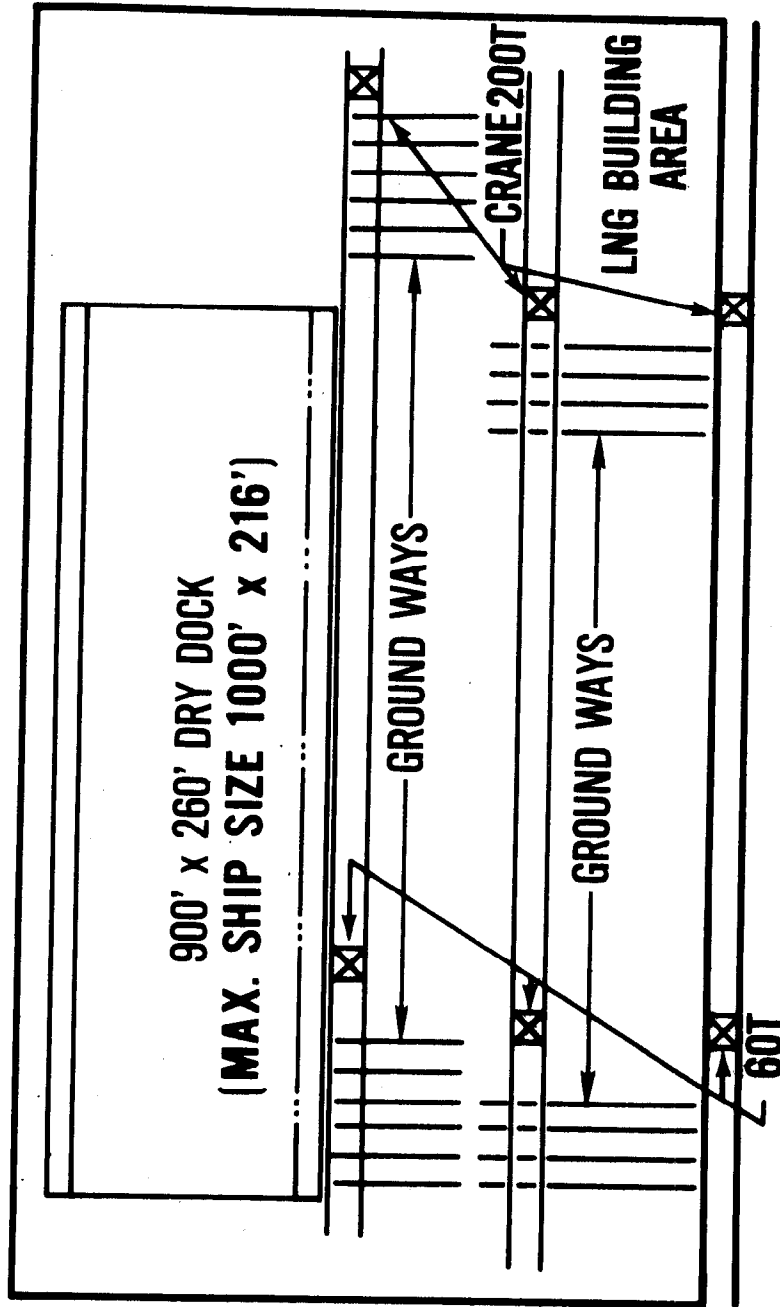


# SUN SHIPBUILDING & DRYDOCK CO.

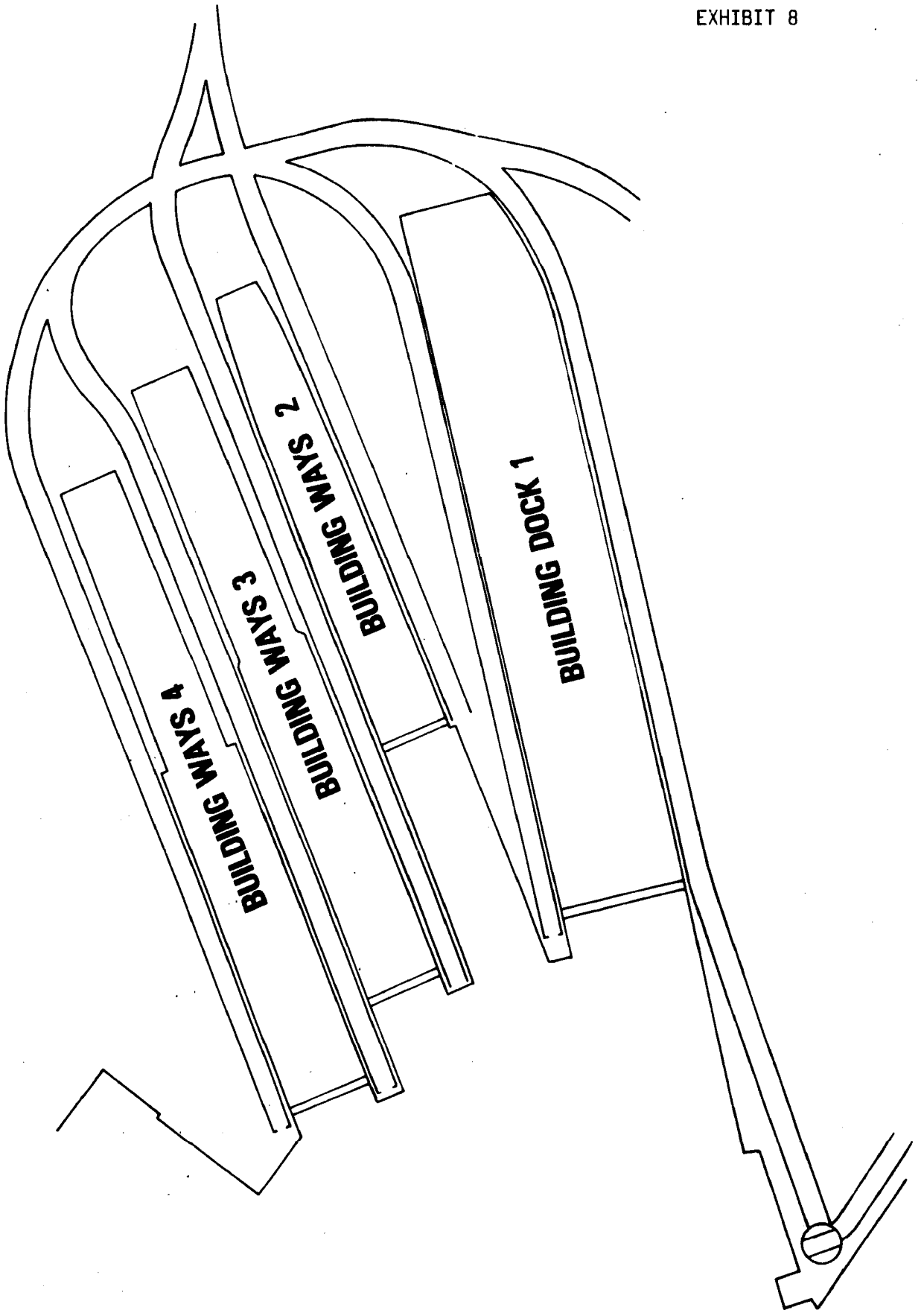
EXHIBIT 6



# AVONDALE SHIPYARDS, INC.

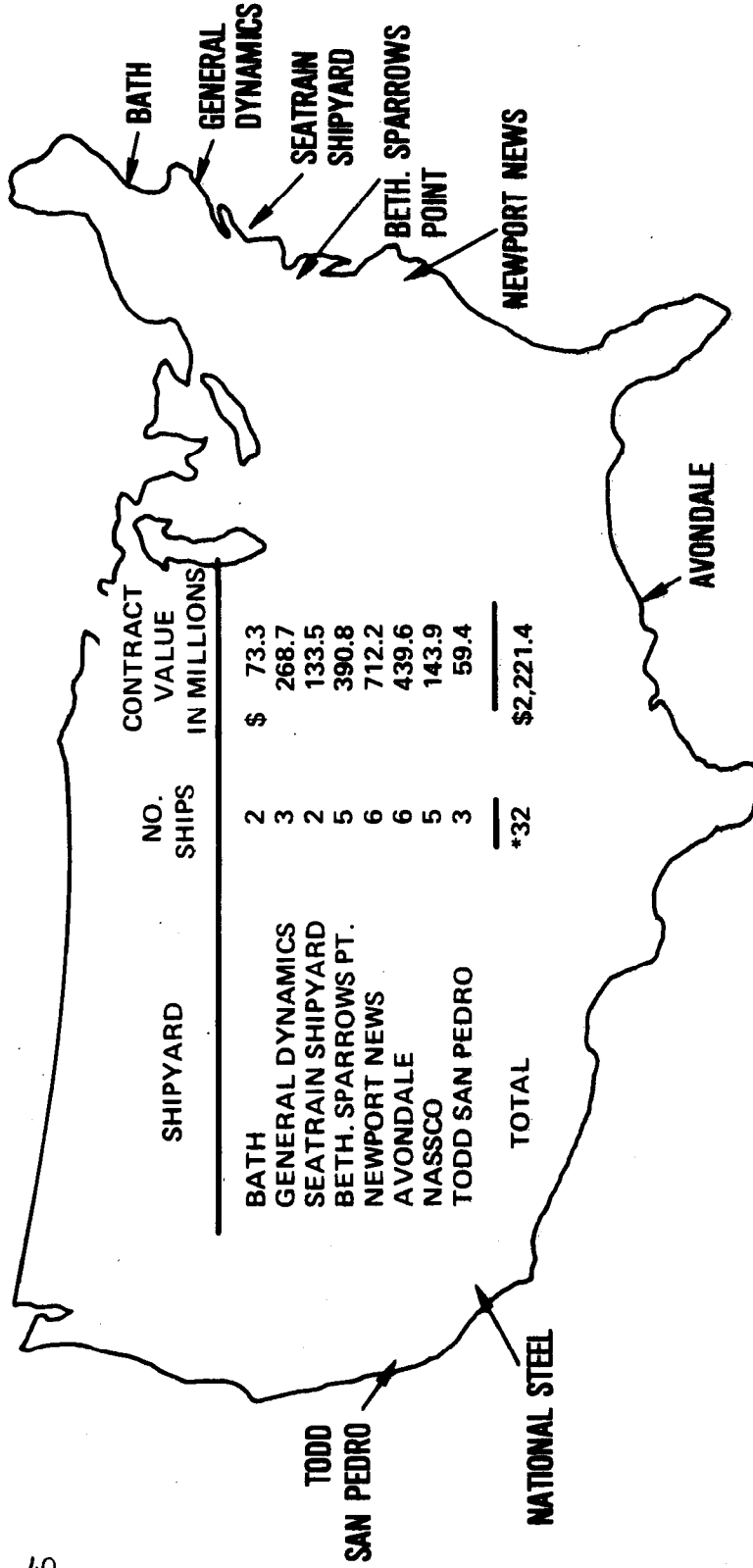


# NASSCO



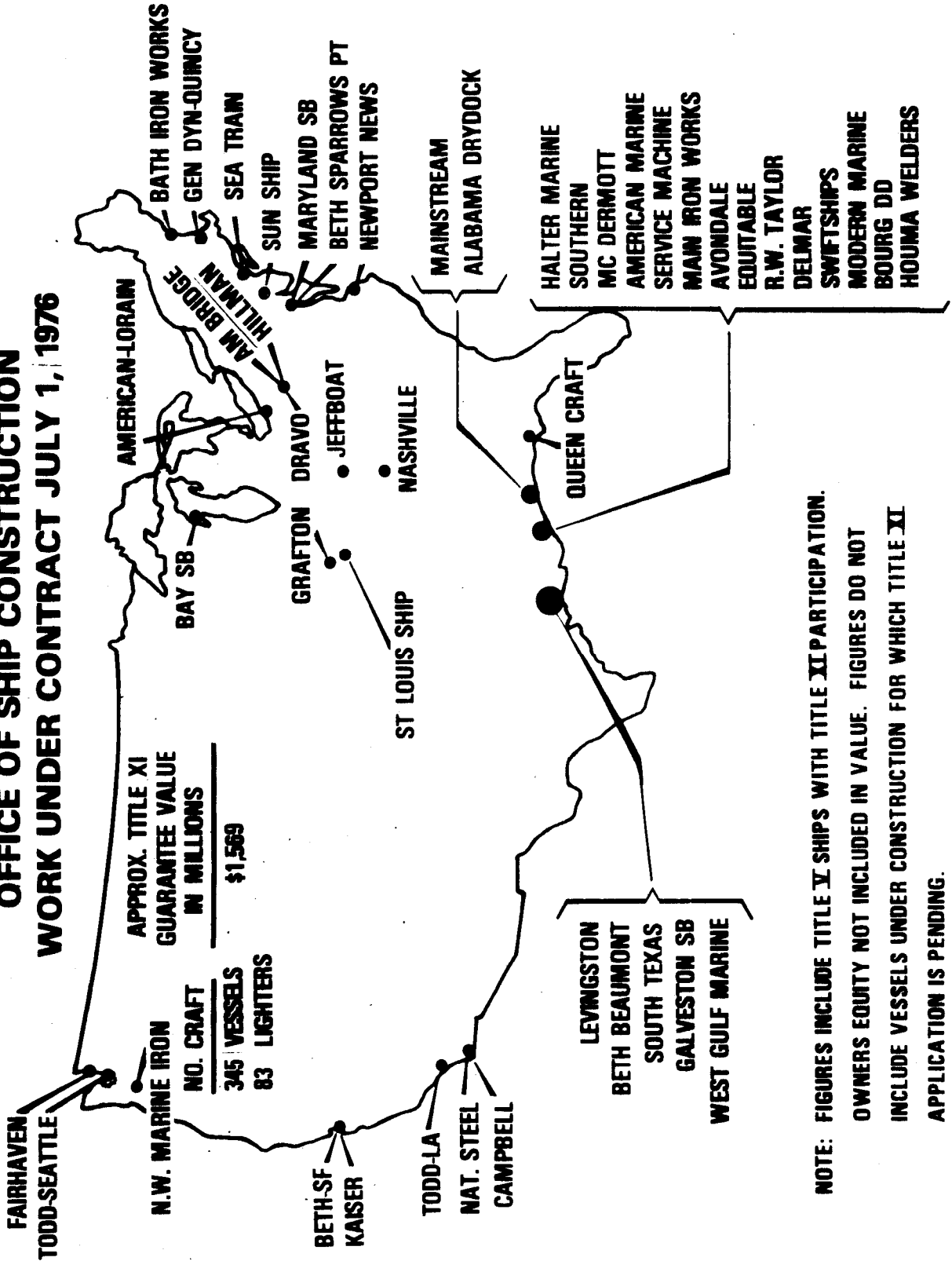
# SHIPBUILDING PROGRAM (TITLE V) OFFICE OF SHIP CONSTRUCTION

SHIPS UNDER CONTRACT JULY 1, 1976  
TOTAL CONTRACT VALUE, UNDELIVERED SHIPS



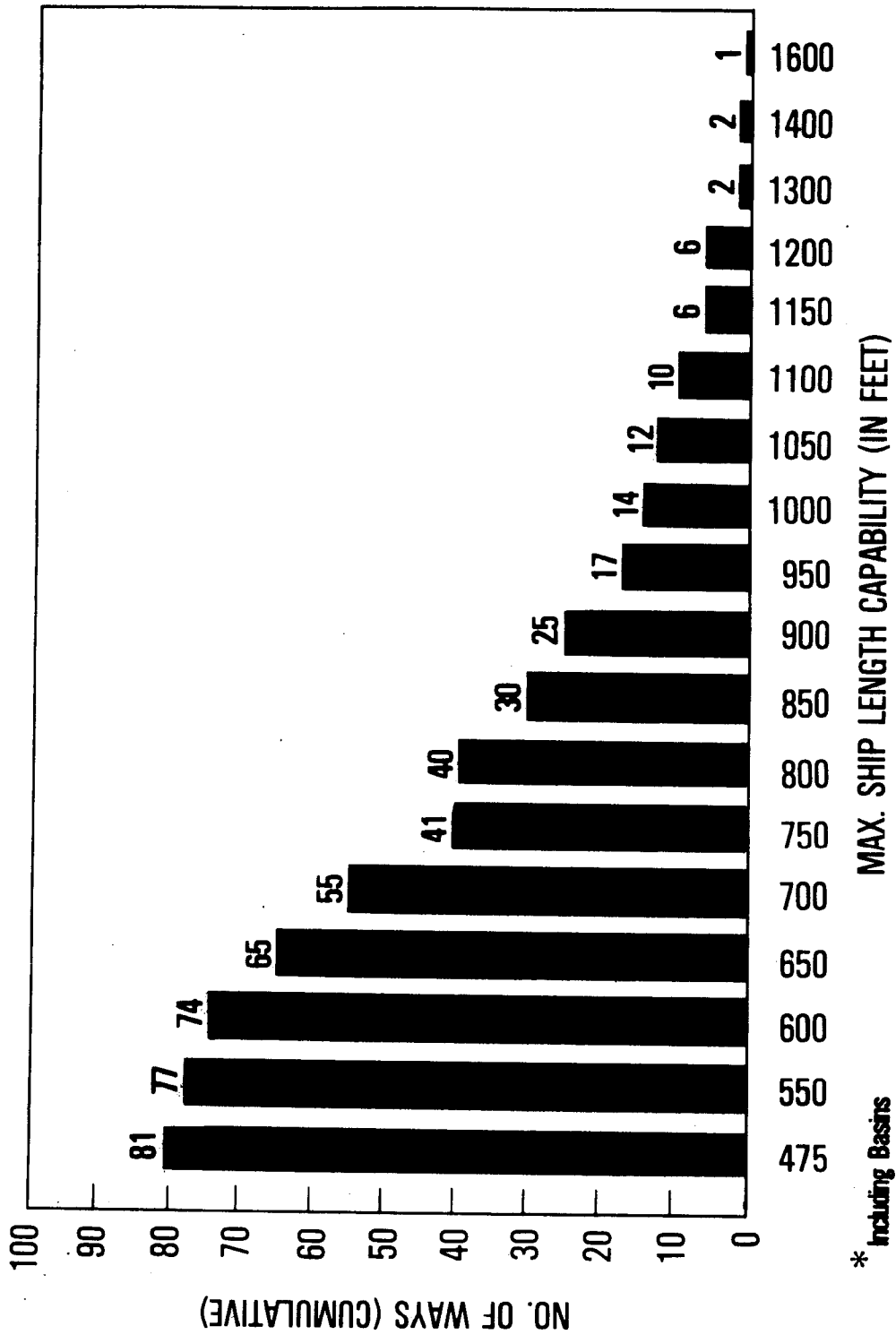
\*IN ADDITION TO 32 NEW SHIPS, TWO MAJOR TITLE V CONVERSIONS, WITH A CONTRACT VALUE OF \$40.3 MILLION, ARE ALSO ON ORDER.

**SHIP FINANCING GUARANTEE CONSTRUCTION PROGRAM (TITLE XI)  
OFFICE OF SHIP CONSTRUCTION  
WORK UNDER CONTRACT JULY 1, 1976**



**NOTE: FIGURES INCLUDE TITLE XI SHIPS WITH TITLE XI PARTICIPATION. OWNERS EQUITY NOT INCLUDED IN VALUE. FIGURES DO NOT INCLUDE VESSELS UNDER CONSTRUCTION FOR WHICH TITLE XI APPLICATION IS PENDING.**

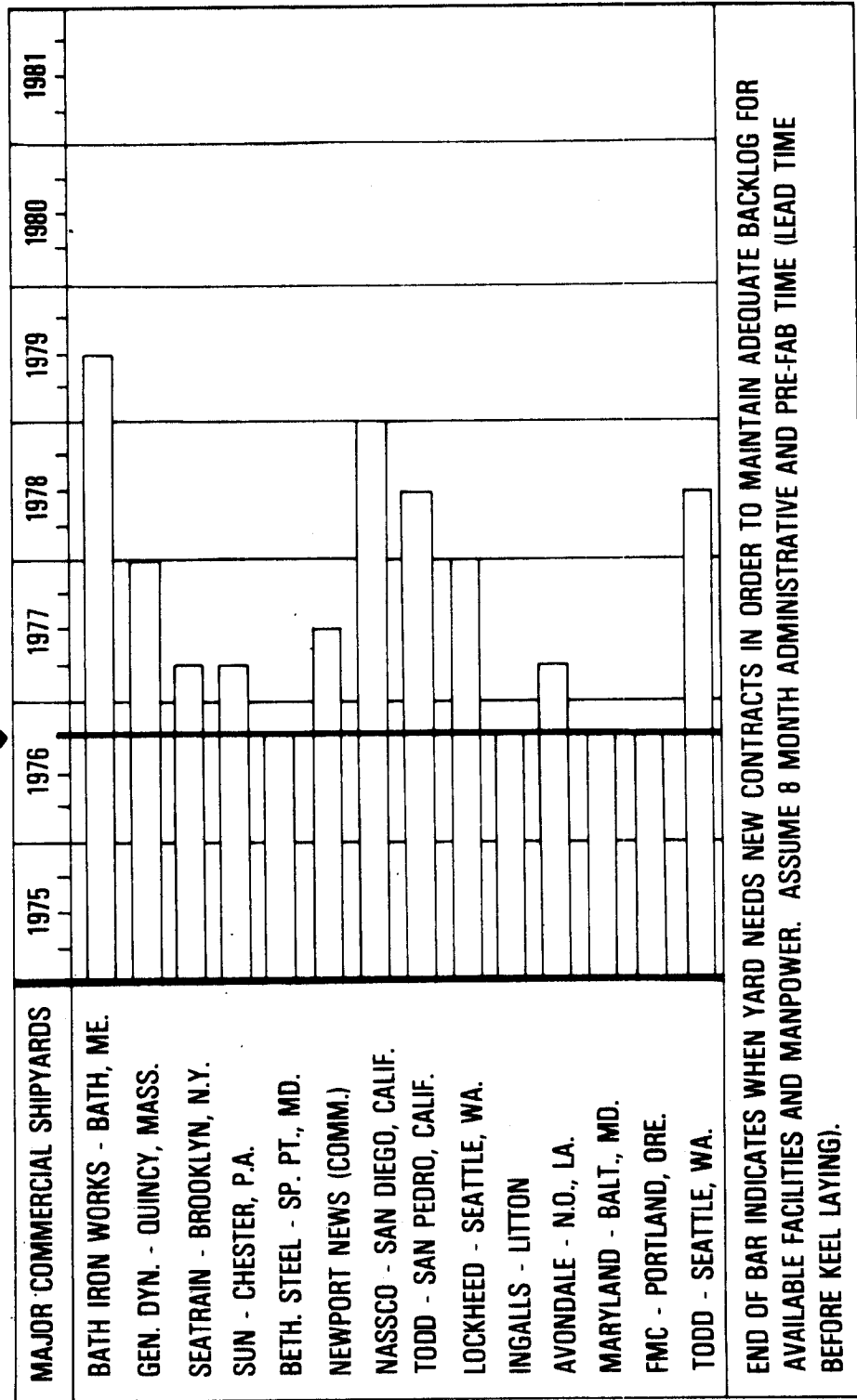
**MAJOR U.S. PRIVATE SHIPYARDS**  
**\* NUMBER OF SHIPWAYS BY MAXIMUM LENGTH CAPABILITY**  
**(November 1, 1976)**



# SHIPYARD STATUS: NEED FOR NEW BUSINESS

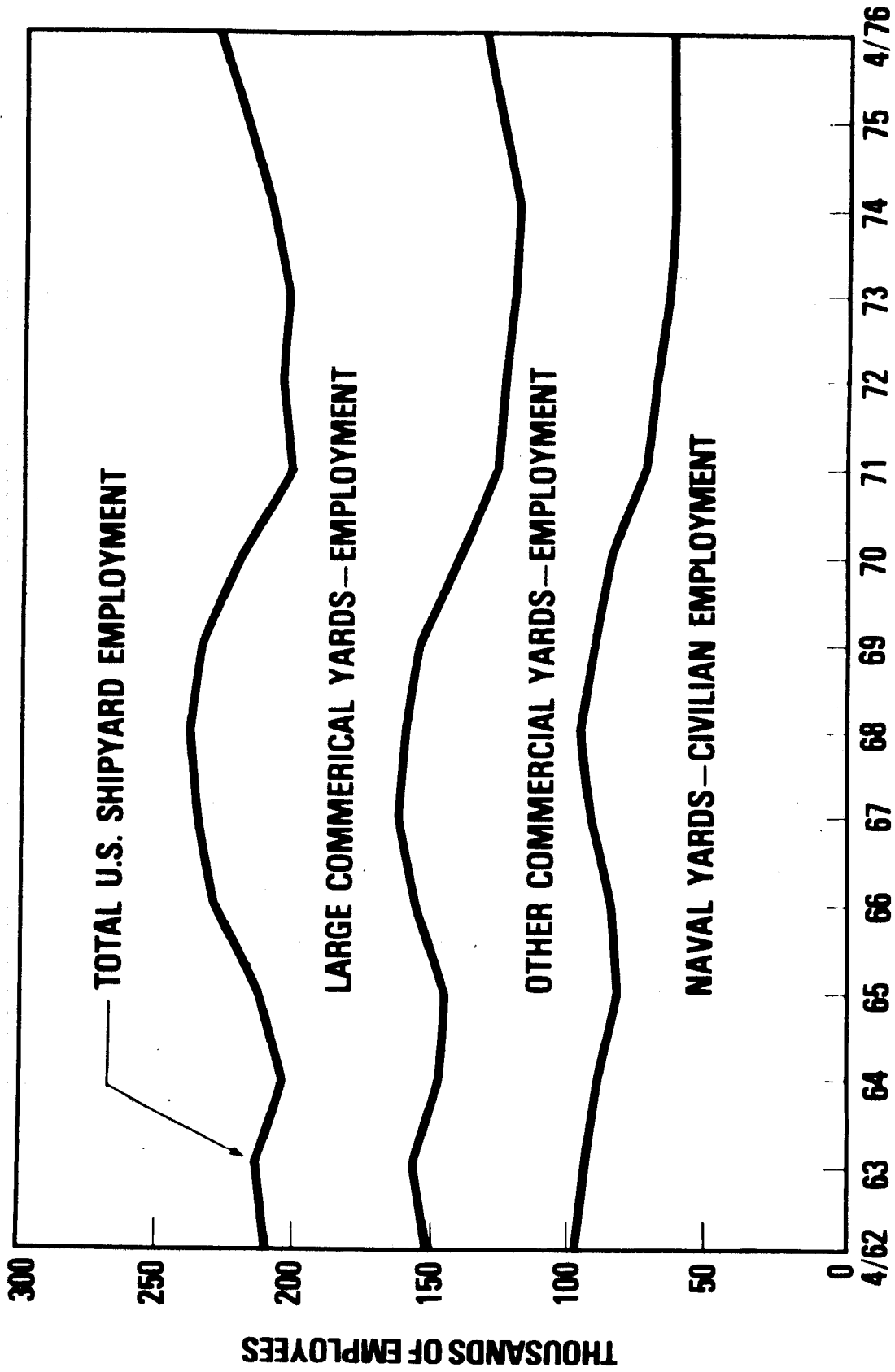
U.S. DEPARTMENT OF COMMERCE  
MARITIME ADMINISTRATION

TIME NOW

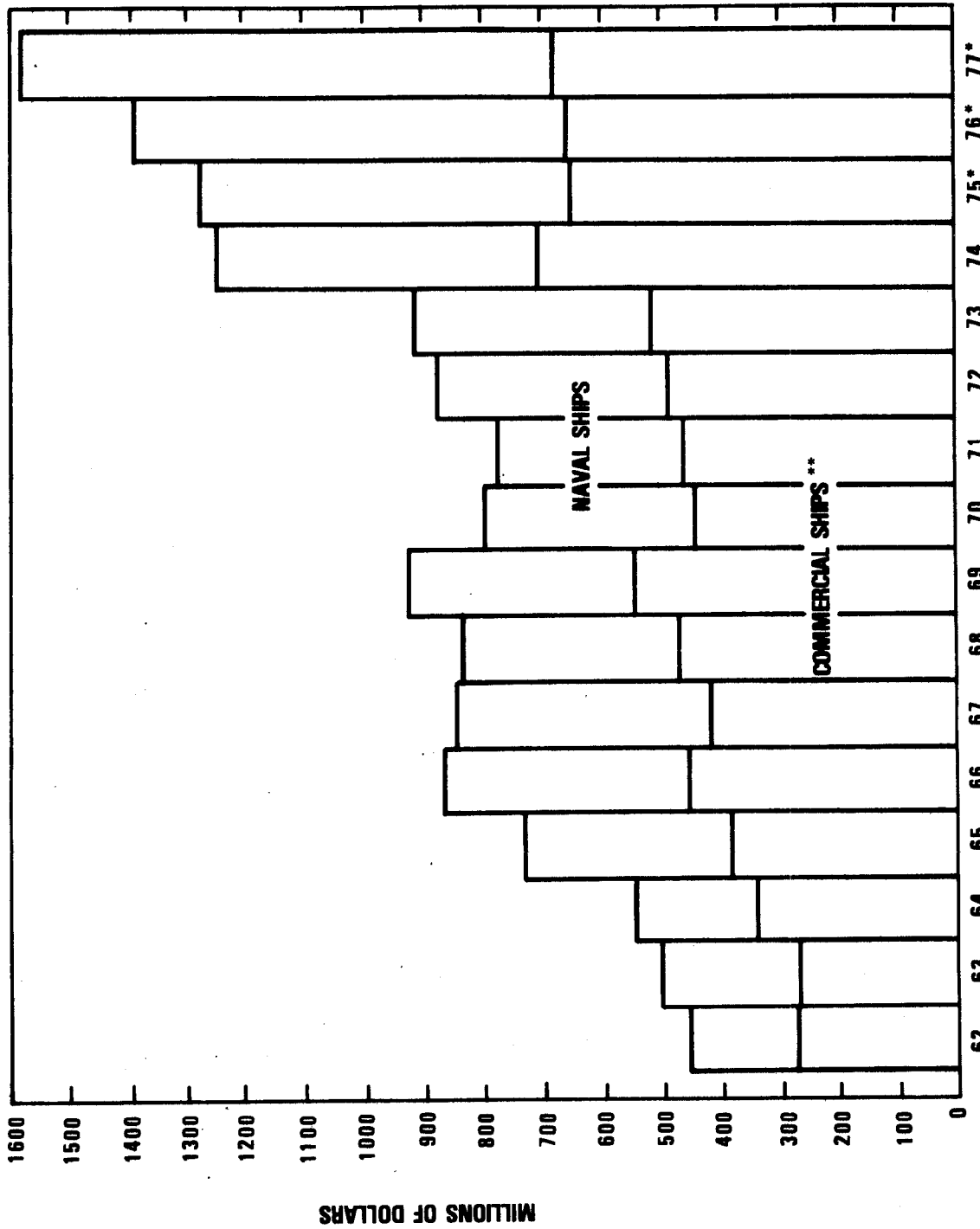




# U.S. SHIPYARD EMPLOYMENT



**DOLLAR VOLUME REPAIR AND CONVERSION BY PRIVATE YARDS**



\*ESTIMATED \*\*INCLUDES MSC (MSTS) WORK  
 SOURCE - BUREAU OF CENSUS AND SHIPBUILDERS COUNCIL OF AMERICA

TABLE I

SHIP CONSTRUCTION CAPABILITY

BY SHIP TYPE

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

Region	Shipyard	Shipway or Basin	Maximum Ship Size	General Cargo						Dry Bulk		
				Mob. Cargo 475 x 68	Container 610 x 90	RO/RO 684 x 102	LASH 893 x 100	Container 947 x 106	21,300 570 x 75	51,000 600 x 105	100,000 900 x 106	
EAST	Bath Iron Works	A	650 x 88	1	1	0	0	0	1	0	0	
		B	700 x 130	1	1	1	0	0	1	1	0	
		C	700 x 130	(3)	(3)	(2)	(0)	(0)	(3)	(2)	(0)	
	Bethlehem Steel, Sparrows Pt.	7	900 x 108	1	1	1	1	1	1	1	1	
		8	650 x 90	1	1	0	0	0	1	0	0	
		9	650 x 90	1	1	1	1	1	1	1	1	
		10	900 x 108	1	1	1	1	1	1	1	1	
	General Dynamics, Quincy	6	1200 x 192	4	3	2	(4)	(3)	(8)	(5)	(3)	
		7	860 x 123	(8)	(7)	(4)	(3)	(1)	(1)	(5)	(3)	
		8	936 x 143	2	1	1	1	0	1	1	0	
11		860 x 123	2	1	1	1	0	1	1	1		
12		860 x 144	2	1	1	1	0	1	1	0		
		860 x 144	(10)	(5)	(5)	(5)	(1)	(5)	(5)	(1)		
Maryland S/B & D/D	1	850 x 110	1	1	1	1	0	1	1	0		
			(1)	(1)	(1)	(0)	(0)	(1)	(1)	(0)		
Newport News S/B & DD	6	715 x 93	1	1	0	0	0	1	0	0		
	7	715 x 93	1	1	1	1	1	1	1	1		
	8	940 x 125	2	1	1	1	1	1	1	1		
	9	940 x 125	2	1	1	1	1	1	1	1		
	10	960 x 124	2	2	1	1	1	2	2	2		
	11	1100 x 136	2	2	1	1	1	2	2	2		
12	1600 x 240	9	5	4	(8)	(5)	(14)	4	(9)			
		(19)	(13)	(8)	(5)	(3)	(14)	(9)	(5)			

Region	Shipyard	Shipway or Basin	Maximum Ship size	General Cargo						Dry Bulk		
				Wob. Cargo 475 x 68	Container 610 x 90	RO/NO 684 x 102	IASH 893 x 100	Container 947 x 106		21,300 570 x 75	51,000 600 x 105	100,000 900 x 106
Seatrain S/B Corp.	3	740 x 108	1	1	1	0	0	0	1	1	0	
			3	2	1	1	1	1	2	2	1	
			3	2	1	1	1	1	2	2	1	
	6	1094 x 143	(7)	(5)	(3)	(2)	(2)	(7)	(5)	(2)	(2)	
			1	1	1	0	0	1	1	1	0	
			1	1	1	0	0	1	1	1	0	
Sun S/B & D/D	8	745 x 129	2	2	1	1/2	1/2	2	1	1	0	
			2	2	1	1/2	1/2	2	1	1	0	
	Slab A Slab B	700 x 195	2	2	1	1/2	1/2	2	1	1	0	
			2	2	1	1/2	1/2	2	1	1	0	
TOTAL EAST COAST			54	40	27	12	7	44	31	12		
GULF	Alabama D/D & S/B	523 x 68	1	0	0	0	0	0	0	0	0	
			2	0	0	0	0	0	0	0	0	
			4	0	0	0	0	0	0	0	0	
			5	1	1	0	0	0	1	0	0	
			(4)	(1)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	
Avondale	960 x 176	8	2	2	2	2	4	2	2	2		
		6	5	3	3	3	6	5	3	3		
		(14)	(7)	(5)	(5)	(5)	(10)	(7)	(5)	(5)		
Beth. Beaumont	842 x 96	1	1	1	0	0	1	0	0	0		
		(1)	(1)	(1)	(0)	(0)	(1)	(0)	(0)	(0)		
Galveston S/B	700 x 100	1	1	0	0	0	1	0	0	0		
		(1)	(1)	(0)	(0)	(0)	(1)	(0)	(0)	(0)		
Levingston	1100 x 90	2	1	0	0	0	1	0	0	0		
		(2)	(1)	(0)	(0)	(0)	(1)	(0)	(0)	(0)		

Region	Shipyard	Shipway or Basin	Maximum Ship Size	General Cargo						Dry Bulk			
				Job. Cargo 475 x 68	Container 610 x 90	RO/RO 684 x 102	LASH 893 x 100	Container 947 x 106	21,300 570 x 75	51,000 600 x 105	100,000 900 x 106		
WEST	Litton/Ingalls	1	690 x 85	1	1	0	0	0	0	1	0	0	
		2	550 x 90	1	0	0	0	0	0	0	0	0	
		7	650 x 90	1	0	0	0	0	0	0	0	0	
		8	650 x 90	1	1	0	0	0	0	0	1	0	
		9	650 x 90	1	1	0	0	0	0	0	1	0	
		10	650 x 90	1	1	0	0	0	0	0	1	0	
		WB	820 x 176	6	6	6	0	0	0	6	6	0	
				(12)	(11)	(9)	(0)	(0)	(11)	(6)	(0)	(0)	
			Marathon	1	1100 x 150	4	1	1	1	1	1	1	1
				(4)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
	Tampa Ship Repair	3	600 x 150	1	0	0	0	0	1	1	0		
		(1)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(1)			
TOTAL GULF COAST				39	23	13	6	6	27	15	6		
	Beth San Francisco	4	550 x 90	1	0	0	0	0	0	0	0		
		(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)			
	FMC Corporation	4	700 x 100	1	1	0	0	0	1	0	0		
		(1)	(1)	(0)	(0)	(0)	(0)	(0)	(1)	(0)			
	Lockheed S/B	1	650 x 95	1	0	0	0	0	1	0	0		
		3	650 x 90	1	1	0	0	0	1	0	0		
		21	700 x 100	1	1	0	0	0	1	0	0		
		(3)	(2)	(0)	(0)	(0)	(0)	(0)	(3)	(0)			
	National Steel & S/B	1	996 x 170	4	1	1	1	1	2	1	1		
		2	700 x 90	1	1	0	0	0	1	0	0		
		3	900 x 106	1	1	1	1	1	1	1	1		
		4	900 x 106	1	1	1	1	1	1	1	1		
		(7)	(4)	(3)	(3)	(3)	(3)	(1)	(5)	(3)			

Region	Shipyard	Shipway or Basin	Maximum Ship Size	General Cargo						Dry Bulk		
				Job. Cargo 475 x 68	Container 110 x 90	RO/PO 134 x 102	LASH 893 x 100	Container 947 x 106	21,300 570 x 75	51,000 600 x 105	100,000 900 x 106	
Todd, San Pedro		1	800 x 84	1	0	0	0	0	1	0	0	
		2	800 x 84	1	0	0	0	0	1	0	0	
Todd, Seattle		1A	550 x 96	1	0	0	0	0	0	0	0	
				(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	
TOTAL WEST COAST				15	7	3	3	1	11	3	3	
GREAT LAKES	American S/B-Lorain	4	700 x 75	1	0	0	0	0	1	0	0	
		GD2	705 x 78	1	0	0	0	0	1	0	0	
		GD3	1021 x 121	2	1*	1*	1*	1*	1	1*	1*	
				(4)	(1)	(1)	(1)	(1)	(3)	(1)	(1)	
American S/B-Toledo		GD1	529 x 68	1	0	0	0	0	0	0	0	
		GD2	634 x 78	1	0	0	0	0	1	0	0	
				(2)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	
Bay S/B Corp.		GD1	1146 x 136	2	1*	1*	1*	1*	1	1*	1*	
		3	750 x 105	1	1*	1*	0	0	1	1*	0	
		4	600 x 80	1	0	0	0	0	1	0	0	
				(4)	(2)	(2)	(1)	(1)	(3)	(2)	(1)	
Defoe S/B Co.		1	900 x 92	1	1*	0	0	0	1	0		
				(1)	(1)	(0)	(0)	(0)	(1)	(0)	(0)	

\*Maximum size ship that can exit St. Lawrence Seaway locks is 730' x 78'.

Region	Shipyard	Shipway or Basin	Maximum Ship Size	General Cargo							Dry Bulk		
				475 x 68 Mob. Cargo	610 x 90 Container	684 x 102 RO/RO	893 x 100 LASH	947 x 106 Container	21,300 570 x 75	51,000 600 x 105	100,000 900 x 106		
	Fraser Shipyards	GD2	825 x 76	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)		
	TOTAL GREAT LAKES			12	4	3	2	2	9	3	2		
	TOTAL ALL YARDS			120	74	46	23	16	91	52	23		

\*Maximum size ship that can exit St. Lawrence Seaway  
locks is 730' x 78'



Region	Shipyard	Shipway or Basin	Maximum Ship Size	TANKERS										ORC							
				25,000 620 x 75	38,000 688 x 90	49,000 894 x 105	120,000 920 x 138	125,000 Cu. M. 932 x 140	225,000 1100 x 140	215,000 1100 x 178	390,770 1204 x 228	80,000 884 x 104	140,000 998 x 143								
EAST	Bath Iron Works	A	650 x 88	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		B	700 x 130	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		C	700 x 130	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Bethlehem Steel, Sparrows Point	7	900 x 108	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		8	650 x 90	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		9	650 x 90	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		10	900 x 108	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	General Dynamics, Quincy		1200 x 192	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		6	860 x 123	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		7	936 x 143	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8		860 x 123	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11		860 x 144	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12		860 x 144	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Maryland S/B & D/D		850 x 110	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Newport News S/B & D/D	6	715 x 93	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7	715 x 93	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	8	940 x 125	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	9	940 x 125	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10	960 x 124	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11	1100 x 136	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	1600 x 240	6	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
		(13)	(10)	(4)	(2)	(2)	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(2)	

Region	Shipyard	Shipway or Basin	Maximum Ship Size	Tankers							ORO					
				25,000 620 x 75	36,000 688 x 90	89,000 894 x 105	120,000 920 x 138	125,000 cu. M. 932 x 140	225,000 1100 x 140	265,000 1100 x 178	390,770 1204 x 228	63,000 886 x 106	140,000 998 x 143			
GULF	Seatrains S/B Corp.	3	740 x 108	1	1	0	0	0	0	0	0	0	0	0	0	
		5	1094 x 143	2	1	1	1	1	0	0	0	0	0	1	1	
		6	1094 x 143	(5)	(3)	(2)	(2)	(2)	(0)	(0)	(0)	(2)	(2)	(2)	(2)	
	Sun S/B & D/D	6	745 x 129	1	1	0	0	0	0	0	0	0	0	0	0	0
		8	745 x 129	1	1	0	0	0	0	0	0	0	0	0	0	0
		Slab A Slab B	700 x 195 700 x 195	2 (6)	2 (6)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)
TOTAL EAST COAST				40	31	13	7	7	6	3	2	2	13	6		
GULF	Alabama D/D/ & S/B	1	523 x 68	0	0	0	0	0	0	0	0	0	0	0	0	
		2	523 x 68	0	0	0	0	0	0	0	0	0	0	0	0	
		4	523 x 68	0	0	0	0	0	0	0	0	0	0	0	0	
		5	620 x 68	1	0	0	0	0	0	0	0	0	0	0	0	0
				(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
GULF	Avondale	1	960 x 176	4	2	2	2	2	0	0	0	0	0	2	0	
		2	1200 x 130	5	3	3	0	0	0	0	0	0	0	3	0	
				(9)	(5)	(5)	(2)	(2)	(0)	(0)	(0)	(0)	(5)	(0)		
GULF	Beth. Beaumont	1	842 x 96	1	1	0	0	0	0	0	0	0	0	0	0	
				(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	
GULF	Galveston S/B	1	700 x 100	1	1	0	0	0	0	0	0	0	0	0	0	
				(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	

\*Sun Ship has capability of building a ship of this deadweight tonnage if deeper draft to compensate for shipways' beam limitation of 195 feet.

Region	Shipyard	Shipway or Basin	Maximum Ship Size	Tanners										NRC		
				25,000 620 x 75	38,000 688 x 90	49,000 891 x 105	120,000 920 x 130	125,000, M. 932 x 140	225,000 1100 x 140	245,000 1100 x 170	390,770 1201 x 220	40,000 888 x 106	160,000 998 x 143			
	Levingston	1	1100 x 90	1 (1)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Litton/Ingalls	1	690 x 85	1	0	0	0	0	0	0	0	0	0	0	0	0
		2	550 x 80	0	0	0	0	0	0	0	0	0	0	0	0	0
		7	650 x 90	1	0	0	0	0	0	0	0	0	0	0	0	0
		8	650 x 90	1	0	0	0	0	0	0	0	0	0	0	0	0
		9	650 x 90	1	0	0	0	0	0	0	0	0	0	0	0	0
		10	650 x 90	1	0	0	0	0	0	0	0	0	0	0	0	0
		WB	820 x 176	6 (11)	6 (6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Marathon	1	1100 x 150	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	1 (1)	0 (0)	0 (0)	0 (0)	1 (1)	1 (1)
	Tampa Ship Repair	3	600 x 150	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	TOTAL GULF COAST			25	15	6	3	3	3	1	0	0	0	0	6	1
WEST	Beth. San Francisco	4	550 x 90	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	FMC Corporation	4	700 x 100	1 (1)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Lockheed S/B	1	650 x 95	1	0	0	0	0	0	0	0	0	0	0	0	0
		3	650 x 90	1	0	0	0	0	0	0	0	0	0	0	0	0
		21	700 x 100	1 (3)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Region	Shipyard	Shipway or Basin	Maximum Ship Size	Tankers							OBO						
				25,000 620 x 75	35,000 778 x 90	89,000 894 x 105	120,000 920 x 138	125,000 cu. M 932 x 140	225,000 1100 x 140	265,000 1100 x 178	390,770 1204 x 228	80,000 884 x 106	160,000 998 x 143				
National Steel S/B		1	996 x 170	2	1	1	1	1	1	0	0	0	0	1	0	0	
		2	700 x 90	1	1	0	0	0	0	0	0	0	0	0	0	0	0
		3	900 x 106	1	1	1	0	0	0	0	0	0	0	0	0	0	0
		4	900 x 106	1	(4)	(3)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(1)	(0)
Todd, San Pedro		1	800 x 84	1	0	0	0	0	0	0	0	0	0	0	0	0	
		2	800 x 84	(2)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Todd, Seattle		1A	550 x 96	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL WEST COAST				11	6	3	1	1	1	0	0	0	0	1	1	1	
GREAT LAKES	American S/B-Iorain	4	700 x 75	1	0	0	0	0	0	0	0	0	0	0	0	0	
		GD2	705 x 78	1	0	0	0	0	0	0	0	0	0	0	0	0	
		GD3	1021 x 121	1	1*	1*	0	0	0	0	0	0	0	0	1*	1	0
				(3)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	
American S/B-Toledo		GD1	529 x 68	0	0	0	0	0	0	0	0	0	0	0	0	0	
		GD2	634 x 78	1	0	0	0	0	0	0	0	0	0	0	0	0	
				(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	

\*Maximum size ship that can exit St. Lawrence Seaway Locks is 730' x 78'.

Region	Shipyard	Shipway or Basin	Maximum Ship Size	Tankers										ORO				
				25,000 620 x 75	36,000 688 x 90	89,000 897 x 105	120,000 920 x 138	125,000cu. m. 932 x 140	225,000 1170 x 140	265,000 1100 x 178	390,770 1207 x 228	60,000 886 x 106	160,000 998 x 143					
Bay S/B Corp.		GD1	1146 x 136	1	1*	0	0	0	0	0	0	0	0	0	0	0	0	
		3	750 x 105	1	1*	0	0	0	0	0	0	0	0	0	0	0	0	0
		4	600 x 80	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				(3)	(2)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Defoe S/B Co.		1	900 x 92	1	1*	0	0	0	0	0	0	0	0	0	0	0	0	
				(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Fraser Shipyards		GD2	825 x 76	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
				(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
TOTAL GREAT LAKES				9	4	2	0	0	0	0	0	0	0	0	0	0	0	
TOTAL ALL YARDS				85	56	24	11	11	7	3	2	22	8					

\*Maximum size ship that can exit St. Lawrence Seaway locks is 730' x 78'.

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPE

SUMMARY

REGION	GENERAL CARGO						DRY BULK			
	Mob. Cargo 475 x 68	Container 610 x 90	RO/RO 684 x 102	LASH 893 x 100	Container 947 x 106		21,300 570 x 75	51,000 600 x 105	100,000 900 x 106	
East Coast	54	40	27	12	7		44	31	12	
Gulf Coast	39	23	13	6	6		27	15	6	
West Coast	15	7	3	3	1		11	3	3	
Great Lakes	12	4	3	2	2		9	3	2	
<b>TOTAL POSITIONS ALL YARDS</b>	<b>120</b>	<b>74</b>	<b>46</b>	<b>23</b>	<b>16</b>		<b>91</b>	<b>52</b>	<b>23</b>	

REGION	TANKERS										OBO	
	25,000 620 x 75	38,000 688 x 90	89,000 894 x 105	120,000 920 x 138	125,000cuM 932 x 140	225,000 1100 x 140	265,000 1100 x 178	390,770 1204 x 228	80,000 886 x 106	160,000 998 x 143		
East Coast	40	31	13	7	7	6	3	2	13	6		
Gulf Coast	25	15	6	3	3	1	0	0	6	1		
West Coast	11	6	3	1	1	0	0	0	1	1		
Great Lakes	9	4	2	0	0	0	0	0	2	0		
<b>TOTAL POSITIONS ALL YARDS</b>	<b>85</b>	<b>56</b>	<b>24</b>	<b>11</b>	<b>11</b>	<b>7</b>	<b>3</b>	<b>2</b>	<b>22</b>	<b>8</b>		

TABLE II

MAJOR U.S. PRIVATE SHIPYARDS

NUMBER OF SHIPBUILDING WAYS BY LENGTH

(MAXIMUM SHIP SIZE)

TABLE II  
 MAJOR U.S. PRIVATE SHIPYARDS  
 NUMBER OF SHIPBUILDING WAYS BY LENGTH (MAX. SHIP SIZE)

Length OA (In Feet):	475	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1300	1400	1600	
<u>ATLANTIC COAST</u>																			
Bath Iron Works	3	3	3	3	2	3	3	3	3	1	1	1	1	1	1				
Beth-Sparrows Point	5	5	5	5	3	5	5	5	1										
General Dynamics, Quincy	5	5	5	5	5	5	1	1											
Maryland SB & DD	1	1	1	1	1	1	1	5	5	3	2	2	1	1	1	1	1	1	
Newport News SB & DD	7	7	7	7	7	5	5	5	5	3	2	2	2	1	1	1	1	1	
Seatrain SB Corp	3	3	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	
Sum SB & DD	4	4	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	
TOTAL	(28)	(28)	(28)	(28)	(25)	(17)	(17)	(17)	(12)	(7)	(6)	(6)	(4)	(3)	(3)	(2)	(2)	(1)	

<u>GULF COAST</u>																			
Alabama DD & SB	4	4	1	5	5	5	5	5	5	5	3	3	3	3	3				
Avondale	8	8	8	1	1	1	1	1											
Beth-Beaumont	1	1	1	5	1	1	1												
Ingalls-E. Bank	6	6	5	6	6	6	6	6											
Ingalls-W. Bank	6	6	6	6	6	6	6												
Galveston SB	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Levingston SB Co.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Marathon	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Tampa Ship Repair	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
TOTAL	(29)	(26)	(25)	(20)	(15)	(14)	(14)	(7)	(7)	(7)	(5)	(5)	(5)	(3)	(3)	(3)	(3)	(3)	



MAJOR U.S. PRIVATE SHIPYARDS

NUMBER OF SHIPBUILDING WAYS BY LENGTH (MAX. SHIP SIZE)

Length OA (In Feet):	475	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1300	1400	1500	1600	
<u>PACIFIC COAST</u>																				
Beth-San Francisco	1	1		1	1															
FMC Corporation	1	1		3	3															
Lockheed SB	3	3		3	3															
National Steel & SB	4	4		4	4	3	3	3	3	1	1									
Todd-San Pedro	2	2		2	2	2	2													
Todd-Seattle	1	1																		
<b>TOTAL</b>	<b>(12)</b>	<b>(12)</b>	<b>(10)</b>	<b>(10)</b>	<b>(8)</b>	<b>(5)</b>	<b>(5)</b>	<b>(5)</b>	<b>(3)</b>	<b>(3)</b>	<b>(1)</b>	<b>(1)</b>								
<u>GREAT LAKES*</u>																				
American SB-Lorain	3	3	3	3	3	1	1	1	1	1	1									
American SB-Toledo	2	1	1	1																
Day SB Corp.	3	3	3	2	2	2	1	1	1	1	1	1								
Defco SB Co.	2	2	2	1	1	1	1	1	1											
Fraser Shipyards	2	2	2	1	1	1	1													
<b>TOTAL</b>	<b>(12)</b>	<b>(11)</b>	<b>(11)</b>	<b>(7)</b>	<b>(7)</b>	<b>(5)</b>	<b>(4)</b>	<b>(3)</b>	<b>(3)</b>	<b>(2)</b>	<b>(2)</b>	<b>(1)</b>	<b>(1)</b>							
<b>Grand Total</b>	<b>61</b>	<b>77</b>	<b>74</b>	<b>65</b>	<b>55</b>	<b>41</b>	<b>40</b>	<b>30</b>	<b>25</b>	<b>17</b>	<b>14</b>	<b>12</b>	<b>10</b>	<b>6</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>1</b>		
<b>All Coasts and Great Lakes</b>																				

\*Maximum size ship that can exit St. Lawrence Seaway locks is 730' x 78'.

APPENDIX A

STANDARD FORM 17

FACILITIES AVAILABLE FOR THE CONSTRUCTION

OR REPAIR OF SHIPS

FACILITIES AVAILABLE FOR THE CONSTRUCTION OR REPAIR OF SHIPS

DATE

TO: (Complete departmental address)

SHIPYARD AND ADDRESS

INSTRUCTIONS

(Forward original copy to appropriate Department of Defense Office or Maritime Administration, Washington, D.C.)

BUILDINGS WAYS (M.L.W.)

NO. OF WAY	LAUNCHING (Check one)	DIMENSIONS	MAXIMUM SHIP SIZE (Ton 2,240 lbs.)	DEPTH OF WATER		CONDITION OF WAY	CRANES SERVING WAY		LIFT CAPACITY (Std. tons)		
				Over way end	At drop off		No.	Type (Plus hook height for bridge cranes)			
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
	<input type="checkbox"/> End <input type="checkbox"/> Side <input type="checkbox"/> Basin	Length Width Depth	Length O.A. Beam Weight								
LENGTH OF LAUNCHING RUN				DEPTH OF RUN AT M.L.W.		TIDAL RANGE (Difference M.L.-M.H.)		IS FIRE PROTECTION AVAILABLE ON BUILDING WAY? YES <input type="checkbox"/> NO <input type="checkbox"/>		IS SNUBBING NECESSARY? YES <input type="checkbox"/> NO <input type="checkbox"/>	

SHIPS' BERTHS (PIERS, WHARVES, BULKHEADS, MOORING DOLPHINS (M.L.W.))										
NO.	TYPE	LENGTH (Actual and usable)	WATER DEPTH		HEIGHT OF DOCK	USE REPAIR AND/OR OUTFITTING	SERVICE AVAILABLE (Use abbreviations of services and measure indicated under legend)	CRANES SERVING BERTHS, ETC.		LIFT CAPACITY (Standard tons)
			Inboard	Outboard				No.	Type (Hook height above M.L.W.)	
		Act. Use.								Lift Reach
		Act. Use.								Lift Reach
		Act. Use.								Lift Reach
		Act. Use.								Lift Reach
		Act. Use.								Lift Reach
		Act. Use.								Lift Reach
		Act. Use.								Lift Reach
		Act. Use.								Lift Reach
		Act. Use.								Lift Reach
		Act. Use.								Lift Reach

DRYDOCKS (mean HIGH water) (List building docks under building ways)											
DOCK NO.	MATERIAL CONSTD. OF—TYPE Floating—(FD); Graving—(GD); Marine Railway—(MR)	MAXIMUM SHIP SIZE ACCOMMODATED LENGTH OA-BEAM	LENGTH			CLEAR WIDTH			DEPTH/DRAFT		LIFTING CAPACITY (Ton 2,240 lbs.)
			Overall	At coping (GD); on pontoons (FD)	At keel blocks; on Cradle (MR)	At top; cradle (MR)	At keel blocks	Over sill (GD)	Over floor	Over keel blocks	

LEGEND: (Abbreviations of Services)  
 Fresh water..... F.W.—G.P.M.—P.S.I.  
 Salt water..... S.W.—G.P.M.—P.S.I.  
 Steam..... S.—P./H.R.—P.S.I.  
 Air..... A.—C.P.M.—P.S.I.  
 Electric power..... E.—V.—A.C.—AMP  
 E.—V.—D.C.—AMP  
 Fire protection..... Fire protection  
 Sanitary sewer..... Sanitary sewer  
 FR—G.P.M.—P.S.I.  
 SS—Year No.  
 Sheet 2 of 6

PRINCIPAL SHOPS AND BUILDINGS										ALL OTHER SHOPS (List names and dimensions, include mold loft, if any)								
NAME OF SHOP OR BUILDING	DIMENSIONS OF SHOP OR BUILDING	MATERIALS PROCESSED (See note)	LARGEST EXIT		WEIGHT OF MATERIAL OR NUMBER AND SIZE OF UNITS PRODUCED PER 8 HOURS (See note)	Area serviced	Height hinge	Boom length	Capacity at reach		Max. reach	Cap. (Std. tons)	Type	Area/shop serviced	Height of hook	Max. span	Cap. Std. tons	Hgt. of hook above base at full reach
			Width	Height														
Fabricating																		
Plate			X X X X	X X X X	X X X X X X													
Sheet metal																		
Subassembly																		
Carpenter			X X X X	X X X X	X X X X X X X X													
Woodworking			X X X X	X X X X	X X X X X X X X													
Boat assembly or molding																		
Machine		X X X X X X	X X X X	X X X X	X X X X X X X X													
Electrical		X X X X X X	X X X X	X X X X	X X X X X X X X													
Electronic		X X X X X X	X X X X	X X X X	X X X X X X X X													
Pipe																		
Galvanizing																		
Foundry																		
Rigger		X X X X X X	X X X X	X X X X														
NOTE - Indicate materials as steel, aluminum, galvanized, plastic, wood, plywood, sheet metal, etc.																		
SHOP OR YARD CRANES (5 tons or over)																		
BRIDGE TYPE																		
STATIONARY, RAIL OR MOBILE																		
Cap. Std. tons	Max. span	Height of hook	Area/shop serviced	Type	Cap. (Std. tons)	Max. reach	Capacity at reach	Boom length	Height hinge	Area serviced	Hgt. of hook above base at full reach							

**MAJOR ITEMS OF MACHINE TOOLS AND EQUIPMENT** (List briefly such of the large items as will indicate the capacities of all important shops in maximum work piece size, e.g., 30" plate bending rolls, 10' plate shears, 400 ton Hyd. press, 30' plate furnace, engine lathes 36" x 20' b.c., etc.)

**STORAGE SPACE (Sq. ft.) FOR COMPONENTS AND MATERIALS** (Less boat storage) (List dimensions for each area, plus type material stored)

<p style="text-align: center;">65</p>							
<b>RAW STEEL STORAGE (Sq. ft.)</b>		<b>WELDING AND ASSEMBLY (Sq. ft.)</b>					
<b>ACREAGE LEGALLY CONTROLLED</b>							
<b>IN USE</b>	<b>DEVELOPED (including in use)</b>					<b>TOTAL (including undeveloped)</b>	
<b>EXISTING LOCAL ORDINANCES LIMITING PRODUCTIVE USE</b>							
<b>LIMITATIONS IMPOSED BY PROPERTY ZONING CLASSIFICATION</b>							
<b>YARD LAYOUT—PLEASE FURNISH A PLOT PLAN OF YARD OR PLANT, IF AVAILABLE</b>							

PROJECTS UNDER CONSTRUCTION WHICH WILL ALTER NAVIGATIONAL RESTRICTIONS (Specify projects and state effect and estimated completions)

LOCATION OF PRODUCTION FACILITIES FOR PRODUCTS LISTED IN ITEM 11, OF STD. FORM 129 ON WATERFRONT  Yes  No

EMPLOYMENT	CURRENT	CURRENT NO. SHIFTS	MOBILIZATION—SHIFTS
Management, administration			
Professional, engineering			
Professional, technical (All others)			
Production, skilled			
Production, semiskilled			
Production, unskilled			
Nonproduction			
Total		x x x x x x	x x x x

NUMBER OF PRODUCTION PERSONNEL PRESENTLY ENGAGED IN SHIP AND/OR BOAT IN SHIP OR BOAT REPAIR CONSTRUCTION

APPROXIMATE TOTAL EMPLOYMENT OF ALL AFFILIATED CONCERNS ONLY LISTED IN ITEM 8, OF STD. FORM 129 (NOTE: concern that directly or indirectly through one or more intermediaries controls, or is controlled by or is under common control with, the reporting firm. Common ownership of stock by individuals does not in itself, constitute affiliation.)

DISTANCE TO NEAREST RAILROAD CONNECTION

DISTANCE TO NEAREST AIRPORT—IDENTIFY

LARGEST CONVEYANCE AVAILABLE AND MAXIMUM DIMENSIONS OF LOAD, FOR OVERLAND TRANSPORTATION OF FINISHED PRODUCTS (Not to exceed limitations imposed by local ordinances)

NAVIGATIONAL RESTRICTIONS (INDICATE ALL AT M.L.W.)

MINIMUM CHANNEL TO TIDEWATER  
MINIMUM HORIZONTAL AND VERTICAL BRIDGE CLEARANCES TO TIDEWATER (Identify structures)

LIMITING LOCK DIMENSIONS TO TIDEWATER (Identify locks)

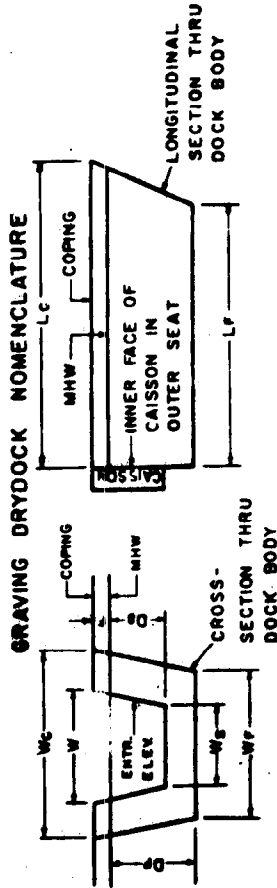
DESCRIPTION OF TYPES OF WORK NORMALLY SUBCONTRACTED

**PRODUCTION EXPERIENCE** (List at least three of the largest and the most complex ships or boats constructed, indicating (1) date completed, (2) hull length, beam, and molded depth, (3) type propulsion unit (fully described), (4) horsepower, (5) electrical and/or electronic installation, (6) special piping features, (7) size and tensile strength of plates, if steel, or type hull material, if other than steel, (8) special annealing, heat treating, or stress relieving problems encountered, if steel, plus, (9) any other important problems resolved). (NOTE.—If no previous construction experience give detailed description of major construction or industrial manufacturing work considered comparable to ship or boat construction.)



GRAVING DRYDOCK CHARACTERISTICS SUMMARY

**KEY**  
 MHW - Mean High Water  
 DF - Depth of Dock from MHW to Floor  
 DS - Depth of Dock from MHW to sill  
 LC - Length of Dock at coping  
 LF - Length of Dock at Floor  
 W - Width of Dock at top of entrance.  
 WC - Width of Dock at coping or maximum clear width above Dock Floor.  
 WF - Width at Dock Floor  
 WS - Width of Dock at entrance (sill)  
 F - Freeboard. Distance from MHW to top of coping. Indicate if part of F may be superflooded.



DRYDOCK NUMBER	LENGTH		ENTRANCE DIMENSIONS			DOCK BODY DIMENSIONS			SUPERFLOODING	STANDARD DEFINITION	A. C. AMPERES (60 HZ-3Ø)			REMARKS (e.g. indicate dimensions of pits in dock floor)
	FLOOR	COPING	SILL	COPING	DEPTH	FLOOR	WIDTH	DEPTH			DEPTH	FREEBOARD	480V MAX. HOTEL (INDUST)	
	L <sub>f</sub>	L <sub>c</sub>	W <sub>s</sub>	W	D <sub>s</sub>	W <sub>f</sub>	WC	M.H.W.	D <sub>f</sub>	F				
1														
2														
3														
4														
5														

\* Alternate Hotel Service Consists of 2400 V Supply and 1000 KVA (480V SEC.) Portable Transformer.  
 \*\* Test and Check-out Power Consists of 13,200 V Supply and 3,750 KVA (480V SEC.) Portable Transformer.

FLOATING DRYDOCK CHARACTERISTICS SUMMARY

FLOATING DRYDOCK	LENGTH INSIDE FLOATER OVER KEEL BLOCKS	MAXIMUM DEPTH OVER BLOCKS	CLEAR WIDTH BETWEEN WINGWALLS	LIFT CAPACITY (TONS)	NORMAL KEEL BLOCK HEIGHT	A.C. AMPERES (60 HZ-3 $\phi$ )			REMARKS (Indicate existence of hauling blocks, if end section can be lowered, and max length of ship DD can accommodate.)
						480V MAX. HOTEL (INDUS)	2400V ALT. HOTEL	13.2 KV TEST/ CHECK	

APPENDIX B

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

LEGEND: Remarks Column

1/ Type of work usually engaged in.

2/ Employment - current.

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES <sup>a/</sup>

Name and location	Maximum Ship Size (LOA--Beam)	Berths/Piers	Remarks
	SW--Shipway GD--Graving Drydock FD--Floating Drydock MR--Marine Railway	Usable length in feet  Longest Total linear feet	
<u>EAST COAST</u>			
<u>SHIPBUILDING YARDS</u>			
Bath Iron Works Corp. Bath, Maine	(2) 650 (+) x 88 SW 700 x 130 SW 500 x 81 FD	<u>850</u> 2900	1/ Construction, conversion and repairs-all types of vessels. 2/ 3,330  Also has floating bow drydock for sonar domes.
Beth. Steel Corp. Sparrows Point, Md.	(2) 650 x 90 SW (2) 900 x 108 SW 1200 x 192 GD	<u>1260</u> 3968	1/ New ship construction - to vessels 1200' in length. 2/ 4,040
General Dynamics Corp. Quincy SB Division Quincy, Mass.	(2) 860 x 123 GD 936 x 143 GD (2) 860 x 144 GD	<u>823</u> 4621	1/ Construction, conversion and repairs - all types of vessels. 2/ 4,800
Maryland SB and DD Co. Baltimore, Md.	850 x 110 SW 775 x 110 FD 715 x 91 FD 900 x 146 FD	<u>1902</u> 5651	1/ Construction, conversion and repairs - all types of vessels. 2/ 1,150
Newport News SB & DD Co. Newport News, Va.	(2) 715 x 93 SW (2) 940 x 125 SW 960 x 124 GD* 1100 x 136 GD* 650 x 88 GD 862 x 114 GD 458 x 68 GD 1600 x 240 GD**	<u>1670</u> 15070	1/ Construction, conversion and repairs - all types of vessels. 2/ 23,600  * Used for construction.  ** Located in new North yard.  This GD was scheduled for completion in December 1976.

a/ Shipbuilding: for ships 475' x 68' or above.

Repair: drydocking facilities for ships 300' in length or above.

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

Name and location	Maximum Ship Size (LOA--Beam)		Berths/Piers		Remarks
	SW--Shipway	GD--Graving Drydock	Usable length in feet	Longest Total linear feet	
Seatrain SB Corp. Brooklyn, N.Y.	740 x 108 (2) 1094 x 143	GD GD	<u>1200</u> 3190		1/ New ship construction - to vessels 1094' in length.  2/ 1,700
Sun SB and DD Co. Chester, Pa.	(2) 745 x 129 (2) 700 x 195 1100 x 195	SW SW* FD	<u>1100</u> 3900		1/ Construction, conversion and repairs - all types of vessels.  2/ 3,700  *Shipbuilding platform. Maximum ship 1400' x 195' or two ships 700' x 195' simultaneously.
<u>EAST COAST</u>					
<u>REPAIR YARDS WITH DRYDOCK FACILITIES</u>					
Beth. Steel Corp. Baltimore, Md.	530 x 81 775 x 106 675 x 92 585 x 71 456 x 44	FD FD FD GD GD	<u>964</u> 12944		1/ Ship repairs and conversion  2/ 1,800
Beth. Steel Corp. East Boston, Mass.	690 x 92 523 x 86	FD FD	<u>1020</u> 3111		1/ Ship repairs and conversion  2/ 500
Beth. Steel Corp. Hoboken, N.J.	443 x 66 685 x 106 549 x 90 640 x 96 1064 x 138	FD FD FD FD GD*	<u>923</u> 3000		1/ Ship repairs and conversion  2/ 650  *Military Ocean Terminal, Bayonne, N.J. - leased by Bethlehem.
Brewer DD Co. Staten Island, N.Y.	400 x 81 500 x 81	FD FD	<u>653</u> 2606		1/ Ship repairs and conversion  2/ 200

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

Name and location	Maximum Ship Size (LOA--Beam)		Berths/Piers		Remarks
	SW--Shipway		Usable length in feet	Longest Total linear feet	
Bromfield Corp. United SB Division East Boston, Mass.	376 x 36	FD	<u>430</u> 790		1/ Ship repairs and conversion. 2/ 120
Ira S. Bushey & Sons, Inc. Brooklyn, N.Y.	455 x 71 300 x 66	FD FD	<u>786</u> 4086		1/ Ship repairs and conversion. 2/ 215
Coastal DD & Repair Corp. Brooklyn, N.Y.	340 x 60 456 x 80 706 x 112	GD GD GD	<u>575</u> 1150		1/ Ship repairs and conversion. 2/ 300
Colonna's Shipyard Inc. Norfolk, Va.	300 x 40 360 x 65	MR MR	<u>900</u> 2200		1/ General ship repairs. 2/ 135
Detyens Shipyards Mt. Pleasant, S.C.	560 x 82 305 x 87	FD FD	<u>300</u> 600		1/ General ship repairs. 2/ 460
Jacksonville Shipyards Jacksonville, Fla.	(2) 530 x 83 600 x 90 900 x 140 500 x 53	FD FD* FD FD*	<u>680</u> 4184		1/ Ship repairs and conversion. Construction of small vessels. 2/ 2,350  *Leased from Navy
Munro Drydock Inc. Chelsea, Mass.	350 x 60	MR	<u>300</u> 955		1/ General ship repairs. 2/ 40
Norfolk SB & DD Corp, Norfolk, Va.	670 x 84 316 x 60 441 x 64	FD FD MR	<u>1420</u> 10172		1/ Ship repairs and conversion. Construction of small vessels. 2/ 2,060

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

Name and location	Maximum Ship Size (LOA--Beam)		Berths/Piers		Remarks
	SW--Shipway	GD--Graving Drydock	Usable length in feet	Longest Total linear feet	
Perth Amboy DD Co. Perth Amboy, N.J.	400 x 68	FD	<u>400</u> 2130		1/ Ship repairs and conversion. 2/ 200
Puerto Rico DD & Marine Terminals San Juan, P.R.	644 x 81	GD	<u>1000</u> 1000		1/ Ship repairs. 2/ 125 Leases Naval Industrial Reserve Shipyard.
Rodermond Industries Jersey City, N.J.	360 x 58	FD	<u>842</u> 842		1/ Ship repairs. 2/ 130
Savannah Machine and Shipyard Co. Savannah, Ga.	532 x 64	GD	<u>382</u> 1563		1/ Ship repairs and conversion. 2/ 400
Todd Shipyards Corp. Brooklyn, N.Y.	700 x 85 622 x 92 755 x 95	GD FD FD	<u>1152</u> 7653		1/ Ship repairs and conversion. 2/ 460
Tracor Marine, Inc. Port Everglades, Fla.	360 x 80 (Syncrolift with 400' transfer system)		<u>1080</u> 1880		1/ Ship repairs. 2/ 330
<u>GULF COAST</u> <u>SHIPBUILDING YARDS</u>					
Alabama DD & SB Co. Mobile, Ala.	(3) 523 x 68 620 x 90 620 x 83 750 x 100 380 x 70	SW SW FD FD FD	<u>1132</u> 9370		1/ Ship construction, conversion, and repairs. Also drill rig construction. 2/ 3,730

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

Name and location	Maximum Ship Size (LOA--Beam)		Berths/Piers		Remarks
	SW--Shipway		Usable length in feet	Longest Total linear feet	
Avondale Shipyards, Inc. New Orleans, La.	*(2) 960 x 176 **1200 x 130 378 x 68 300 x 50 1000 x 216	SW SW FD MR FD	1625 3565		1/ Ship construction, conversion and repairs. Also drill rig construction.  2/ 6,300  *Two vessels up to 960' x 176' can be constructed simultaneously.  **Three vessels can be in different stages of construction simultaneously (or up to 6 vessels if total lengths of each pair do not exceed 1200').
Beth. Steel Corp. Beaumont, Tex.	842 x 96 650 x 83	SW FD	1100 4050		1/ Construction of barges and drilling rigs. Also ship repairs and conversion.  2/ 1,320
Ingalls SB Division Litton Industries Pascagoula, Miss.	690 x 85 550 x 80 (4) 650 x 90 480 x 70 *820 x 176	SW SW SW GD FD	2650 8090		1/ Construction, conversion, overhaul - all types of vessels.  2/ 23,760  *West Bank can launch ship up to 820' x 176'. Equivalent of six conventional inclined ways in terms of ships delivered annually.
Galveston SB Co. Galveston, Tex.	700 x 100	SW	None*		1/ Construction of barges, tugs, and oceangoing integrated tug/barge units.  2/ 400  *City wharf in Galveston is available.
Levingston SB Co. Orange, Tex.	1100 x 90 350 x 60 420 x 120	SW FD FD	520 2430		1/ Construction of offshore drilling rigs and drill ships. Yard has capability of building large oceangoing ships.  2/ 2,010



MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

Name and location	Maximum Ship Size (LOA--Beam)		Berths/Piers		Remarks
	SW--Shipway GD--Graving Drydock FD--Floating Drydock MR--Marine Railway		Usable length in feet	Longest Total linear feet	
Marathon LeTourneau Co. Gulf Marine Division Brownsville, Tex.	1100 x 150	SW	<u>500</u> 500		1/ Construction of offshore drilling rigs and drill ships. Yard has capability of building large oceangoing ships.  2/ 1,100
Tampa Ship Repair & DD Co. Tampa, Fla.	600 x 150 550 x 75	SW GD	<u>1200</u> 2700		1/ Ship construction and repairs.  2/ 700
<u>GULF COAST</u>  <u>REPAIR YARDS WITH DRYDOCK FACILITIES</u>					
Bender Welding & Machine Co. Mobile, Ala.	414 x 55	FD	<u>617</u> 1667		1/ Ship repairs and construction up to 200' long.  2/ 295
Gulf-Tampa Drydock Co. Tampa, Fla.	300 x 48	FD	<u>550</u> 550		1/ Construction and repair of small vessels.  2/ 240
Southern SB Corp. Slidell, La.	350 x 54	GD	<u>200</u> 300		1/ Construction and repair of vessels up to 350' in length and not drawing over 15' of water.  2/ 325
Todd Shipyards Corp. Galveston, Tex.	670 x 86	FD	<u>1086</u> 5035		1/ Ship repairs and conversion. Also nuclear-related work.  2/ 1,025

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

Name and location	Maximum Ship Size (LOA--Beam)		Berths/Piers		Remarks
	SW--Shipway		Usable length in feet	Longest Total linear feet	
Todd Shipyards Corp. Houston, Tex.	600 x 95 600 x 96	SW FD	1844 3271		1/ Ship repairs and conversion. Construction of barges and vessels up to 600' in length.  2/ 588
Todd Shipyards Corp. New Orleans, La.	696 x 86 628 x 80	FD FD	1725 4956		1/ Ship repairs and conversion.  2/ 400
<u>WEST COAST</u>					
<u>SHIPBUILDING YARDS</u>					
Beth. Steel Corp. San Francisco, Calif.	550 x 90 700 x 94 950 x 144	SW FD FD	813 3200		1/ Ship repairs and conversion. Can build C3 and C4 type vessels.  2/ 750
FMC Corp. Portland, Ore.	700 x 100	SW	600 600		1/ Construction of vessels up to 700' in length.  2/ 2,000  Leases drydocks and berths from Port of Portland as required.
Lockheed SB & Construction Co. Seattle, Wash.	650 x 95 650 x 90 700 x 100 400 x 46 530 x 80 600 x 96	SW SW SW FD FD FD	800 6500		1/ Ship construction, conversion and repairs.  2/ 1,700
National Steel and SB Co. San Diego, Calif.	996 x 170 700 x 90 (2) 900 x 106 350 x 60 687 x 90	GD SW SW FD GD*	950 9470		1/ Construction, conversion and repairs - all types of vessels.  2/ 6,300  *Leased from Unified Port District of San Diego.

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

Name and location	Maximum Ship Size (LOA--Beam)		Berths/Piers Usable length in feet	Remarks
	SW--Shipway	FD--Floating Drydock		
Todd Shipyards Corp. San Pedro, Calif.	(2) 800 x 84 563 x 82 665 x 83	SW FD FD	680 4800	1/ Construction, repairs and conversion - all types of vessels. 2/ 2,035
Todd Shipyards Corp. Seattle, Wash.	550 x 96 650 x 83 420 x 62 550 x 88	SW FD FD FD	1137 4850	1/ Ship construction, repairs and conversion. 2/ 400
<u>WEST COAST</u>				
<u>REPAIR YARDS WITH DRYDOCK FACILITIES</u>				
Dillingham Marine & Mfg. Co. (formerly Albina Eng. & Machine Works) Portland, Ore.				1/ Ship repairs and conversion. 2/ 321  Leases drydocks and berths from Port of Portland as required.
Beth. Steel Corp. San Pedro Yard Terminal Island, Calif.	500 x 86 720 x 94	FD FD	1800 4175	1/ Ship repairs and conversion. 2/ 688
Calif. SB & DD Co. Long Beach, Calif.	320 x 68	FD	600 1700	1/ Ship repairs and conversion. 2/ 230
Campbell Industries Marine Division San Diego, Calif.	(2) 410 x 54	FD	575 1975	1/ Construction of fishing boats and ferry boats. Also ship repairs. 2/ 950  Graving dock is leased from Unified Port District of San Diego. (Listed under NASSCO)

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

Name and location	Maximum Ship Size (LOA--Beam) SW--Shipway GD--Graving Drydock FD--Floating Drydock MR--Marine Railway	Berths/Piers		Remarks
		Usable length in feet	Longest Total linear feet	
Dillingham Shipyard Honolulu, Hawaii	370 x 54 FD	<u>550</u> 750		1/ Ship repairs and conversion. 2/ 248
Lake Union DD Co. Seattle, Wash.	340 x 52 FD	<u>1000</u> 4235		1/ Ship repairs and conversion. 2/ 114
Merritt Ship Repair Co. Oakland, Calif.	350 x 50 FD	<u>600</u> 1155		1/ Ship and barge repairs. 2/ 60
Northwest Marine Iron Works Portland, Ore.	500 x 100 SW (Barge construction only)			1/ Ship repairs, conversion and barge construction. 2/ 600  Leases drydocks and berths from Port of Portland as required.
Port of Portland Swan Island Ship Repair Yard Portland, Ore.	633 x 85 FD 525 x 88 FD 810 x 105 FD	<u>750</u> 6360		Port of Portland owns these drydocks which are leased to ship repair companies on an as-required basis.
San Diego Marine Construction Corporation San Diego, Calif.	380 x 80 FD	<u>700</u> 1855		1/ Construction of ships, boats and barges up to 200' in length. Also repairs. 2/ 666
Todd Shipyards Corp. San Francisco Division Alameda, Calif.	523 x 80 FD 900 x 136 FD	<u>800</u> 2485		1/ Ship repairs and conversion. 2/ 650

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

Name and location	Maximum Ship Size (LOA--Beam) SW--Shipway GD--Graving Drydock FD--Floating Drydock MR--Marine Railway	Berths/Piers Usable length in feet  Longest Total linear feet	Remarks
Triple A Machine Shop San Francisco, Calif.	740 x 85 GD 1005 x 110 GD 1092 x 139 GD (2) 420 x 56 GD* 420 x 71 GD*	N.A.	1/ Ship repairs and construction up to 420' long. 2/ 850 *Used for construction.  All graving docks are part of the inactive Hunter's Point Naval Shipyard and are leased from U.S. Navy.
Willamette Iron & Steel Co. Portland, Ore.		1232 1232	1/ Ship repairs and conversion. 2/ 1200  Leases crydocks and berths from Port of Portland as required.
Willamette Iron & Steel Co. Richmond, Calif.	744 x 80 GD 583 x 80 GD (3) 570 x 80 GD	1560 1560	1/ Ship repairs and conversion. 2/ 500
<u>GREAT LAKES</u>			
<u>SHIPBUILDING YARDS</u>			
(Maximum size ship that can exit St. Lawrence Seaway locks is 730' x 78')			
American SB Co. Lorain, Ohio	700 x 75 SW 705 x 78 GD 1021 x 121 GD	900 1825	1/ Ship construction, repairs and conversion. 2/ 800
American SB Co. Toledo, Ohio	634 x 78 GD 529 x 68 GD	800 1610	1/ Ship construction, repairs and conversion. 2/ 350

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES

Name and location	Maximum Ship Size (LOA--Beam) SW--Shipway GD--Graving Drydock FD--Floating Drydock MR--Marine Railway	Berths/Piers Usable length in feet  Longest Total linear feet	Remarks
Bay SB Corp. Sturgeon Bay, Wis.	750 x 105 SW 600 x 80 SW 400 x 70 SW 650 x 66 FD 1146 x 136 GD*	<u>820</u> 7090	<u>1/</u> Ship construction, conversion and repairs.  <u>2/</u> 1,200  *Scheduled completion December '76.
Defoe SB Co. Bay City, Mich.	900 x 92 600 x 60	<u>1200</u> 2756	<u>1/</u> Ship construction, conversion and repairs.  <u>2/</u> 230
Fraser Shipyards Superior, Wis.	825 x 76 GD 621 x 56 GD	<u>900</u> 4450	<u>1/</u> Ship construction, conversion and repairs.  <u>2/</u> 200
<u>GREAT LAKES</u> <u>REPAIR YARDS WITH DRYDOCK FACILITIES</u>			
American SB Co. Chicago, Ill.	694 x 73 GD	<u>850</u> 1300	<u>1/</u> Ship repairs and conversion.  <u>2/</u> 120
Peterson Builders Sturgeon Bay, Wis.	342 x 30 FD	<u>550</u> 2515	<u>1/</u> Construction and repair of ships and boats.  <u>2/</u> 470

APPENDIX C

MAJOR TOPSIDE REPAIR FACILITIES

SHIPS 300 FEET IN LENGTH AND OVER

MAJOR TOPSIDE REPAIR FACILITIES, SHIPS 300 FEET  
IN LENGTH AND OVER

EAST COAST

Ardell Marine Corporation  
Brooklyn, New York

American Ship Repairs Co., Inc.  
Brooklyn, New York

Arnessen Electric Company, Inc.  
Brooklyn, New York

Atlantic Marine, Inc.  
Fort George Island, Fla.

Atlantic Repair Co., Inc.  
Brooklyn, New York

Auto Marine Sales Corp.  
Ft. Lauderdale, Fla.

Banks Ship Rigging Corporation  
Brooklyn, New York

Berkley Shipbuilding & Drydock Corp.  
Norfolk, Virginia

Braswell Shipyards, Inc.  
Mt. Pleasant, S.C.

Caddell Dry Dock & Repair Co.  
Staten Island, New York

Cardinal Engine & Boiler Works, Inc.  
Brooklyn, New York

Carolina Marine & Drydock Co.  
Wilmington, N.C.

Consolidated Service Inc. of Charleston  
Charleston, S.C.

Diesel Injection Sales & Service  
Norfolk, Virginia

Electric Motor and Contracting Co.  
Norfolk, Virginia

General Ship & Engine Works, Inc.  
East Boston, Mass.

General Ship Repair Corporation  
Baltimore, Maryland

Horne Brothers, Inc.  
Newport News, Virginia

Hudson Engineering Company  
Hoboken, New Jersey

Industrial Welding & Machine, Inc.  
Portland, Maine

J-Y Industrial Corporation  
Brooklyn, New York

Kurt's Marine Diesel, Inc.  
Ft. Lauderdale, Fla.

Marine Contractors Co., Inc.  
East Boston, Mass.

Marine Electric Corporation  
Brooklyn, New York

Merrill-Stevens DD Company  
Miami, Florida

Metro Machine Corporation  
Norfolk, Virginia

A. Moe & Co., Inc.  
Philadelphia, Pennsylvania

Moon Engineering Company, Inc.  
Norfolk, Virginia



Newport Ship Yard, Inc.  
Newport, Rhode Island

Nordic Diesel & Machine Co., Inc.  
Brooklyn, New York

Norlantic Diesel, Inc.  
Fairhaven, Mass.

Port Marine Company, Inc.  
Ft. Lauderdale, Fla.

Promet Corporation  
East Providence, R.I.

Reynolds Shipyard Corporation  
Staten Island, New York

Rollinson Electric Contractors, Inc.  
Savannah, Georgia

Sandblasters, Inc.  
Charleston, S.C.

Seahol Contracting Company  
Charleston, S.C.

South Portland Shipyard & Marine  
Railway Corp.  
South Portland, Maine

Stephen Ransom, Inc.  
Port Newark, New Jersey

Surless Ship Repair Corporation  
Brooklyn, New York

Thames Shipyard & Repair Co.  
New London, Conn.

Tickle Engineering Works, Inc.  
Brooklyn, New York

Williams Brothers  
Division of Gowen, Inc.  
Portland, Maine

Williams & Manchester Shipyard  
Newport, R.I.

Wilmington Iron Works, Inc.  
Wilmington, North Carolina

#### GULF COAST

American Marine Corporation  
New Orleans, La.

Bludworth Shipyard, Inc.  
Houston, Texas

Boland Marine and Mfg. Co.  
New Orleans, La.

Buck Kreihls Co., Inc.  
New Orleans, La.

Coastal Iron Works, Inc.  
Corpus Christi, Texas

Coastal Marine Service of Texas, Inc.  
Port Arthur, Texas

Dixie Machine Welding & Metal Works  
New Orleans, La.

Farmer's Marine Copper Works, Inc.  
Galveston, Texas

J. A. Gerrets, Inc.  
New Orleans, La.

Hahn & Clay  
Houston, Texas

Harrisburg Machine Co., Inc.  
Houston, Texas

Hendry Corporation  
Tampa, Florida

Lone Star Marine Salvage Co.  
Houston, Texas

Marine Repairs, Inc.  
Houston, Texas

McDonough Iron Works  
Galveston, Texas

Runyan Machine & Boiler Works, Inc.  
Pensacola, Florida

Saucer Marine Service, Inc.  
New Orleans, Louisiana

Sherman Shipyard  
Panama City, Fla.

Slocum Iron Works, Inc.  
Mobile, Ala.

WEST COAST

Cavanaugh Machine Works  
Wilmington, California

Coastal Marine Engineering Co.  
San Francisco, Calif.

Colberg, Inc.  
Stockton, California

Dockside Machine and Ship Repair  
Wilmington, California

Duwamish Shipyard, Inc.  
Seattle, Washington

Electro-Mechanical Co.  
Portland, Oregon

Ets-Hokin & Galvan Electric Co.  
San Diego, California

Franklin Machine Works, Inc.  
San Francisco, California

Fulton Shipyard  
Antioch, California

General Engineering & Machine Works  
San Francisco, California

Marine Iron Works, Shipyard Division  
Tacoma, Washington

Marine Power & Equipment Co.  
Seattle, Wash.

Pacific Dry Dock & Repair Co.  
Oakland, Calif.

Pacific Marine & Supply Co.  
Honolulu, Hawaii

Plant Bros. Corp.  
San Francisco, California

Port Welding & Machine Works, Inc.  
Wilmington, California

Rowe Machine Works, Inc.  
Seattle, Washington

Service Engineering Company  
San Francisco, California

Tacoma Boatbuilding Co., Inc.  
Tacoma, Washington

Triple A South  
San Diego, California

West Winds, Inc.  
San Francisco, California

Wilmington Iron Works  
Wilmington, California

Wilmington Welding & Boiler Works  
Wilmington, California

GREAT LAKES

Advance Boiler & Tank Company  
Milwaukee, Wisconsin

G. W. Industries, Inc.  
Cleveland, Ohio

Hans Hansen Welding Co., Inc.  
Toledo, Ohio

Lower Lake Dock Company  
Sandusky, Ohio

Niagara Industries, Inc.  
Erie, Pennsylvania

Nicholson & Hall Corporation  
Buffalo, New York

Nicholson Terminal & Dock Co.  
River Rouge, Michigan

Oldman Boiler Works, Inc.  
Buffalo, New York

Perry Shipbuilding Corp.  
Erie, Pennsylvania

Pittsburgh & Conneaut Dock Company  
Conneaut, Ohio

Soo Drydock Company  
Sault Ste. Marie, Michigan

William Ferrel, Inc.  
Toledo, Ohio

1900

1900