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of Transportation

Maritime
Administration

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

1990

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REPORT ON SURVEY OF U.S.
SHIPBUILDING AND REPAIR FACILITIES
1990

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Office of Ship Construction
Division of Production
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Introduction

In compliance with the Merchant Marine Act of 1936, as amended, 1/ the Maritime Administration (MARAD) conducts an annual survey to obtain information from the shipbuilding and ship repair industry to be used primarily to determine if an adequate mobilization base exists for national defense and for use in a national emergency. This report on the 1990 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 and other Government agencies.

1/ Section 210

"It shall be the duty of the Secretary of Transportation 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 the Act, and the Secretary of Transportation 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 Transportation 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 enactment of this Act or thereafter built in the United States."

Section 502(f)

"The Secretary of Transportation with the advice of and in coordination with the Secretary of the Navy, shall, at least once a 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."

The statistical data accumulated by the survey is a major input into the Shipyard Evaluation Analysis System Model (SEAS), 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 assess the adequacy of the shipbuilding mobilization base, including ship repair and 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 be also identified. The data gathered by the annual survey also is used extensively in MARAD responses to queries received from a variety of interests, including members of Congress, the Secretary of Transportation, the Department of Defense, the Office of Management and Budget, and other Government agencies.

Each year in late spring, Standard Form 17, "Facilities Available for the Construction or Repair of Ships," is mailed to some 350 U.S. 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, which is not available from any other source on a continuing and structured basis. The information requested, and available for official use, can be reviewed on a blank Form 17 shown herein as Appendix A. A graving dock characteristics summary and floating drydock characteristics summary are appended to Standard Form 17 to better identify the characteristics of the facilities.

Upon receipt of a completed Form 17 from a shipyard, MARAD forwards a copy to the Office of the Coordinator for Ship Repair and Conversion, which maintains records of available facilities and capacities of various shipyards and repair plants. This would enable the Department of Transportation and the Department of Defense to use such facilities to the best advantage in the event of national emergency.

The annual shipyard survey of 1990 has been completed. The information collected has been organized and condensed in the following narratives, exhibits, and tabulations to focus attention on those elements that are most often requested from this office.

GENERAL

A major shipbuilding and repair facility is defined in this report as one that is open and has the capability to construct, drydock, and/or topside repair vessels with a minimum length overall of 400 feet (122 m), provided that water depth in the channel to the facility is at least 12 feet (4 m). Appendix B is a statistical abstract of data gathered from 106 companies responding to MARAD's annual survey which meet this criteria. It lists the facilities sorted on a coastal basis and displays information with respect to the size and type of each building position, drydock, berth space, employment, and remarks regarding principal shipyard activities.

Table 1 has been prepared to answer the frequent question as to the number of shipbuilding positions available to build a complete specified ship. With the exception of the mobilization ship, the ship types listed in Table 1 are those historically delivered to commercial service. Length overall and beam are given for all ships and, in addition, deadweight tonnage is indicated for the bulk carriers. 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 198-foot (366 m by 60 m) basin at Bethlehem's Baltimore Marine Division shipyard can accommodate one 265,000-dwt. tanker or four of the smaller general cargo ships. The total number of building positions varies from 81 for the small cargo ship to three for a huge 265,000-dwt. tanker. An important consideration that is not addressed in Table 1 is the common shipbuilding practice of laying a keel on a building position already occupied by another ship. For example, in a 700-foot (213 m) basin, a complete 610-foot (186 m) containership and the stern section of a second ship could be constructed simultaneously. This production procedure 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 1 addresses only the number of complete ships that can be constructed simultaneously in each building position(s).

Table 2 is a somewhat different presentation of shipyard capability. 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 Bethlehem's Baltimore Marine Division as an example, Table 2 lists the 1,200-foot by 198-foot (366 m by 60 m) basin as one facility regardless of what type of ship is constructed in it. Table 1 indicates that there are six building positions for a ship 475 feet (145 m) LOA at the Baltimore Marine Division, whereas Table 2 indicates that the yard has three individual building positions capable of constructing a ship about that length. Exhibit 20 is a histogram displaying the reduction in the number of available shipways as the maximum ship length increases.

MAJOR SHIPBUILDING FACILITIES

The following is a brief description of 18 of the major U.S. privately-owned shipbuilding facilities. Exhibits 1 through 18 are general arrangement plans of each yard's facilities. Exhibit 19 illustrates the geographical location of these 18 shipyards in addition to the General Dynamics Corporation's Electric Boat Division which, although a major privately-owned shipyard, is engaged exclusively in construction of submarines for the U.S. Navy.

DESCRIPTIONS AND GENERAL ARRANGEMENT PLANS

FOR

18 MAJOR U.S. SHIPBUILDING FACILITIES

1. Alabama Shipyard, Inc.

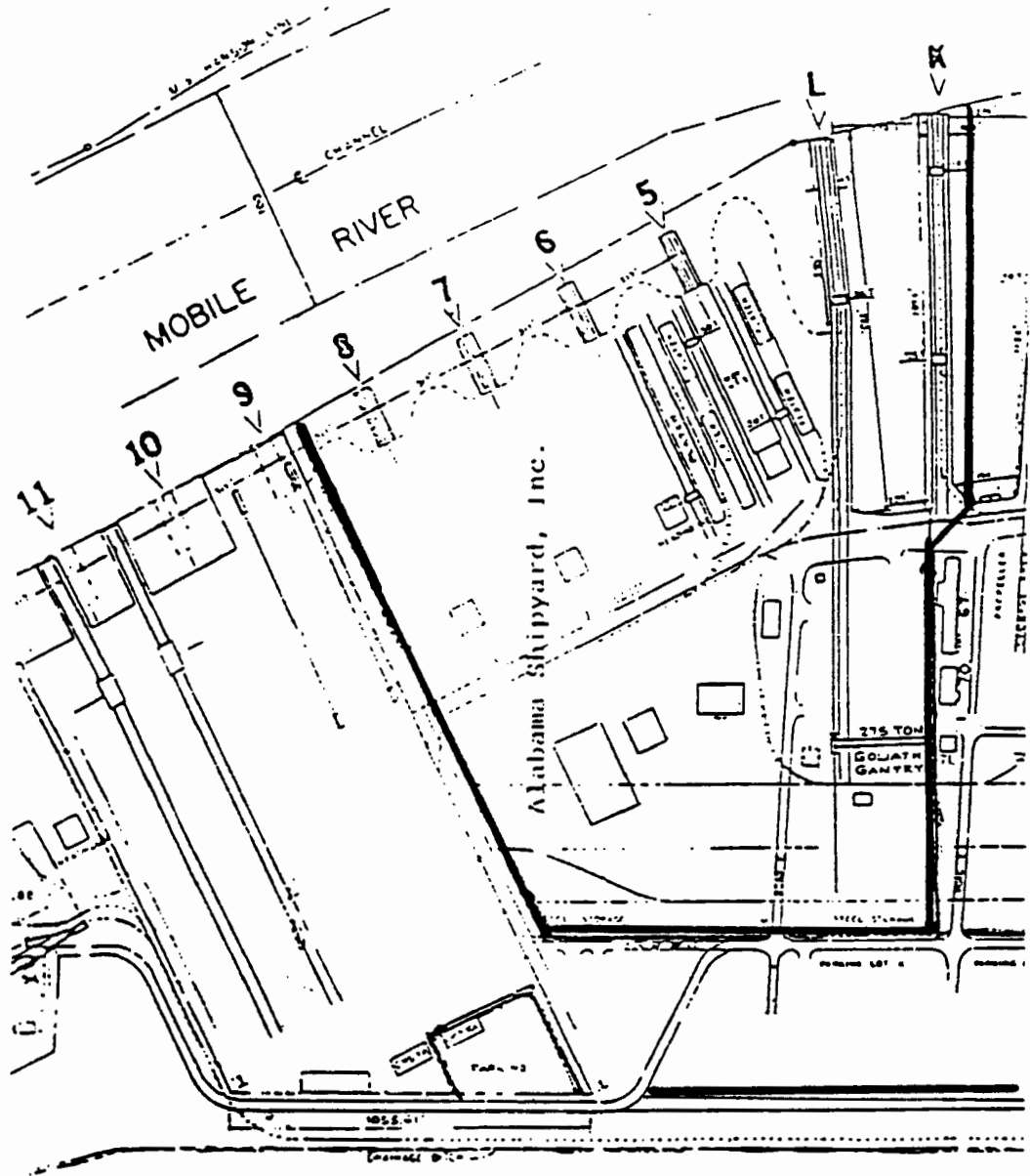
Alabama Shipyard, Inc., is a wholly-owned subsidiary of Atlantic Marine Holding Company of Jacksonville, Florida. Alabama Shipyard, Inc., (formerly ADDSCO's Alabama Maritime Corporation), is a new construction facility specializing in both marine and industrial fabrication. The shipyard is located on the Mobile River, across the river from Mobile, Alabama, about 30 miles from the Gulf of Mexico. Acquired by Atlantic Marine in 1989, the yard has been in existence since 1916 and has constructed a variety of ships (both commercial and naval), barges and drill ships.

As of October 1, 1990, work underway at Alabama Shipyard included construction of five crane mounted barges, two aircraft lighter barges and one floating steam boiler barge, all for the U.S. Navy. In addition, Alabama Shipyard had a contract to construct one passenger/vehicle ferry for the State of Texas.

Alabama Shipyard, Inc., is capable of constructing ships up to a maximum size of 700 feet by 90 feet (213 m by 27 m). The shipyard has 130,000 square feet (12,076 square meters) of manufacturing space, 80,000 square feet (7,432 square meters) of covered warehouse space, two finger piers with total usable pier space of 4,000 feet (1,219 meters), and a 250-metric ton bridge crane. The yard recently installed a 700 foot (213 m) transfer launching system. Various other gantry cranes, as well as a plate shop and a carpenter shop, are utilized for construction. The yard also has access to a twin-boom luffing derrick capable of handling 1,400 metric tons, which can be used for lifting heavy offshore structures.

As of mid-1990, Alabama Shipyard's employment totaled 191, up from 130 a year earlier.

Exhibit 1 is a current general arrangement plan of Alabama Shipyard's facilities.



ALABAMA SHIPYARD, INC.
Mobile, Alabama

2. Avondale Industries, Inc. - Avondale Shipyards Division

Avondale Shipyards Division is located on the west bank of the Mississippi River approximately nine miles upriver from New Orleans, Louisiana. Avondale, previously a wholly-owned subsidiary of Odgen Corporation, was sold in 1985 to its employees in an Employee Stock Ownership Plan (ESOP). Since 1938, Avondale has constructed a full range of Navy and commercial ships, as well as Coast Guard cutters and offshore drilling rigs; and it has the distinction of being the only American shipyard to have constructed LASH vessels.

Avondale also maintains an active repair operation for commercial and naval ships. Inland waterway and offshore oil vessels are repaired by Avondale's Westwego and Harvey Divisions. Offshore platforms, jackets, and production modules are constructed by Avondale's main plant.

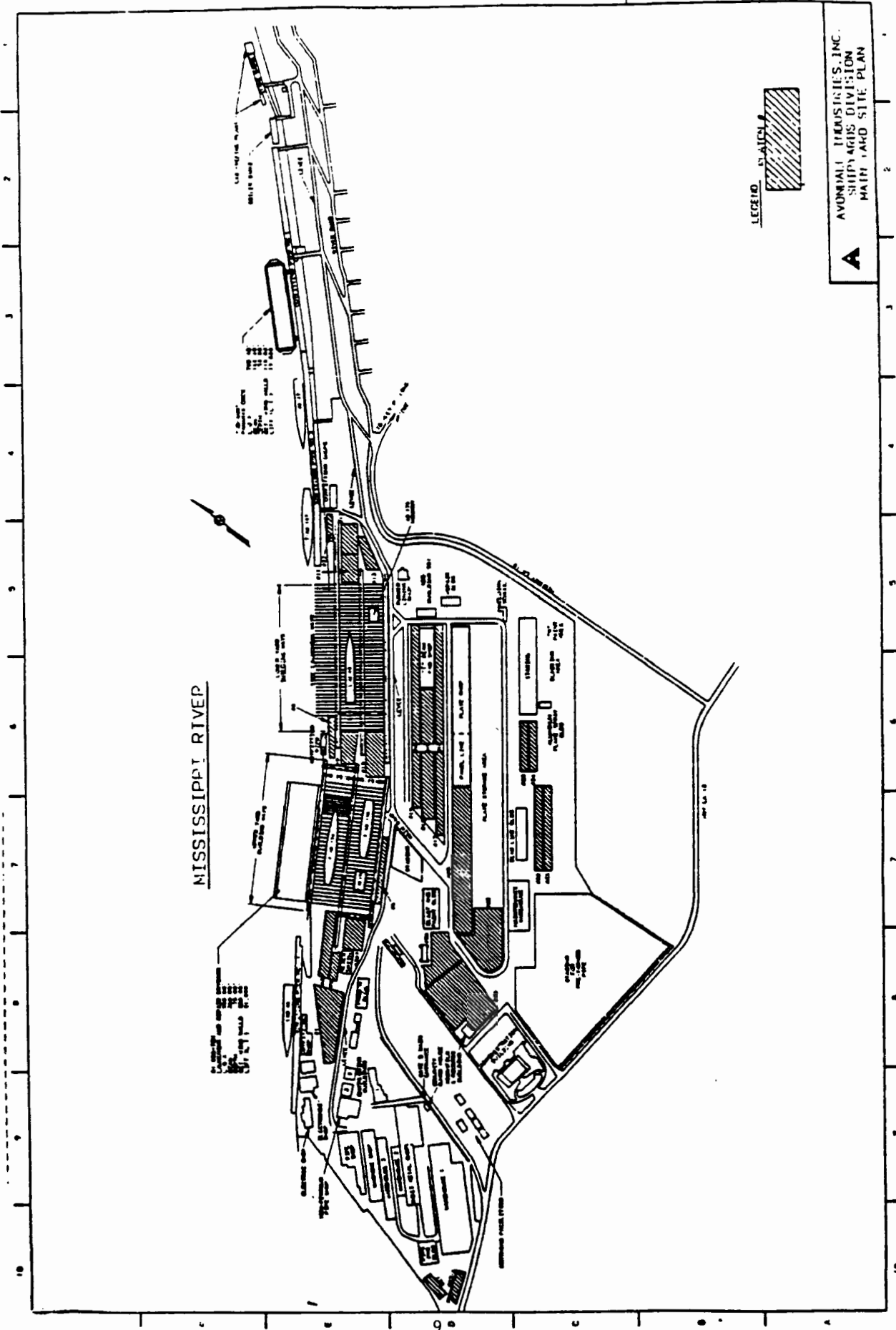
Avondale's new construction orderbook as of October 1, 1990, consisted of one oceanographic survey ship (T-AGS 45), nine fleet oilers (T-AO's) and four dock landing ships (LSD's). In addition, Avondale has contracts for the jumboization of five Navy fleet oilers of the AO-177 class.

Avondale's main yard facility totals 222 acres and contains three outfitting docks equipped with supporting shops and over 6,000 feet (1,829 m) of pier space. Avondale's upper yard shipbuilding area has two large positions to accommodate vessels of up to 1,020 feet (311 m) in length by 175 feet (53 m) beam. The major part of one ship can be erected along with the stern section of a second ship on position No. 1, while a third hull is being completed on position No. 2. Ships constructed in the upper yard move laterally in three positions for launching by Avondale's large floating drydock, which can accommodate ships as large as 1,000 feet by 216 feet (305 m by 66 m), with a lifting capacity of 82,296 metric tons. Avondale's lower yard has a side-launching construction area that has three large positions to accommodate ships as large as 1,200 feet by 126 feet (366 m by 38 m). Ships built in the lower yard move laterally toward the river and parallel to the river in five positions. Up to five large vessels, greater than 700 feet (213 m) LOA, can be constructed simultaneously in the lower yard. A Panamax floating drydock is moored in this area, which can accommodate ships up to 750 feet by 110 feet (229 m by 34 m), and has a lifting capacity of 20,320 metric tons.

Avondale's nearby Westwego, Louisiana, facility is capable of building vessels 450 feet (137 m) long by 90 feet (27 m) beam. In 1988, Avondale long-term leased the ex-Todd Shipbuilding Corporation's New Orleans yard which is now called the Avondale Algiers Division and is used for ship repair, conversion, and overhaul.

In mid-1990, the total employment was about 7,880, a slight increase from last year's 7,780.

Exhibit 2 is a current arrangement plan of Avondale's main plant.



3. Bath Iron Works Corporation

Bath Iron Works Corporation (BIW), a wholly-owned subsidiary of Bath Acquisition Corporation, which is a subsidiary of Bath Holding Corporation, is located on the Kennebec River in Bath, Maine. The small iron foundry which was established on this site in 1826 became Bath Iron Works, Ltd., in 1884, and the first shipbuilding began in 1889. This yard has constructed various type of ships including roll-on/roll-off cargo vessels, containerships, tankers, dredges, barges, and fishing vessels. Bath also has built 212 surface Navy combatants.

BIW was the lead shipbuilder for the Navy's guided missile frigate (FFG-7 class) program and was awarded contracts for the construction of the 24 FFG-7 class frigates. In 1982, the Navy selected BIW as its second source for the high-technology CG 47 class AEGIS cruiser program, awarding the company contracts to build eight of these TICONDEROGA class cruisers - the last of which is scheduled for delivery in 1992. In 1985, BIW was selected as the lead shipbuilder for the design and construction of the Navy's ARLEIGH BURKE class guided missile destroyer (DDG-51) program. Seven DDG's have been ordered from BIW - the last is scheduled for delivery in 1995.

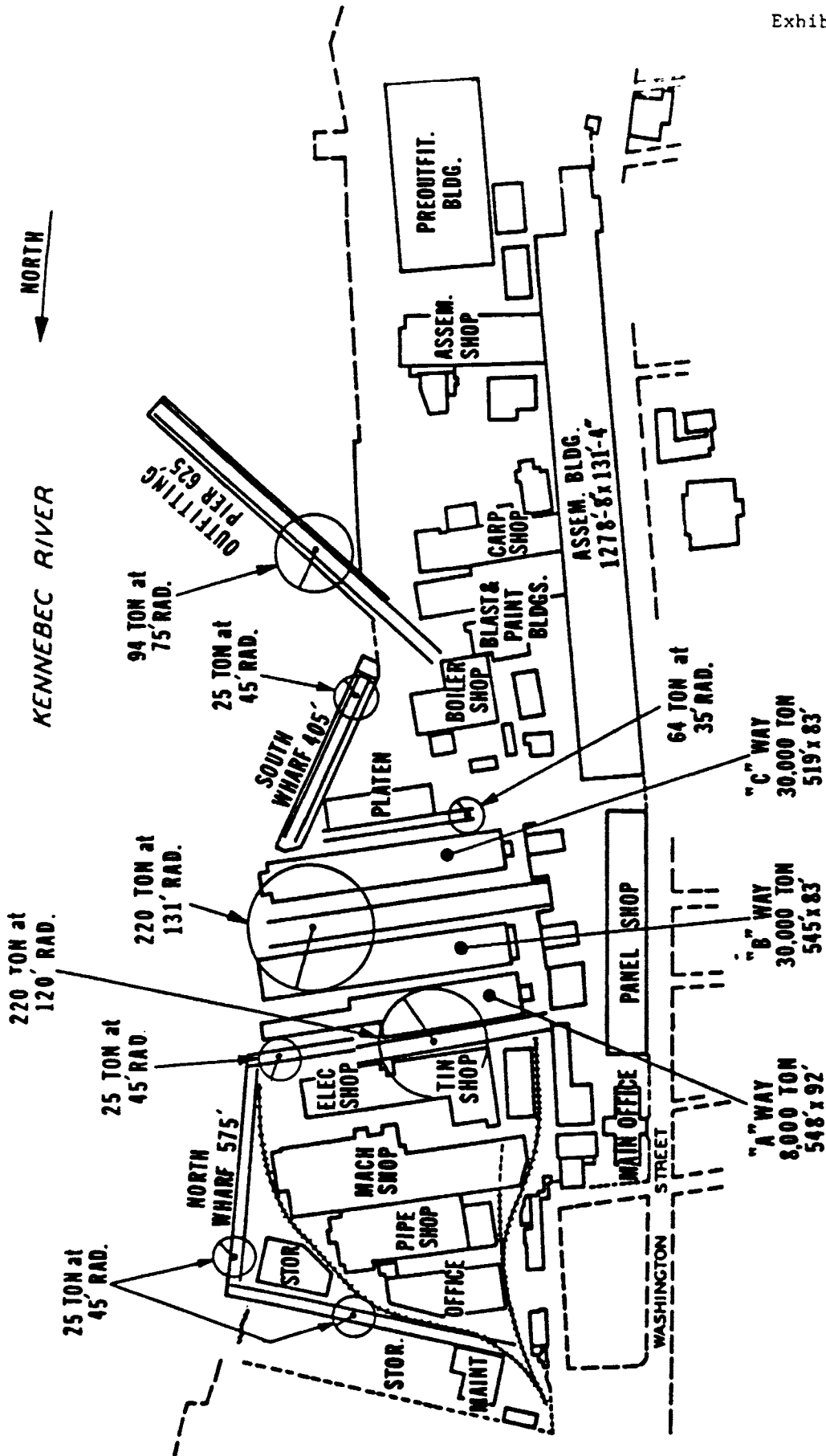
BIW's facilities include two shipways to accommodate ships of 700 feet (213 m) in length with a maximum beam of 130 feet (40 m), or two ships per way with a beam of 54 feet (16 m) each; and a 220 metric ton level-luffing crane with sufficient outreach to erect units on both shipways. The pre-outfit building, opened in 1987, is 200 feet by 410 feet (61 m by 125 m) and has 18 work stations for 219 metric ton erection units. BIW also added a new 220 metric ton capacity revolver crane to serve the third shipway. The shipway can accommodate a ship 650 feet (198 m) in length with a beam of 88 feet (27 m). Two wharves and a pier provide a total of 2,150 linear feet (655 m).

BIW operates two support facilities in West Bath, located three miles (4.8 km) from the main plant. The 33-acre Hardings Fabrication Plant is where the initial steel fabrication takes place. The 113,000 cubic meter consolidated warehouse uses state of the art equipment to accomplish the transfer, handling, and storage of shipbuilding inventory. In 1989, BIW opened its new pipe and sheet metal fabrication facility.

BIW operates the Portland Overhaul and Repair Facility in Portland, Maine. This facility has a large floating drydock with a lifting capacity of 65,000 metric tons, which can accommodate a vessel up to 844 feet by 136 feet (257 m by 41 m). This facility supports new construction programs as the site where sonar dome installations and Post Shakedown Availabilities (PSA's) are performed.

As of mid-1990, the company employed a total of 11,816, compared to 11,370 a year earlier.

Exhibit 3 is a current plot plan of the Bath Iron Works main yard facilities.



BATH IRON WORKS CORP.

4. Bethlehem Steel Corporation - Baltimore Marine Division

Bethlehem's Baltimore Marine Division, Sparrows Point Yard, is located on the Patapsco River in the port of Baltimore, Maryland. Established in 1891, the yard became a 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, 1960's and 1970's, the yard was among the most active in the nation, specializing in series construction of standard size tankers up to VLCCs, freighters, and containerships.

Since the beginning of 1980, the yard has constructed one containership, six integrated tug barge (ITB) tankers, six offshore drilling rigs, two container feeder barges, and two oceanographic survey ships for the U.S. Navy. During this same period, the yard has adapted to changing markets by increasing its efforts in ship conversion and repair, as well as in industrial fabrication. In addition to numerous drydockings and repairs on commercial and Naval ships, three RO/ROs have been converted to Maritime Prepositioning Ships, five RO/ROs have been reflagged, and tunnel sections for a new Interstate 664 Hampton Roads Tunnel Complex have been completed.

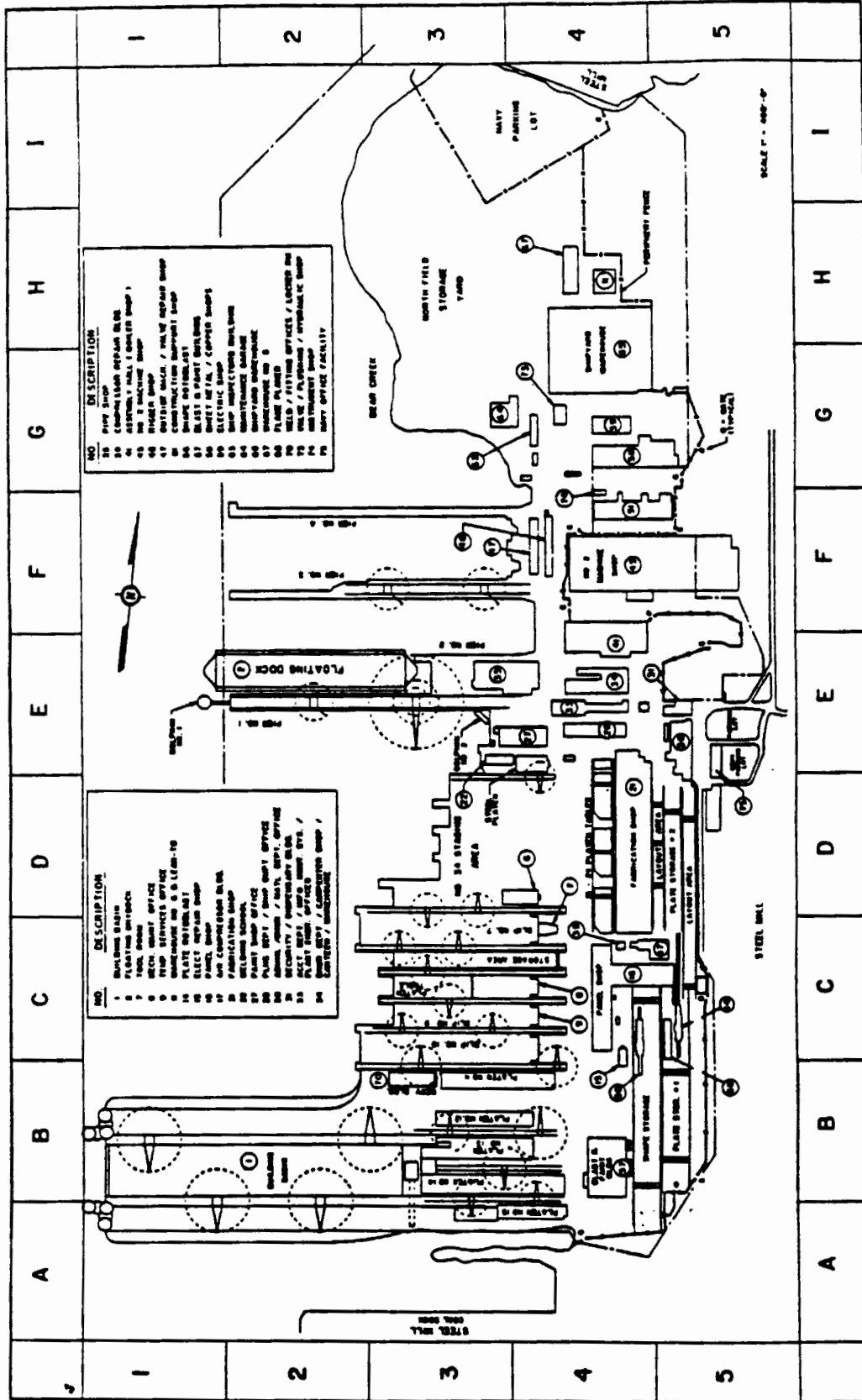
The major component of this shipyard is the building basin (the second largest in the U.S.) for construction of ships as large as 1,196 feet by 194 feet (365 m by 59 m) or up to about 300,000 dwt. A two-position intermediate gate has been installed to increase the flexibility of the basin by dividing it into two sections. In one position the basin's sections are 900 feet and 300 feet (274 m and 91 m) in length. In the second position, the sections are 685 feet and 515 feet (209 m and 157 m) in length.

Complementing the large construction basin, which is served by four tower cranes rated at 91 metric tons maximum each, the shipyard maintains two building ways. Each way can accommodate a maximum ship size of 800 feet by 106 feet (244 m by 32 m). Four outfitting berths are available with a combined length of 3,969 linear feet (1,210 m). The berths are served by five tower cranes with lifting capacities up to 45 metric tons. Several mobile cranes of various capacities are also available.

Baltimore Marine Division also has a floating drydock capable of lifting 44,735 metric tons. The drydock can accommodate vessels up to 900 feet (274 m) in length with a beam of up to 131 feet (40 m) and a draft up to 30 feet (9 m). The entry channel to the yard has a depth of 30 feet (9 m).

The total labor force at the Baltimore Marine Division was 1,107 at mid-1990, down from 1,252 a year earlier.

Exhibit 4 is a current plot plan outlining the company's Baltimore Marine Division.



S.M.D. GENERAL ARRANGEMENT Bethlehem Steel Corporation
Baltimore Marine Division

September, 1988

5. Fraser Shipyards, Incorporated

The Fraser Yard, the only major American shipyard and drydock operation on the western end of the Great Lakes, is located on Howards Bay in Superior, Wisconsin. Since it was founded in the 1890's by Capt. Alexander McDougall, who built 42 of his famous "whaleback" steamers and barges there, this plant has had a succession of owners. From 1900 to 1926, Superior Shipbuilding Company operated the yard and built more than 50 large Great Lakes ore carriers. The yard became a repair facility of the American Ship Building Company from 1926 to 1945 and then became known as Knudsen Brothers Shipbuilding and Dry Dock Company. Fraser-Nelson Shipbuilding and Dry Dock Company took over the plant in 1955, and the present name was adopted in 1964. In August 1977, the yard was sold to Reuben Johnson & Son, Incorporated, a Superior, Wisconsin, contracting and construction firm, but business continues under the Fraser name.

Since World War II, Fraser Shipyards, a complete shipbuilding and ship repair facility, has specialized in vessel repair and ship modernization. In the past 15 years, Fraser has performed most of the major ship lengthening work on the Great Lakes. At this shipyard, general ship repair also has been an important source of revenue.

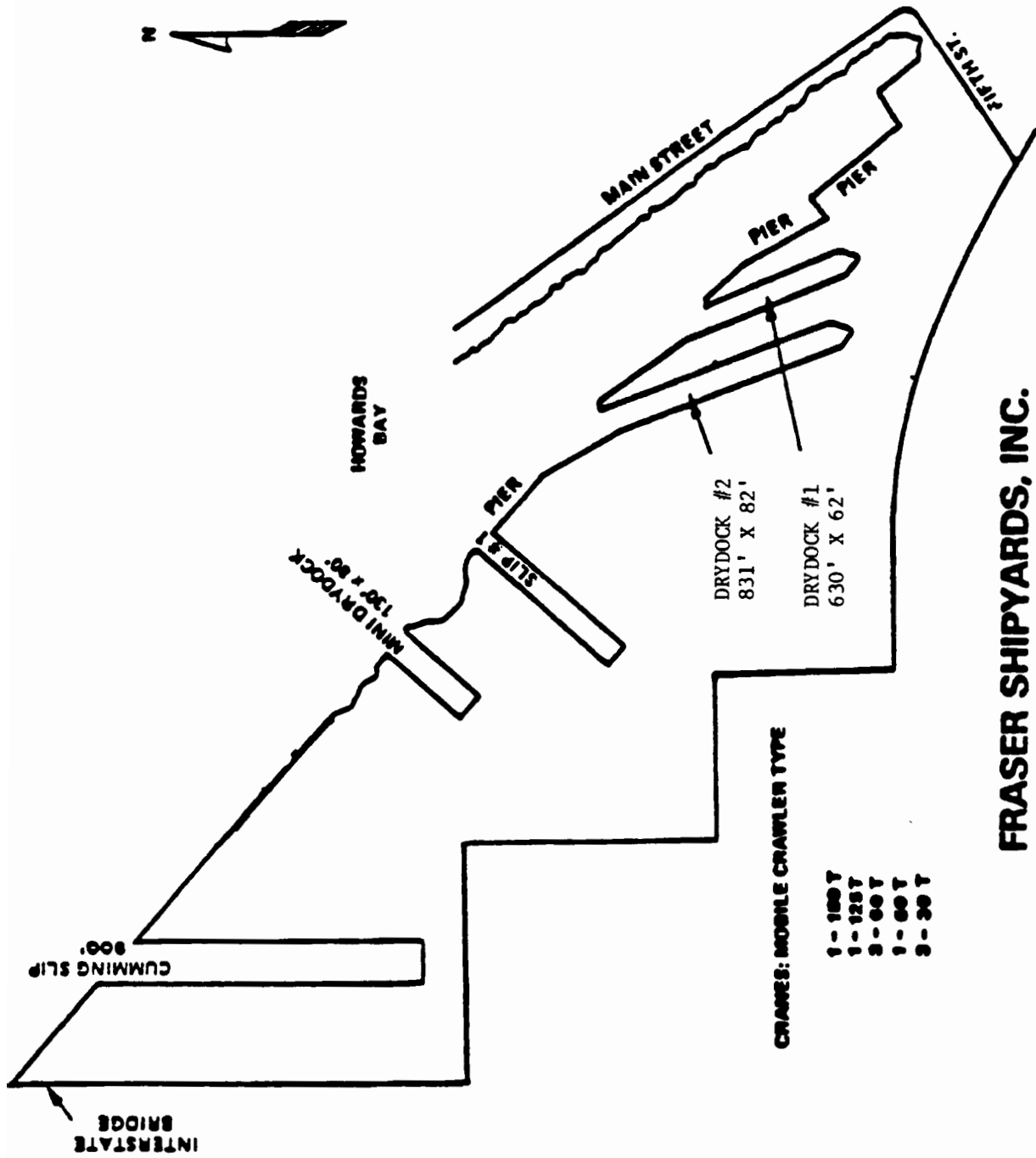
In the early 1980's, the Fraser yard instituted a major renovation of its fabrication capabilities, including a 40 percent increase in its platen table capacity and extension of its railroad trackage to increase steel unloading capabilities by 300 percent. An all-new steel cutting process with hydraulic loading and unloading tables was installed, as well as major repowering of the shipyard to support the expanding facilities and to improve existing capacity. New automated welding equipment and related modern techniques also were introduced to increase productivity. In 1990 Fraser installed a new brake, as well as a new shear.

Fraser maintains two graving docks suitable for ship construction, repair, and conversion work. One basin can accommodate a vessel 825 feet by 82 feet (251 m by 25 m), and the other a vessel 620 feet by 61 feet (189 m by 19 m). A small graving-type dock was added in 1973 to build new midbody sections for the lengthening of bulk-ore freighters under contract at that time. Pierside berthing totals 4,450 feet (1,356 m).

Fraser's 10 mobile cranes, ranging from 14 to 136 metric tons can service all building docks, as well as outfitting and repair berths, and also can be floated on a crane lighter for work afloat. The company also operates an "outside" repair fleet totaling 12 units -- tugs, work launches, and barges -- capable of performing repairs on vessels while they are loading or unloading cargoes in Duluth-Superior harbor and adjacent ports.

In mid-1990, employment was 120 people, helped by the conversion of the LEON FRASER to a cement carrier.

Exhibit 5 is a current plot plan of Fraser's shipbuilding and ship repair facilities.



**FRASER SHIPYARDS, INC.
SUPERIOR, WISCONSIN**

6. Ingalls Shipbuilding Division/Litton Industries, Inc.

The Ingalls Shipbuilding Division of Litton Industries, Inc., is located on the Gulf of Mexico in Pascagoula, Mississippi. Ingalls is a diversified shipbuilding facility experienced in the construction, modernization, conversion, and overhaul of Navy warships and auxiliaries. Since 1975, Ingalls has designed, built and delivered to the Navy 53 major surface combatant ships.

As of October 1, 1990, the company held orders for seven Aegis cruisers -- the last of which is scheduled for delivery in 1994. Other ships under contract were three Ingalls-designed multi-purpose amphibious assault ships (LHDs) for the Navy, as well as six new DDG-51 class guided missile destroyers. In addition, Ingalls has a regular workload of Navy overhauls and repairs. The Ingalls backlog also includes three SAAR corvettes for the Government of Israel.

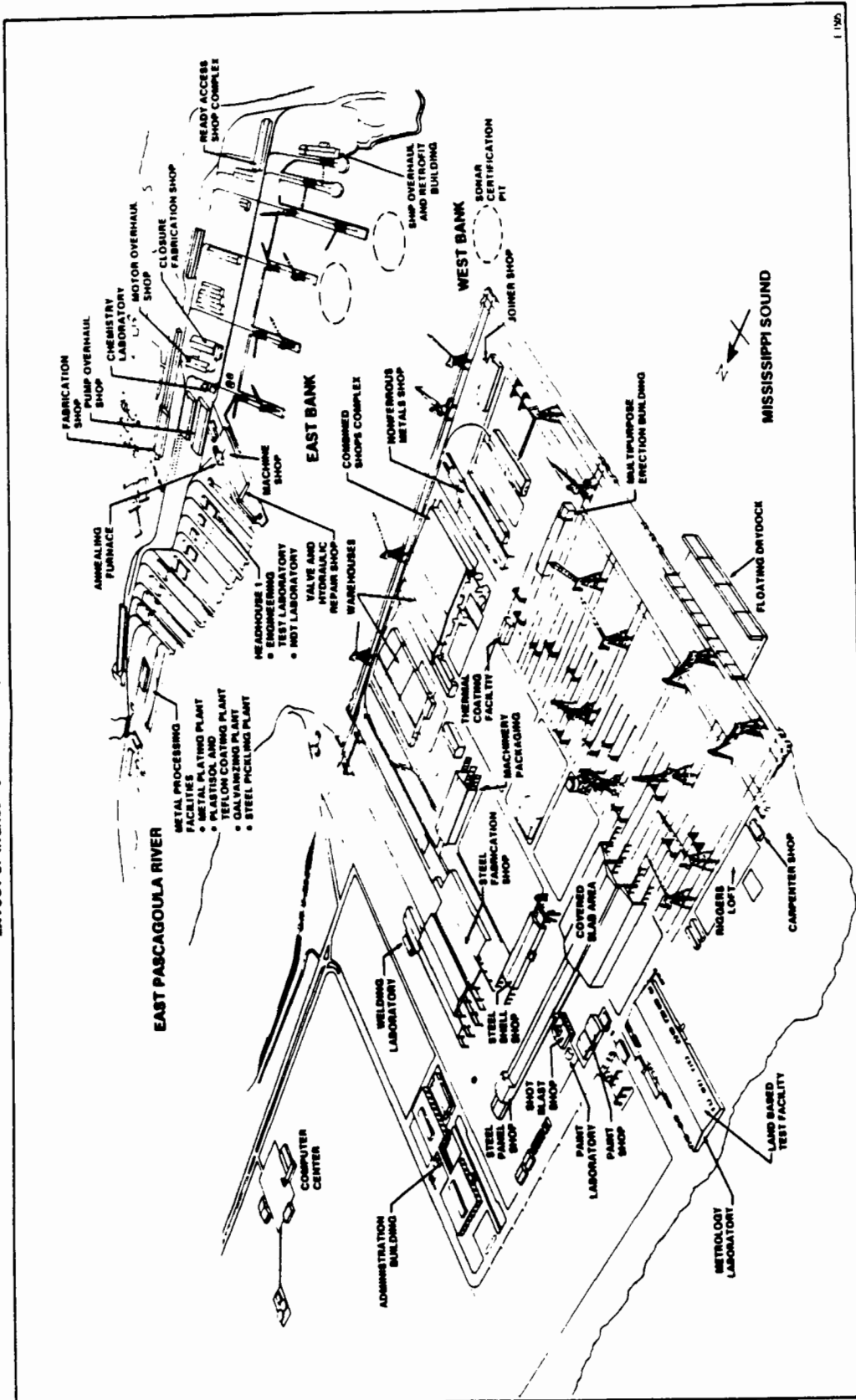
Ingalls 600-acre West Bank facility, completed in 1970, does not have conventional inclined shipbuilding ways but is geared to assembly-line construction. Fabricated steel and subassemblies are brought from the various shops to the subassembly area where they are erected and preoutfitted, then moved to the module assembly area. These areas are divided into five bays, each of which can produce 5,447 metric ton modules. After assembly and outfitting, the modules are moved to the integration area where they are erected into a complete ship. The ship is then moved to a floating drydock (resting on a submerged grid) which is subsequently floated and moved to a deep-water area where it is ballasted and the ship launched. The drydock can launch or recover a maximum ship size of 850 feet by 173 feet (259 m by 53 m). Approximately 4,700 feet (1,432 m) of berthing space, serviced by cranes up to 272 metric tons, are available for outfitting. In August 1988, about 180,000 square feet (16,722 square meters) of the shipyard's slab area was brought under roof to increase the amount of early outfitting performed. Improved pipe production facilities, a machinery packaging facility, and a new blast and paint station in the steel fabrication complex have been added.

Ingalls's older East Bank facility has been in operation since 1938, engaged primarily in the construction of commercial cargo ships and tankers. Although there are six inclined shipways and a graving dock at East Bank, they were all taken out of service in 1989. Refurbishment of these facilities is anticipated to take at least two years. However, a wharf and four piers provide a total of 3,000 feet (914 m) of berthing space serviced by cranes with up to 54 metric tons of capacity for outfitting and topside repair.

Ingalls Shipbuilding Division of Litton Industries at mid-1990 employed a total labor force of 12,987, up from 10,500 a year earlier.

Exhibit 6 is the current general arrangement plan of Ingalls' East Bank and West Bank facilities.

LAYOUT OF INCALLS SHIPBUILDING, INC.



7. Marinette Marine Corporation

Marinette Marine Corporation is a privately-owned Great Lakes shipbuilding company founded during the early months of World War II and located in northeast Wisconsin. During the past 48 years, the yard has built nearly 1,300 vessels, including harbor tugs, research vessels, torpedo weapon retrievers, minehunters and yard patrol craft.

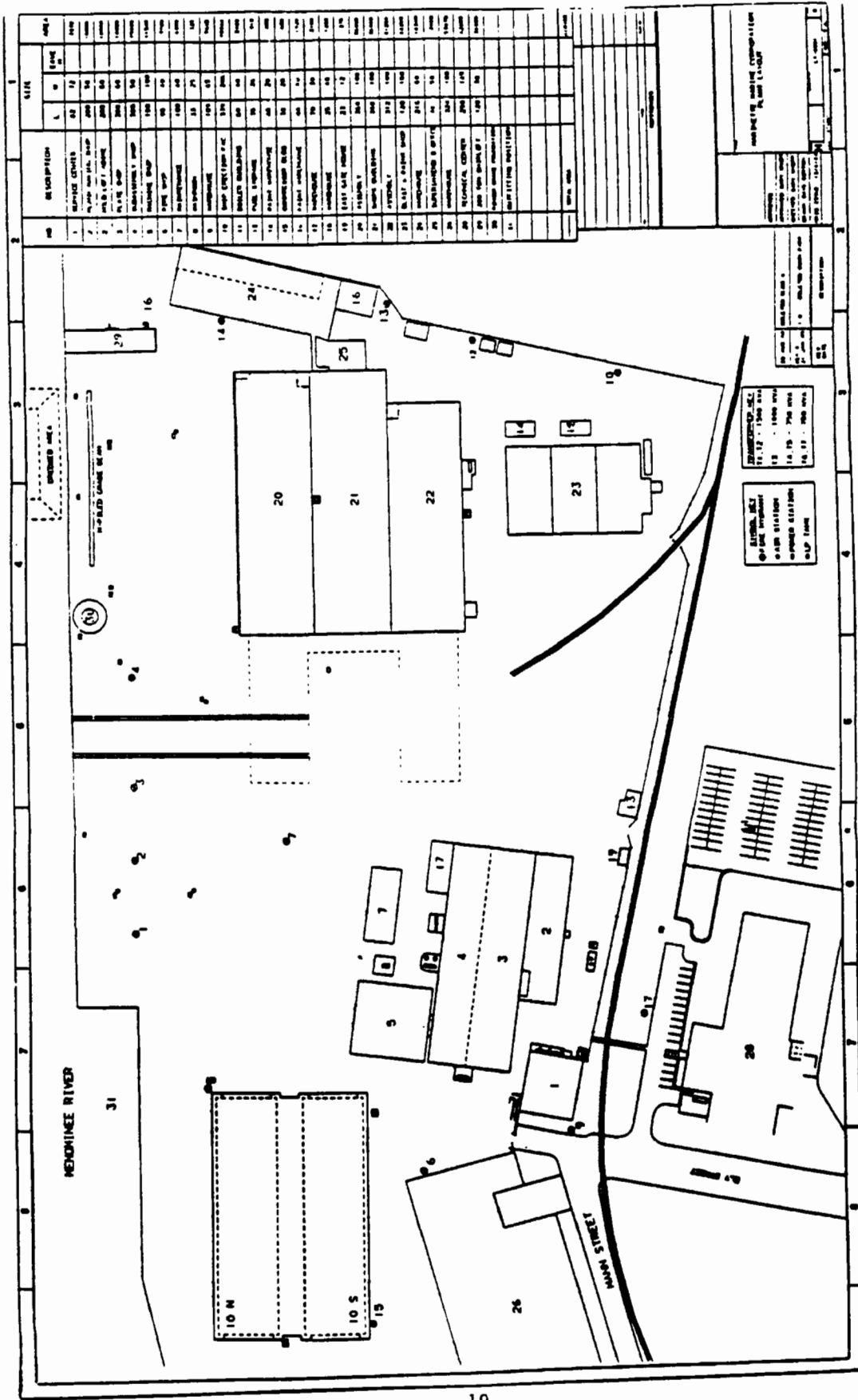
As of October 1, 1990, Marinette Marine was engaged in the construction of two mine countermeasure (MCM) vessels for the Navy -- the last of which is expected to be delivered in June 1991.

The shipyard covers 57 acres and has over 134,146 square meters of enclosed workspace permitting year-round, uninterrupted construction of vessels up to 400 feet (122 m) in length overall with a beam of up to 65 feet (20 m). Large fabrication shops and erection areas, a 220 metric ton shiplift, three launchways, and numerous berthing spaces along the 2,200 foot (671 m) dockwall provide the facilities needed to construct multiple ships in assembly line fashion.

Marinette Marine's module construction method is complemented by separate cutting, fabricating, assembly, and trade shops allowing smooth and efficient movement of material and prefabricated components through the construction process. Many of the shops are equipped with overhead bridge cranes of up to 45 metric ton capacity; and multiple crawler cranes service the outdoor erection areas. Large modules and completed vessels are transferred and erected using a Dual Walking Beam ship transfer system.

Total employment at the yard in mid-1990 was 300, compared to 425 a year earlier.

Exhibit 7 is a current plot plan of Marinette Marine's facilities.



8. Moss Point Marine, Inc. (A Trinity Marine Group Shipyard)

The Moss Point Marine (MPM) Facility at Escatawpa, Mississippi, currently utilizes 50 acres of the 100 acres of developed land available along the east bank of the Pascagoula River just north of the city of Moss Point. MPM is a modern and well equipped medium sized shipyard commissioned in 1980. The MPM facility has been a leader in developing cost-efficient modular construction techniques, having constructed over one hundred (100) vessels to date. Thirty-seven of these vessels were constructed for U.S. Government agencies including four 274 foot (84 m) Logistic Support Vessels (LSVs) and two 175 foot (53 m) Landing Craft (LCUs) for the U.S. Army plus two 135 foot (41 m) LCU craft for the U.S. Navy. A majority of the balance of the vessels delivered by MPM were constructed for the offshore oil and gas industry. Nearly all of the vessels constructed in the MPM facility were built under special survey of the American Bureau of Shipping and inspected by the U.S. Coast Guard.

The MPM Yard offers 1,075 linear feet (328 m) of steel sheet pile bulkhead waterfront available for ship berthing. Two launchways with a maximum ship size of 500 feet (152 m) long by 82 feet (25 m) wide and a 4,080 metric ton distributed load capacity provides for side launching into the Pascagoula River. Water depth along the launchways is over 25 feet (8 m). In addition, the entire launch/building way area is serviced by two 181 metric ton and one 139 metric ton crawler cranes, plus various smaller size cherry picker cranes. Complete underground services are also provided to the entire waterfront area.

Two floating drydocks are available for docking vessels up to 1,180 metric tons and 190 feet (58 m) in length.

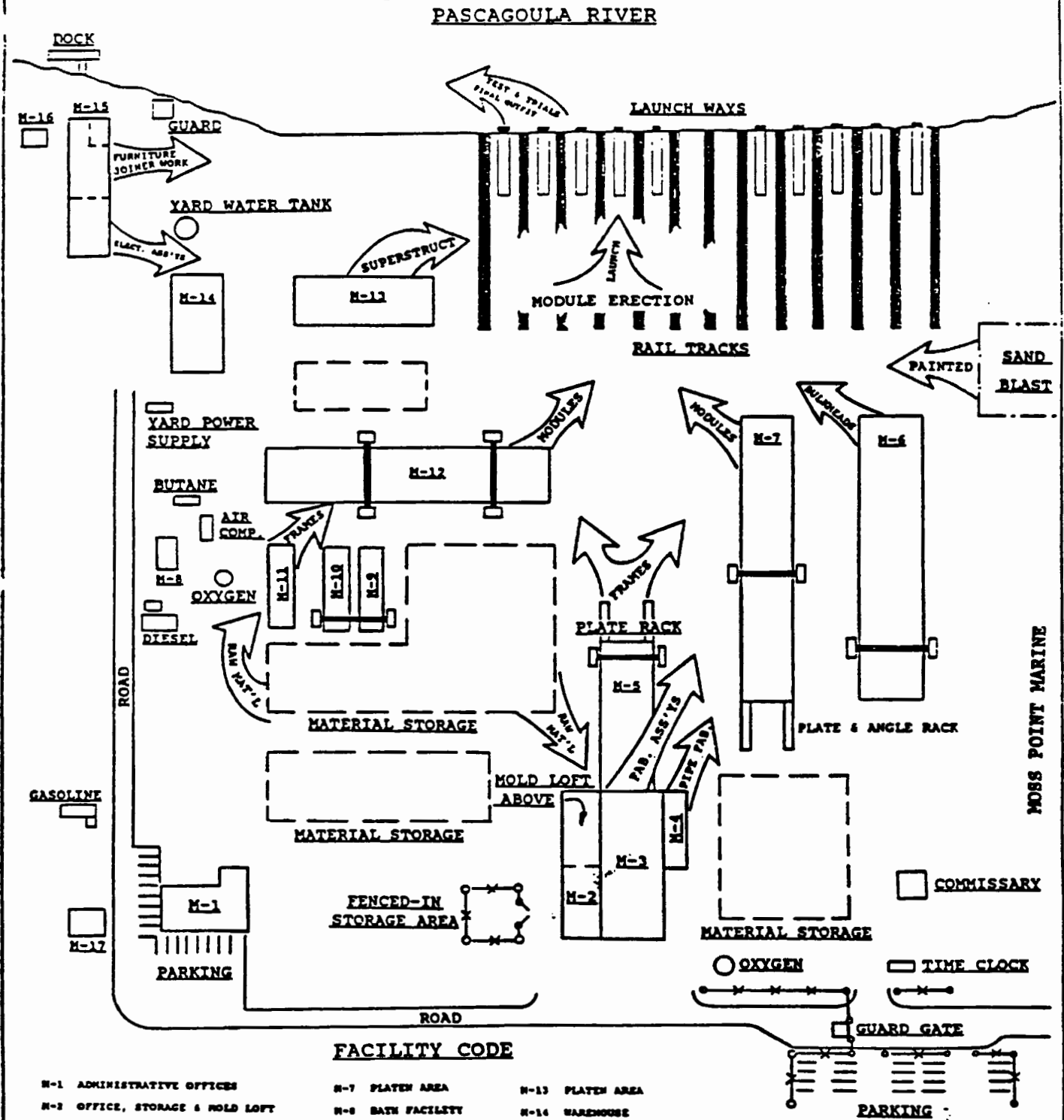
The facility also includes 15,000 square feet (1,393 square meters) of enclosed fabrication/shop space, 11,250 square feet (1,045 square meters) of enclosed storage space and more than 24,000 square feet (2,229 square meters) of outdoor storage. Convenient water, highway and air transportation access is available.

MPM's current backlog includes 35 - 175 foot (53 m) U.S. Army LCUs.

As of mid-1990, employment at Moss Point Marine was 329 personnel, compared to 400 in mid-1989.

Exhibit 8 is a current general arrangement plan of Trinity Marine Group's Moss Point facility.

CONSTRUCTION SEQUENCE FLOW



FACILITY CODE

- | | | |
|---------------------------------|-------------------|--|
| M-1 ADMINISTRATIVE OFFICES | M-7 PLATEN AREA | M-13 PLATEN AREA |
| M-2 OFFICE, STORAGE & MOLD LOFT | M-8 BATH FACILITY | M-14 WAREHOUSE |
| M-3 FAB SHOP | M-9 SPECIAL JIG | M-15 CARPENTRY, ELEC. SHOP & SAFETY |
| M-4 PIPE FABRICATION SHOP | M-10 SPECIAL JIG | M-16 VARNISH SHOP |
| M-5 PLATEN AREA | M-11 PLATEN AREA | M-17 ADMINISTRATIVE SUPPORT SERVICE OFFICE |
| M-6 PLATEN AREA | M-12 PLATEN AREA | |

9. National Steel and Shipbuilding Company

National Steel and Shipbuilding Company (NASSCO), the largest shipbuilder on the West Coast, participates in both the commercial and the U.S. Navy shipbuilding, conversion, and repair markets. In the marine business since 1945, the company has expanded and now occupies 145 acres on the harbor in San Diego, California. In 1989, NASSCO became an employee-owned company.

In the past, NASSCO has constructed OBO carriers, very large crude carriers (VLCC) up to 209,000 dwt, product carriers, destroyer tenders, a large cable repair ship, special purpose ships and a variety of Navy vessels. NASSCO conversion projects have included the conversion of two 90,000 dwt tankers to 1,000-bed hospital ships (T-AH), three containerships to Maritime Prepositioning Ships (T-AKX), and the reconstruction of three former Sea-Land SL-7 containerships to Fast Sealift Ships (T-AKR) for the Navy. Repair and overhaul work during the past few years consisted principally of Navy contracts.

NASSCO has contracts to design and construct three AOE class Fast Combat Support Ships for the Navy. In January 1990, NASSCO was awarded a commercial contract to build a containership for the Matson Navigation Company. NASSCO recently completed major repairs of the VLCC, the EXXON VALDEZ. As of October 1, 1990, NASSCO was performing overhaul and repair work on three Navy vessels.

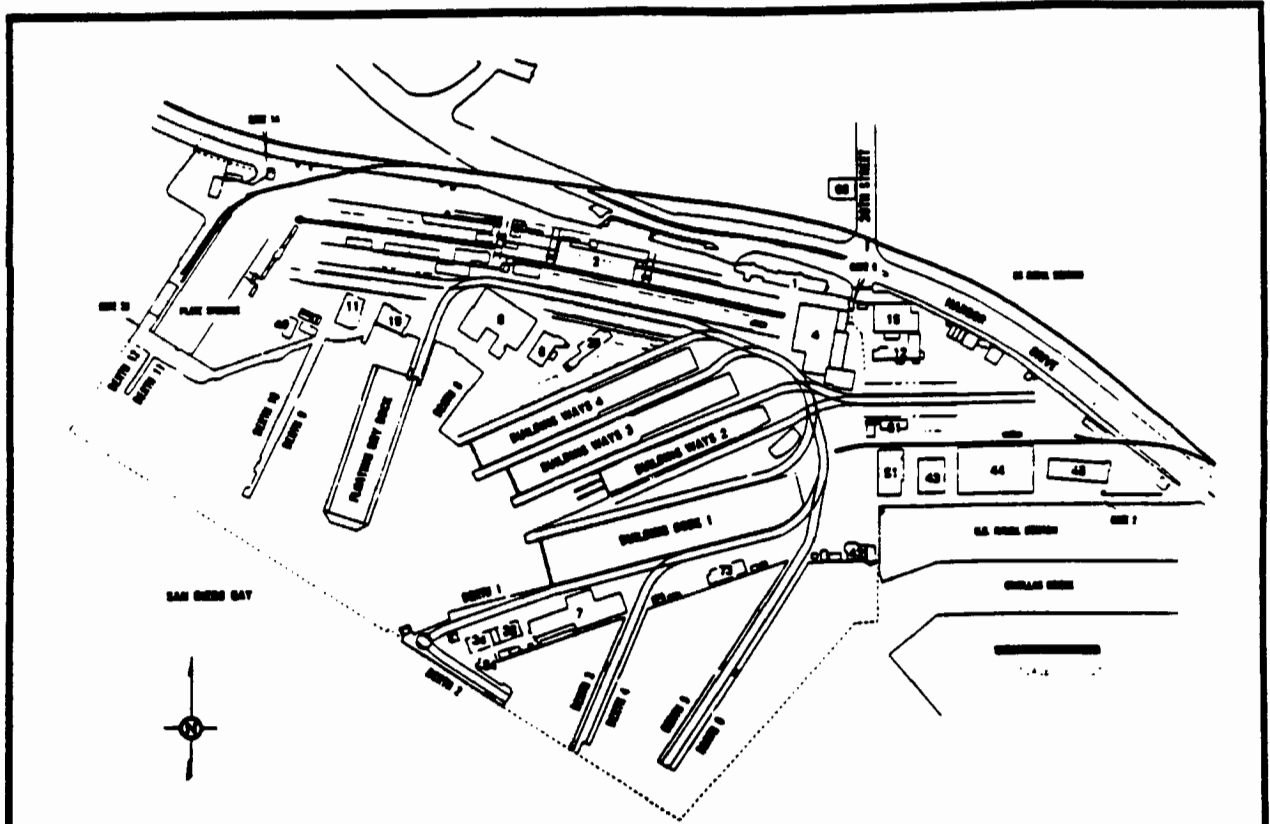
NASSCO's facilities include a building dock in which ships up to 980 feet by 170 feet (299 m by 52 m) can be constructed. In addition, the company operates three inclined building ways. Two of these can accommodate a maximum size ship of 900 feet by 110 feet (274 m by 34 m) and one a ship size of 690 feet by 90 feet (210 m by 27 m). Cranes are available that can provide lifts up to 159 metric tons. Berthing is available at 10 full-service berths that can accommodate ships with drafts up to 35 feet (11 m) and lengths up to 1,000 feet (305 m). NASSCO also operates a 25,400 metric ton floating drydock.

NASSCO has a full-service machine shop, carpenter shop, sheet metal shop and pipe shop with an automated pipe silo. The company's steel fabrication and assembly facilities, with a capacity of 1,816 metric tons per week, includes seven burning machines: one has a plasma arc and two have computer numerical control. Steel assembly facilities include a modern 52 foot (16 m) panel line, eight assembly tables with a combined area of 123,500 square feet (11,472 square meters), a turning jig for curved steel blocks, and an enhanced pin jig area with two bridge cranes. There is also an automated line for blasting and priming steel plates and shapes. NASSCO offers full-service marine engineering and naval architecture, utilizing the latest technology such as Computer-Graphics Augmented Drafting and Manufacturing System (CADAM).

As of mid-1990, the total labor force was 3,950, up from 2,015 in mid-1989.

Exhibit 9 is a current NASSCO plot plan.

NASSCO SHIPYARD LAYOUT



BLDG. NO.

- 1 ADMINISTRATION BUILDING
- 2 PLATE SHOP
- 4 PIPE SHOP
- 6 INSTRUMENT SHOP/MOTOR SHOP/REPAIR
- 7 SHEETMETAL SHOP/NEW CONSTRUCTION ELECTRICAL SHOP
- 8 MACHINE SHOP/REPAIR DEPARTMENT/ REPAIR PRODUCTION MANAGEMENT
- 11 REPAIR SHOP
- 12 MAINTENANCE/FACILITIES
- 18 ADMINISTRATION ANNEX
- 19 TOOL ROOM
- 28 PLATEN OFFICE

BLDG. NO.

- 34 GOVERNMENT TECHNICAL REPRESENTATIVE
- 38 SHIPS FORCE WORK AND STORAGE SUPPORT
- 40 COMBAT SYSTEMS SHOP
- 42 YARD CONFERENCE ROOM/SAFETY
- 43 WAREHOUSE
- 44 WAREHOUSE
- 46 WAREHOUSE
- 51 ENGINEERING
- 54 QUALITY ASSURANCE
- 60 CM-80
- 61 PAINT OFFICE
- 66 INFORMATION SYSTEMS
- 73 CARPENTER SHOP

DOCKS AND WAYS

- | | |
|--|---|
| BUILDING DOCK 1
1000' x 178' | BUILDING WAYS 4
906' x 118' |
| BUILDING WAYS 2
675' x 98' | FLOATING DRY DOCK
585' x 170' |
| BUILDING WAYS 3
906' x 118' | (140' CLEAN BETWEEN WINGWALLS) |

BERTHS

- | | |
|-----------------------------------|------------------------------------|
| BERTH 1
800' x 30' Deep | BERTH 6
1000' x 35' Deep |
| BERTH 2
900' x 30' Deep | BERTH 7
150' x 23' Deep |
| BERTH 3
560' x 30' Deep | BERTH 8
300' x 23' Deep |
| BERTH 4
625' x 30' Deep | BERTH 9
700' x 28' Deep |
| BERTH 5
950' x 35' Deep | BERTH 10
630' x 28' Deep |

10. Newport News Shipbuilding

Newport News Shipbuilding, located at the Port of Hampton Roads in Newport News, Virginia, is the largest shipbuilding complex in the United States. The company, founded in 1886, is a subsidiary of Tenneco, Inc. Newport News has built 25 aircraft carriers, 42 nuclear-powered submarines, and over 120 other surface ships for the U.S. Navy. Commercial vessels delivered by the yard include 71 cargo ships, 85 tankers, 61 passenger ships (most notably the famed superliner UNITED STATES), and more than 50 other self-propelled vessels. Newport News was a pioneer in the field of jumboizing ships, and since 1957 has completed 34 such operations. The last commercial vessel built in the yard was delivered in September 1983.

Newport News is the Nation's foremost builder of Navy nuclear warships. As of October 1, 1990, the yard was at work on three Nimitz class aircraft carriers and 11 attack submarines. Overhaul and repair of nuclear-powered submarines and surface ships for the Navy are also a principal activity at Newport News.

Included in Newport News major facilities are:

Docks and Shipways - There are eight separate docking facilities. Shipway 12, the largest building basin in the nation, is 1,613 feet (492 m) long, 250 feet (76 m) wide, and 33 feet (10 m) deep. Three positions for the intermediate gate expand the multi-ship construction capability of this dock, permitting simultaneous ship construction and repair. A 900 metric ton gantry crane, one of the largest in the world, can handle completely outfitted assemblies. This crane has a height of 234 feet (71 m) overall, a girder clearance of 200 feet (61 m) and a span between rail centers of 540 feet (165 m). Shipways 10 and 11 are used for construction work, as well as overhaul and repair, and are serviced by a 315 metric ton gantry crane. The other four graving docks (Dry Docks 1-4) are used mainly for ship repair and overhaul work. The floating drydock, which is 640 feet by 140 feet (195 m by 43 m), is primarily used as a part of the submarine land level facility.

Vessel Berthing - Newport News has two outfitting berths totaling 2,620 feet (799 m) each serviced by 30 metric ton cranes. There are six piers totaling 11,000 linear feet (3,353 m) serviced by cranes with capacities of up to 45 metric tons in addition to the two small piers included with the submarine land level facility.

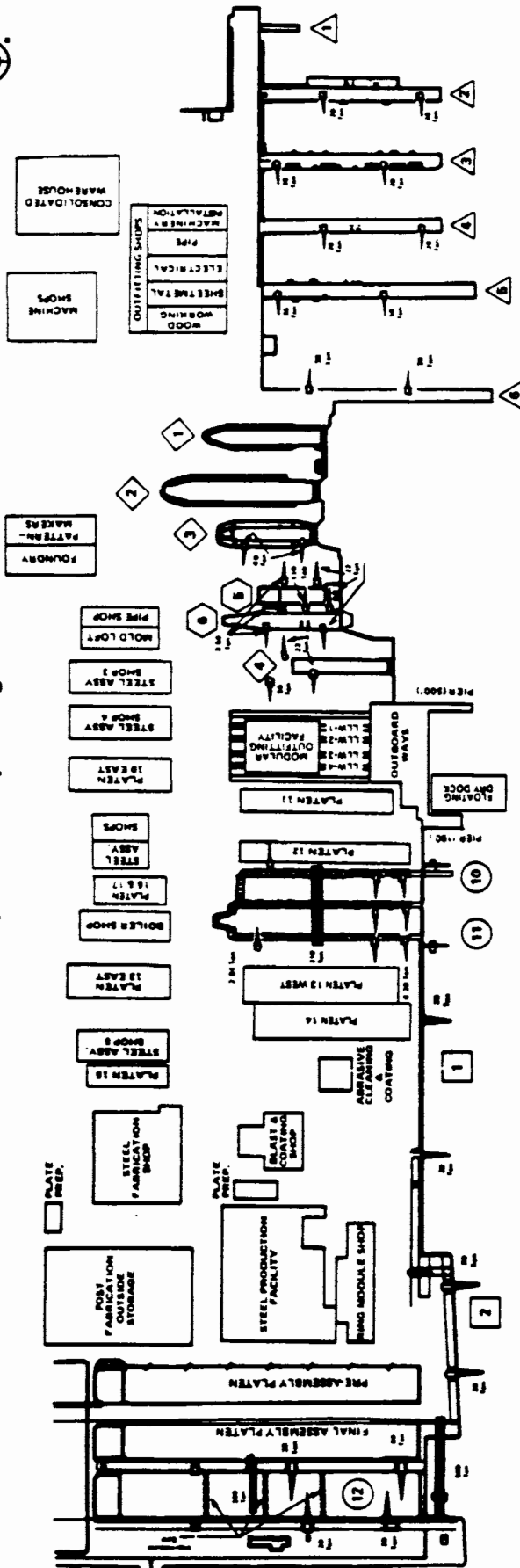
Submarine Construction and Repair Complex - This land level facility is currently being used for construction of nuclear attack submarines. It includes a modular outfitting facility (MOF), outboard ways, two small piers, a transporter and transfer system, and a floating drydock.

The labor force at Newport News in mid-1990 was about 25,945, compared to 26,000 a year earlier.

Exhibit 10 is a current general arrangement drawing showing the major facilities at Newport News.



Newport News Shipbuilding



James River



NOT TO SCALE

VESEL BERTHING FACILITIES

	Length	Width	Water Depth (m/LW)
Outboard Berth 1	1870	30	17
Outboard Berth 2	600	30	17
1	235	30	14
2	600	70	450.37M
3	600	66	506-05M
4	600	70	31
5	1100	70	250.10M
6	1100	60	317-10M
7	600	60	31
8	600	60	31
9	600	60	200-32M
10	1870	30	17
11	600	30	17

INCLINED SHIPWAYS

	Length	Width
Shipway 5	647	50
Shipway 6	640	50

DOCKS

Length	Width	Water Depth (M/LW)	
		Over	Under
640	82	33	30
640	100	31	29 (SHAD)
640	82	33	30
640	70	33	30
640	100	30	30
1100	140	40	30
1013	200	33	31
640	140	33	37.5

11. Peterson Builders Incorporated

Peterson Builders, Inc. (PBI), of Sturgeon Bay, Wisconsin, established in 1933, is a privately owned, full service, construction and repair shipyard, which serves the government, commercial and service industries. The shipyard offers construction capabilities in wood, steel, fiberglass and aluminum, as well as design and production expertise. Their continuing backlog of ship construction, complemented by conversion, repair, and special projects of unique assembly fabrications, enables PBI to maintain a skilled labor force and to keep pace with the latest technologies and developments in the industry.

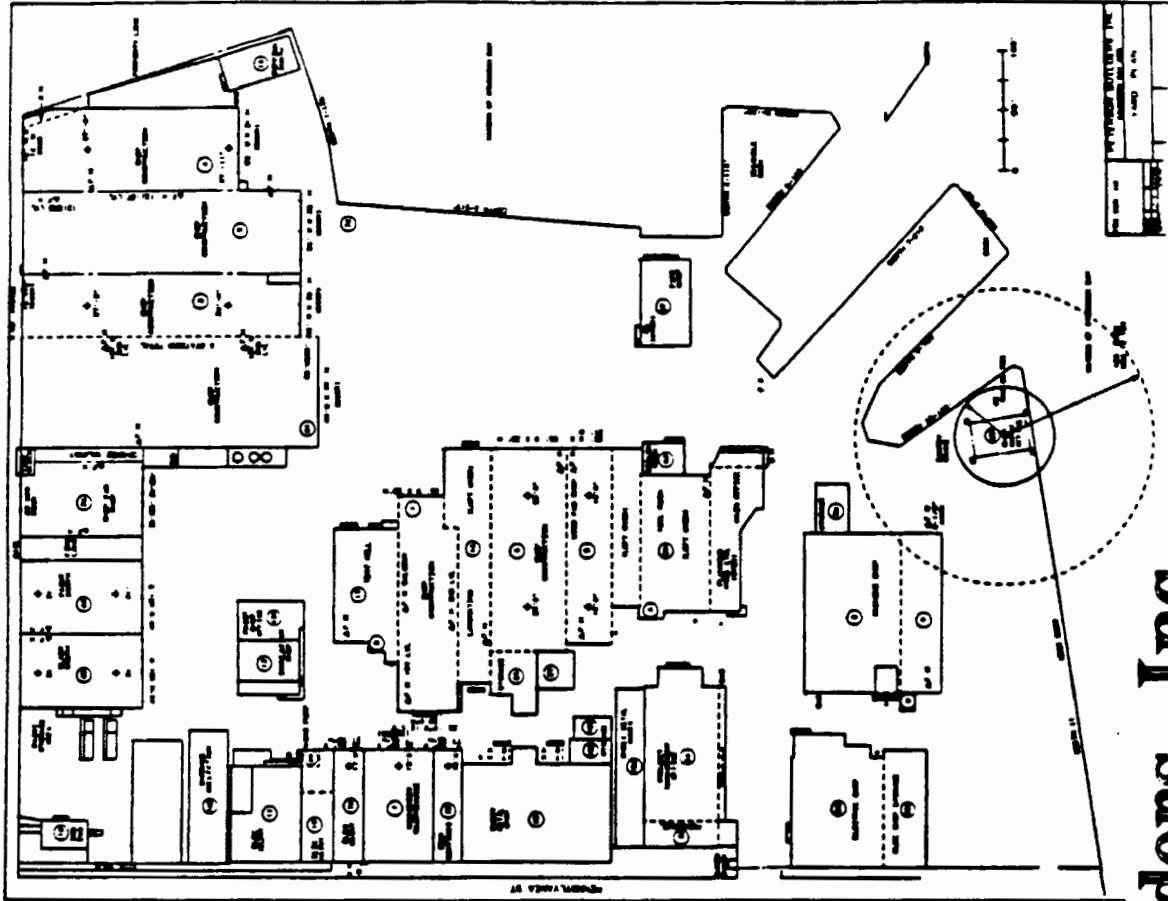
The main yard, with seven acres of buildings, provides inside construction and production facilities; total area is 13 acres. Extensive waterfront facilities provide berthing for vessels up to 900 feet (274 m) in length. PBI operates two side launching shipways; one can accommodate a maximum ship length of 500 feet (152 m) and the other 225 feet (69 m). Also, inside ship construction capabilities for vessels up to 230 feet by 60 feet (70 m by 18 m) are available. PBI's floating drydock has the capacity to accommodate a vessel up to 360 feet by 40 feet (110 m by 12 m) and is Navy-certified for 1,118 metric tons.

Current construction contracts underway at PBI are for six wooden 224 feet (68 m) Mine Countermeasure Ships (MCMs) for the U.S. Navy. Two MCMs were delivered to the U.S. Navy in 1990. As part of the Navy's mine warfare renewal program, these MCMs will replace ships in service since the early 1950's. PBI has been a leader in mine craft construction since that time; longer than any other shipyard in the world. This new generation of wooden ships being built at PBI are not the only "first of a kind" contracts awarded to the yard. Other "new class of ship" construction contracts completed for the U.S. Navy are four steel 255-foot (78 m) ARS Auxiliary Rescue/Salvage ships and seven wooden 108 foot (33 m) YP Yard Patrol craft. PBI also maintains a long-standing history for commercial vessel construction ranging from super tuna seiners, research ships, large passenger/car ferries, and a range of tugs.

During 1990, Peterson Builders delivered eight steel MK II Dive Boats with diving system modules to the U.S. Navy.

At mid-1990, the company's average total employment was about 1,000, compared to 775 in 1989.

Exhibit 11 is the current general plot plan of the Peterson Builders main yard in Sturgeon Bay, Wisconsin.



ABT Peterson Builders, Inc.

12. Portland Ship Repair Yard

The Portland Ship Repair Yard is part of the Municipal Corporation of the Port of Portland. The 125-acre shipbuilding and ship repair facility is located in Portland, Oregon, on the Willamette River. The yard was developed from the World War II Swan Island Shipbuilding facilities which delivered 1,076 oceangoing ships.

During 1990, projects undertaken by contracted users of the yard included the reduction in deadweight capacity of an oil tanker from 165,000 tons to 125,000 tons by removing a 55 foot (17 m) section of the ship and construction and load-out of \$75 million worth of gas handling modules for the North Slope oil fields.

The shipbuilding assets are augmented by the individual facility users' assets. Cascade General, Inc., Northwest Marine Inc., and West State, Inc., are contracted users of the facility.

The shipbuilding facilities at the Portland Ship Repair Yard are capable of producing modular-type units from 1,525 to 5,084 metric tons. Units are transported by rubber-tired vehicles, crawler or walker, via launching bridge to two locations. At one ship construction location, a vessel 475 feet by 100 feet (145 m by 30 m) can be constructed using the No. 3 drydock for launching. At the other location, a vessel up to 810 feet by 108 feet (247 m by 33 m) can be constructed using the No. 3 and No. 4 drydocks for launching.

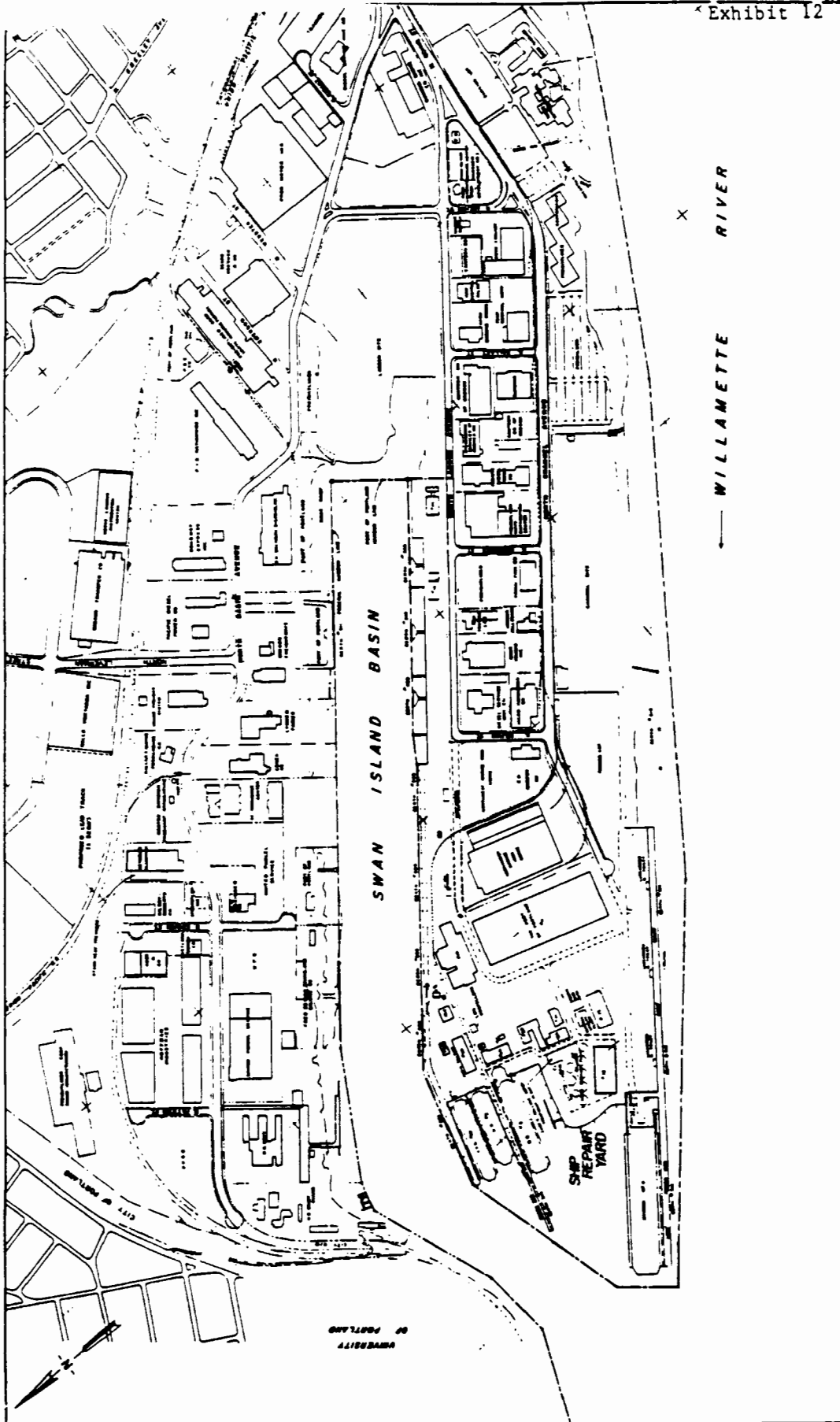
Portland Ship Repair Yard operates three drydocks. The largest two (No. 3 and No. 4) can accommodate vessels up to 810 feet by 108 feet (247 m by 33 m), and 1150 feet by 181 feet (351 m by 55 m), respectively. A total of 10,100 feet (3,078 m) of fully serviced pier space with 16 whirley type cranes are employed for outfitting. In 1986, a new layberth facility (Berth 315) was added which can accommodate two 1,100-foot (335 m) VLCCs in lay-up status.

The yard has 500,000 square feet (46,447 square meters) of fully-enclosed service shops and warehouse space. The 11 module assembly bays are 323 feet (98 m) long, 70 feet (21m) wide (clear), 60 feet (18 m) high (clear).

The Portland Ship Repair Yard is preparing to expand its modular construction capability by an additional 35 acres, located in the Swan Island Basin. This facility will be suitable for constructing ship modules.

As of mid-1990 the shipyard employed 3,135 persons, up from 2,015 in 1989.

Exhibit 12 is a current general arrangement plan of the Portland Ship Repair Yard facility and ship repair assets.



PORTLAND SHIP REPAIR YARD		SITE PLAN	
DESIGNED BY	T. TRUONG		PORT OF PORTLAND OFFICE OF PORTLAND ENGINEER
DRAWN BY	V. MALLORE		
DATE	JULY, 1988		
SHEET NO. 1 TOTAL SHEETS 1			

13. Robert E. Derecktor of Rhode Island, Inc.

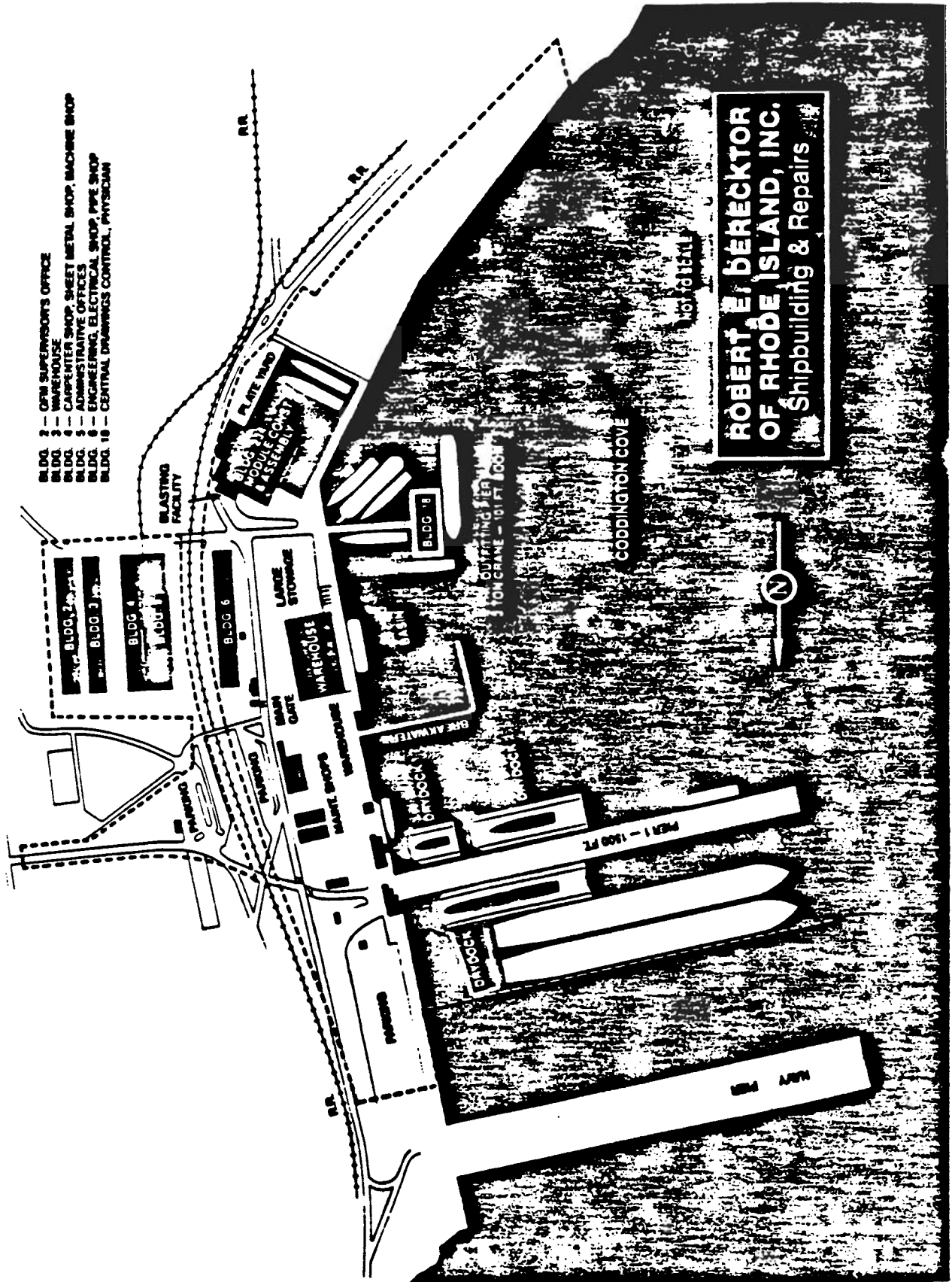
Robert E. Derecktor of Rhode Island, Inc., founded in 1979, is located in Middletown, Rhode Island. This Derecktor Shipyard comprises over 44 acres of land situated on Coddington Cove in Narragansett Bay. The facility is approximately 6.5 nautical miles from Brenton Reef Tower giving access to any size vessel. In 1975, Derecktor began to develop the 44 acres of waterfront property after the Navy abruptly deactivated most of its Rhode Island (Newport Naval Base) facilities in 1974. In 1979, negotiations with the Navy and the Rhode Island Department of Economic Development were concluded and the yard was officially opened. The first vessels built at the Rhode Island yard were 80-foot (24 m) fishing vessels. Over the years major conversion and repair work performed at the facility include: work on Navy and Coast Guard vessels, LNG tankers, floating drydocks, ferry boats, fire boats, barges, tugs, fishing trawlers, and miscellaneous private craft.

In January 1981, the Rhode Island yard was awarded a significant contract to design and construct nine 270-foot (90 m) medium endurance cutters (WMECs) for the United States Coast Guard. Work commenced on the project in June 1981. Nine WMECs have been delivered. The last vessel was delivered in July 1990. As of October 1, 1990, the yard had contracts for the construction of eight 128 foot (39 m) tugboats for the U.S. Army, with the options for three additional tugs. Other contracts included the construction of a 75 foot (23 m) DILLINGER, a high-speed custom designed yacht. The yard recently completed work on the USS JACK WILLIAMS (FFG-24) and is now working on the USS SIMPSON (FFG-56) to be followed by the USS CAPODANNO (FF-1093).

The facility is one of the most modern and complete in the northeast. This Derecktor yard utilizes a 153,000 square foot (14,213 square meter) fabrication and assembly building, several inside shops, warehouses, engineering, design and office buildings, a 272 metric ton crawler crane, a 1,500-foot (457 m) deep water pier, and 6,500 feet (1,981 m) of accessible and usable waterfront. In addition, the shipyard operates two floating drydocks which are joinable and thus capable of accommodating a vessel up to 725 feet by 90 feet (221 m by 27 m). For building vessels up to 500 feet (152 m) in length, modules are constructed in the fabrication building, with final erection and launching accomplished at the floating drydocks. Fully equipped machine, piping, hydraulic, electrical, painting, carpentry and engine overhaul shops, and tank cleaning/storage capabilities enable all work to be done in-house. Over the past six years, extensive machinery and equipment have been put into place. Also, in January 1988 the shipyard acquired a floating drydock capable of accommodating a vessel up to 650 feet by 106 feet (198 m by 32 m).

As of mid-1990, Derecktor's Rhode Island yard employment totaled 598, up from 575 at mid-1989.

Exhibit 13 is a current general arrangement of Derecktor's shipbuilding and repair facilities in Rhode Island.



14. Tacoma Boatbuilding Company

In operation since 1926 in Tacoma, Washington, this shipyard has designed, constructed, and repaired vessels for commercial customers, the Navy and Coast Guard, and foreign governments. Tacoma Boat's overall facilities consist of two yards covering over 30 acres of company-owned or leased property located adjacent to the Commencement Bay industrial complex.

Tacoma Boat has grown continuously through the years, producing a diversified construction pattern including a variety of standard-class tuna purseiners, a semisubmersible offshore oil-drilling rig, barges and tug/supply vessels for the offshore oil industry, WYTM icebreaking tugs and WMEC cutters 270 foot (82 m) long for the Coast Guard, revolutionary-design tractor tugs, and high-speed patrol ships, gunboats, and minesweepers for the Navy and/or foreign governments. The company also helped design and build an 80-knot surface effect ship (SES).

During the 1984 to mid-1990 period, Tacoma delivered 12 ocean surveillance ships (T-AGOS) to the U.S. Navy. This T-AGOS contract was a focal point for zone outfitting in which various portions or "zones" of a ship were built separately as virtually complete units and then assembled at the launchway.

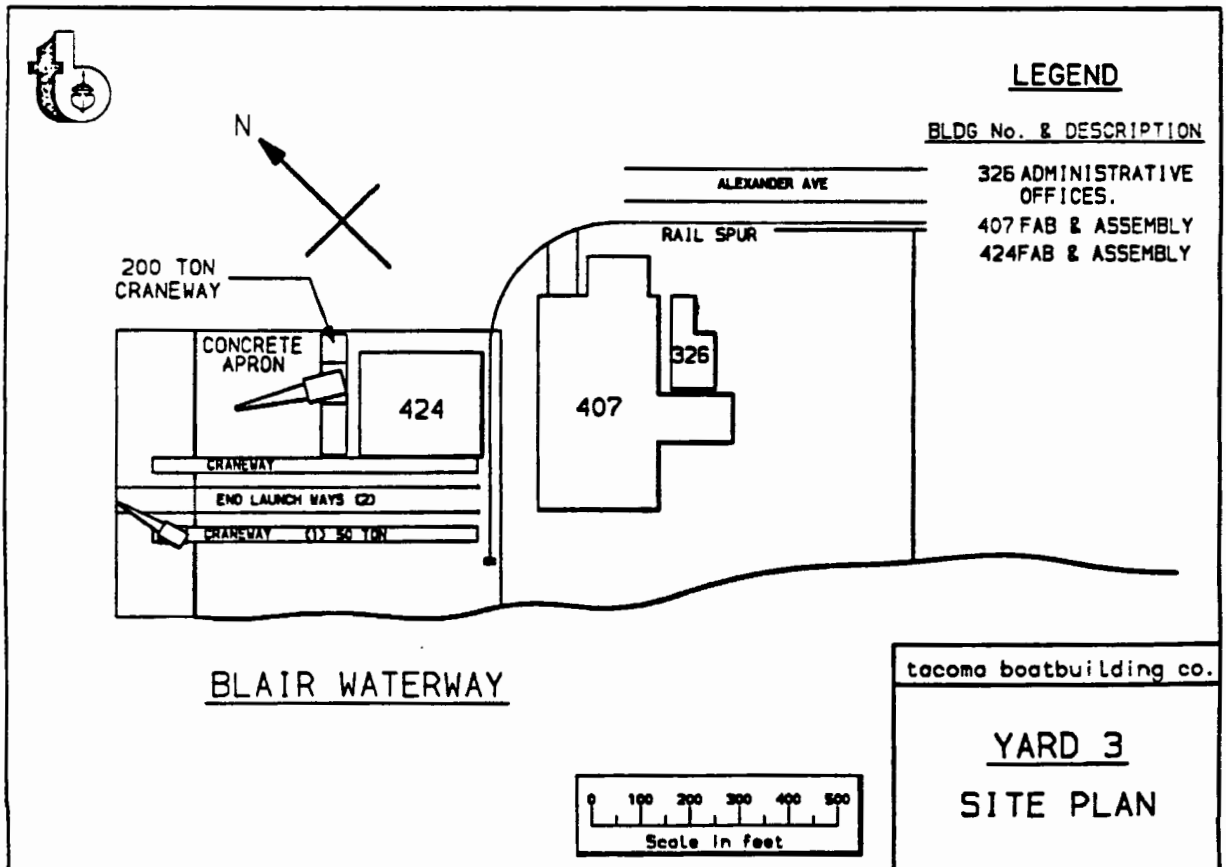
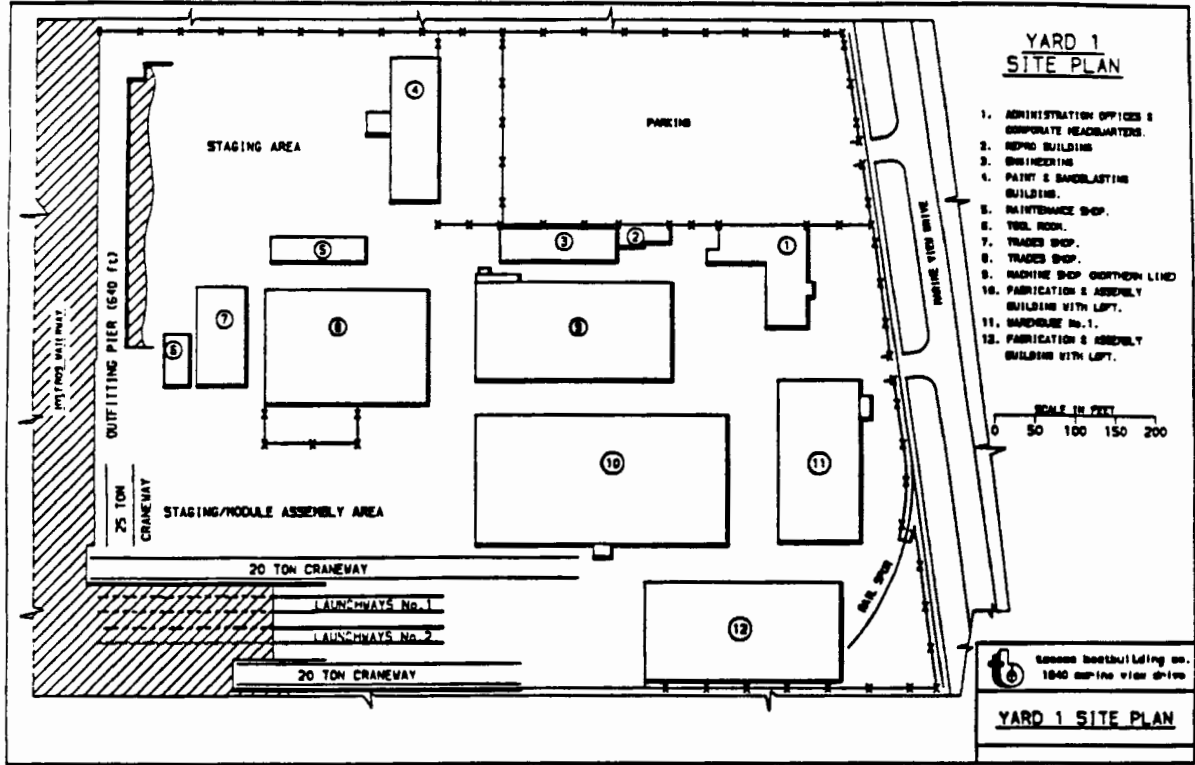
As of October 1, 1990, work underway at Tacoma Boat for the U.S. Navy included the conversion of the HAYES (T-AGOR-16) to a T-AG, the construction of two 150 foot (46 m) motor yachts and repair and maintenance to three trawlers. Additionally, the Company is working under a contract with the Republic of China to supply engineering design and technical assistance, as well as material, equipment and machinery for two 270 foot (82 m) Customs Preventative ships being constructed in Taiwan. The Company is also working under a contract with the Government of Egypt for the modernization of four Romeo-C Class submarines. This project includes the upgrading of the navigation, communications, electronic sensors and weapon systems and will be accomplished by the Company at the Egyptian Naval facilities in Alexandria, Egypt.

Tacoma Boat's facilities include four end-launch construction ways, the largest of which can construct vessels up to 430 feet (131 m) by 50 feet (15 m). Available for outfitting and repair work is 1,350 feet (411 m) of berthing space. In addition, a 200-foot by 60-foot (61 m by 18 m) maximum ship capacity marine railway was placed in operation in October 1986.

In early 1989, Tacoma Boatbuilding established a 90 percent owned subsidiary, United Shipbuilders of America, Inc. (USA), in order to facilitate entering the luxury yacht market. In April 1989, USA acquired the Burger Boat Companies and Striker Yachts located in Washington, Wisconsin, and Florida.

The total work force at Tacoma Boat at mid-1990 was 420, compared to 430 a year earlier.

Exhibit 14 is current general arrangement drawings of the company's two yards.



15. Tampa Shipyards, Incorporated

Founded in 1948, Tampa Shipyards, Inc., (formerly Tampa Ship Repair and Drydock Co.) is a full-service yard which was purchased by The American Ship Building Company in 1972 and is located on the recently deepened 43-foot (13 m) Sparkman Channel 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. During the 1980's significant projects completed by Tampa Ship included the conversion of four Moore-McCormack C4 cargo ships to larger self-sustaining breakbulk/container vessels and the construction of five 30,000 dwt clean-product, ice-strengthened tankers for charter to the Military Sealift Command.

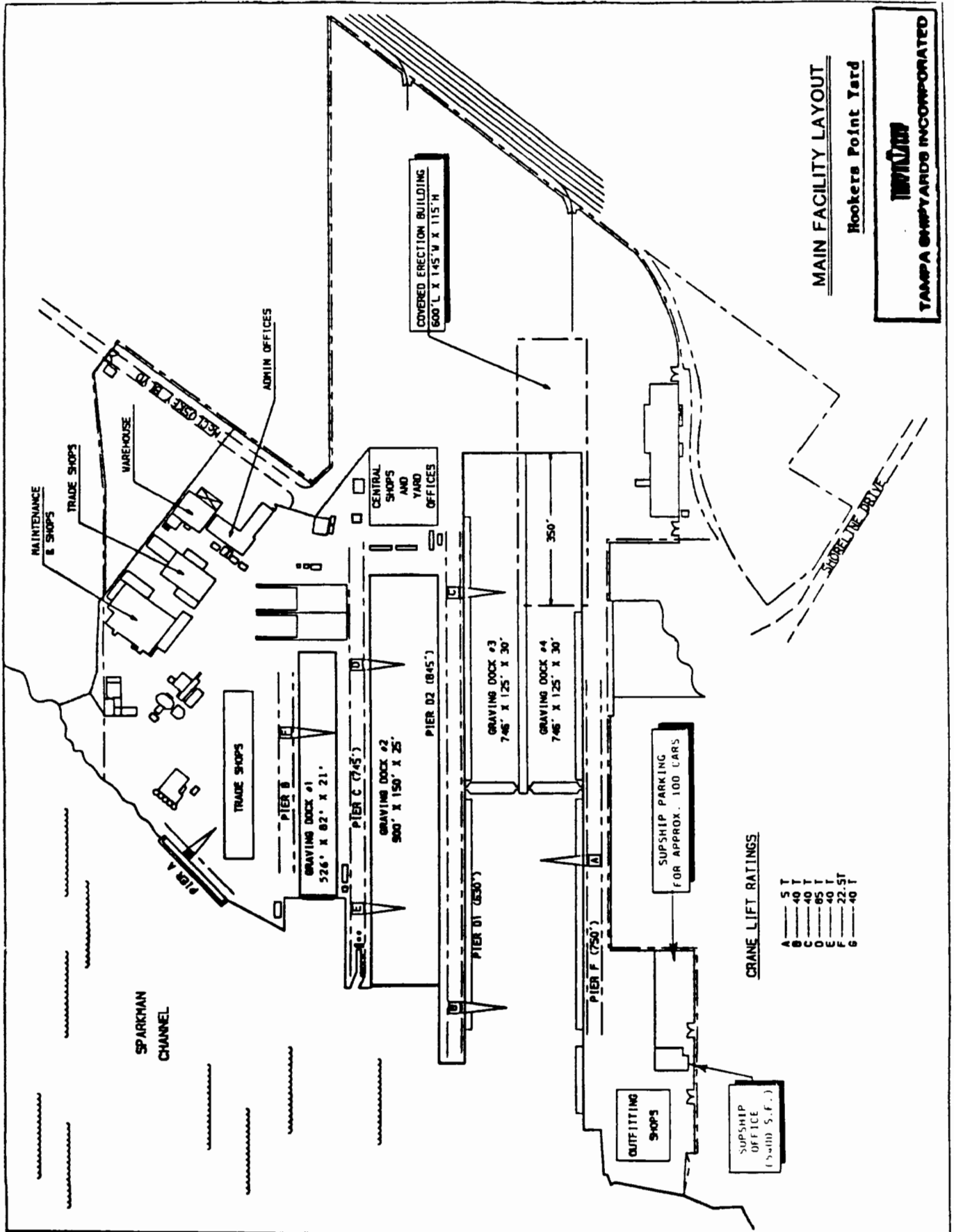
During 1989, Tampa Shipyards completed the conversion of two freighters to auxiliary crane ships, T-ACS 7 and 8, for the U.S. Navy. Work is currently underway on the completion of two T-AO fleet oilers, BENJAMIN ISHERWOOD and HENRY ECKFORD, which were originally contracted to Pennsylvania Shipbuilding Company in 1985.

Major facility installations were integrated into Tampa's ship construction program in 1984. The additions include: a concrete pier, two graving docks, two wet berths, additional shops, and an erection/assembly building. The erection/assembly building is 600 feet by 145 feet by 115 feet (183 m by 44 m by 35 m), and is serviced by three overhead bridge cranes with a combined lifting capacity of 800 metric tons. About 350 feet (107 m) of this building straddles one of the graving docks, allowing pre-assembled units weighing in excess of 608 metric tons to be erected in a totally enclosed environment. The company currently has four graving docks operational. The largest can handle ships up to 896 feet by 146 feet (273 m by 45 m). Two of the drydocks can accommodate a vessel as large as 742 feet by 106 feet (226 m by 32 m).

To provide additional fabricating capability, Tampa Ship has purchased the Westinghouse heavy steel fabricating facility on Tampa's Westshore Blvd. This facility provides 11 acres of covered fabrication floor, bridge cranes up 635 metric ton capacity, and barge loading facilities. The building is two hours by tow from Tampa Ship. This heavy steel fabricating facility is now referred to as the Westshore Facility. In addition, Tampa Ship currently leases two wet berths north of the main yard at South Slip. These wet berths are 840 feet (256 m) and 700 feet (213 m) long.

As of mid-1990, 830 people were on the Tampa payroll compared to 715 in mid-1989.

Exhibit 15 is a general plan of Tampa Ship's main yard. Neither the South Slip nor the Westshore Facility are shown.



MAIN FACILITY LAYOUT

Hookers Point Yard

TAMPA SHIPYARDS INCORPORATED

CRANE LIFT RATINGS

A	5 T
B	40 T
C	40 T
D	85 T
E	85 T
F	22.5T
G	40 T

16. Todd Pacific Shipyards Corporation - Seattle Division

Todd's Seattle Division is located at the northwest corner of Harbor Island in Elliot Bay, less than 10 minutes from downtown Seattle, Washington. From 1898 until 1916, when the William H. Todd Company of New York bought the shipyard from the Seattle Construction and Drydock Company, a variety of vessels were produced, including the world's finest six-masted barkentine and (at that time) the world's fastest single-screw steamer. This 52-acre yard has been a prime supplier of fighting ships for the Navy. During World War II, Todd-Seattle constructed over 125 ships and repaired and serviced some 2,700 deep draft vessels of all sizes, types, and flags. Since 1952, the yard has built 80 vessels of 20 different types.

As of October 1, 1990, work in the yard included the modernization of eight Hamilton class Coast Guard cutters with the last scheduled for redelivery in April 1992. This yard has an active ship repair and overhaul operation that annually works on a large number of commercial and naval vessels.

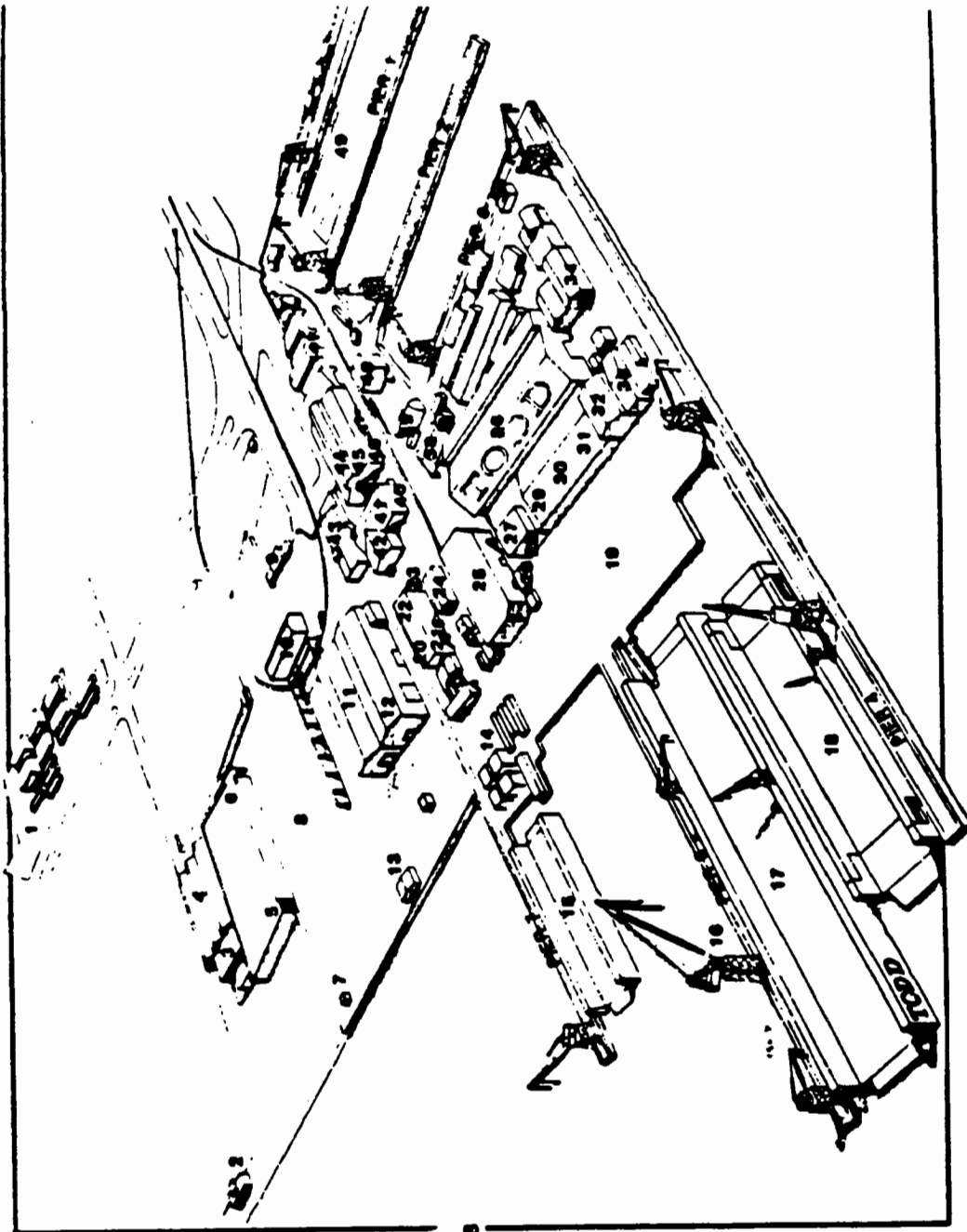
The largest building way at Todd-Seattle can handle a ship up to 600 feet by 96 feet (183 m by 29 m). It can also be used as a dual launchway for simultaneous construction of two ships with beams of 50 feet (15 m) or less. A small side-launch building way is also available. In addition to the 40,000 long ton drydock, there are two other floating drydocks, the larger of which can accommodate ships up to 943 feet by 133 feet (287 m by 41 m).

In July 1982, the company transferred a 40,000 long ton floating drydock from its San Francisco Division to Seattle. A new 137 metric ton traveling whirley crane on the adjacent 1,000-foot (305 m) concrete pier serves the floating drydock and the adjacent berths. A second pier was rebuilt in concrete and lengthened to give the yard a 1,400-foot (427 m) berth with a 40-foot (12 m) water depth.

Two wharves and five piers provide a total of 6,017 feet (1,834 m) of berthing space for outfitting and repair. The yard is serviced by 15 whirley traveling cranes, with lifting capacities ranging from 23 metric tons to 136 metric tons.

In mid-1990, total employment at the Seattle plant was 2,552, up from 1,670 at mid-1989.

Exhibit 16 is a current plot plan of Todd-Seattle's facilities.



- 1. CREW'S BERTHING
- 2. MESSING FACILITY
- 3. SHIPPING/RECEIVING
- 4. WAREHOUSE
- 5. DATA PROCESSING
- 6. PURCHASING
- 7. SMALL BOAT COVERED WORK AREA
- 8. STEEL STORAGE AREA
- 9. MAIN GATE/SECURITY
- 10. SHOT BLAST FACILITY
- 11. ALUMINUM FABRICATION
- 12. AUTOMATED BURNING EQUIPMENT
- 13. ACID BATH CLEANING
- 14. SITE OF SHIP'S OFFICE AND DUTY BERTHING
- 15. DRYDOCK NO. 2
- 16. 150 TON WHIRLEY CRANE
- 17. DRYDOCK NO. 3 "EMERALD SEA"
- 18. DRYDOCK NO. 1
- 19. STAGING AREA
- 20. PRODUCTION PLANNING
- 21. CAFETERIA
- 22. NEW CONSTRUCTION SHIP SUPERINTENDENTS
- 23. COMBAT SYSTEMS DEPARTMENT
- 24. OUTSIDE MACHINE SHOP
- 25. INSIDE MACHINE SHOP
- 26. PORT ENGINEERS OFFICE
- 27. REPAIR SUPERINTENDENTS
- 28. YARD OFFICE
- 29. PIPE SHOP
- 30. CENTRAL TOOL ROOM
- 31. CARPENTER SHOP
- 32. ELECTRIC SHOP
- 33. RIGGING LOFT
- 34. SHEET METAL
- 35. QUALITY ASSURANCE
- 36. MAIN STEEL SHOP
- 37. MARINE CHEMIST/FIRE DEPT.
- 38. PUMP, MOTOR & VALVE SHORTEST FACIL
- 39. PAINT SHOP
- 40. DISPENSARY/CLAIMS DEPT.
- 41. ENGINEERING
- 42. NAVY PROGRAM OFFICE
- 43. ADMINISTRATION OFFICES
- 44. TECHNICAL LIBRARY DRAWING CONTROL
- 45. TEST & TRIAL OFFICE
- 46. GENERAL SUPERINTENDENTS
- 47. SOUTH STEEL SHOP
- 48. MISSILE LAUNCHER ASSEMBLY BUILDING
- 49. CONSTRUCTION WAYS

PACIFIC SHIPYARDS CORPORATION
SEATTLE DIVISION

17. The Toledo Shipyard

In January 1985, the Toledo-Lucas County Port Authority purchased this shipyard from The American Ship Building Company which owned the yard since 1947 and closed it in 1982. In September 1985, the yard was re-opened when Merce Industries, Inc., a 25-year old topside repair firm, entered into an agreement with the Port Authority to operate the shipyard for 25 years. The Toledo Shipyard is a complete, full-service shipyard, equipped for new construction, conversion, repair, and propeller repair.

Since Merce Industries, Inc., began operating the yard, they have made extensive repairs and have upgraded and renovated the facility, including the leveling of the old fit-out building adjacent to one of the drydocks, which improved access to the pier area between the graving docks and the wet slip area. Merce Industries elected not to lease the buildings immediately adjacent to the yard as the firm had existing facilities that were superior and in the nearby area. These existing facilities include a 4645 square meter fabricating/propeller repair facility and a 1115 square meter machining and pressure vessel shop.

Complete facilities for propeller repair services in all alloys is available through the American Propeller Division.

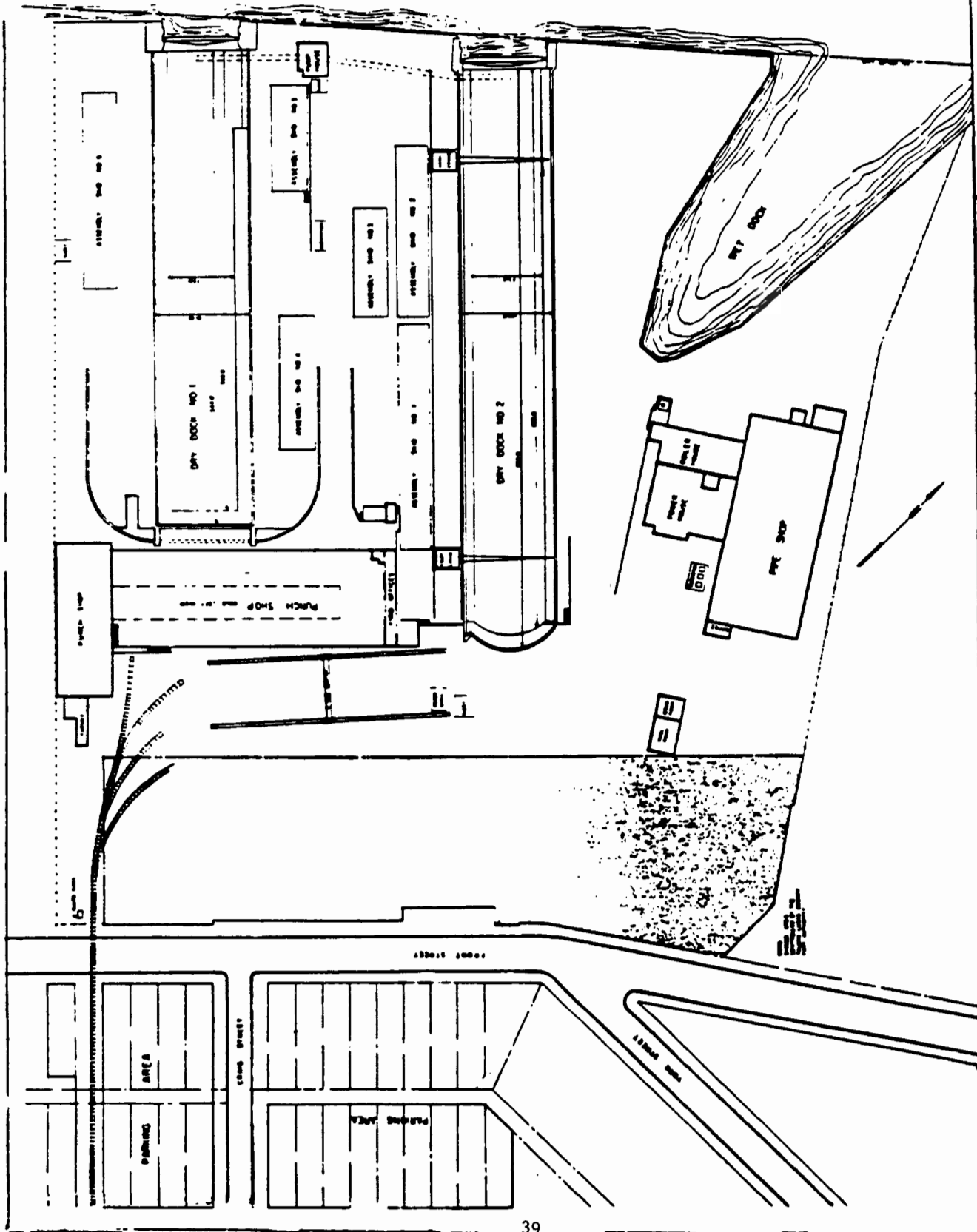
The company maintains two graving docks. One can accommodate vessels up to 680 feet by 78 feet (207 m by 24 m), and the other, vessels as large as 540 feet by 68 feet (165 m by 21 m). Usable berthing space totals about 1,600 feet (488 m).

On December 17, 1986, Toledo Shipyard filed for protection under Chapter 11 of the U.S. bankruptcy code. In June 1988, the court approved a reorganization plan allowing a five-year repayment period.

As of mid-1990, employment at the shipyard totaled 25. Employment increases during the winter months as repair activity on the Great Lakes increases.

Exhibit 17 is a current lay-out of The Toledo Shipyard operated by Merce Industries, Inc.

MAUMEE RIVER



WERCER INDUSTRIES

GENERAL ARRANGEMENT

DATE: 10-13-66

THE TOLEDO SHIPYARD

18. Trinity Industries, Inc. - Beaumont Yard

This shipyard, located on the Neches River in Beaumont, Texas, was established in 1917 by Beaumont Shipbuilding and Drydock Company, which built C1-A cargo ships and Navy minesweepers during World War II. In 1947, the yard was acquired by Bethlehem Steel Corporation, which pioneered the design and production of mobile offshore drilling rigs, drill ships, offshore oil and gas facilities and barges. After closure in mid-1988, the yard was acquired and reopened in mid-1989 by Trinity Industries, Inc., of Dallas, Texas.

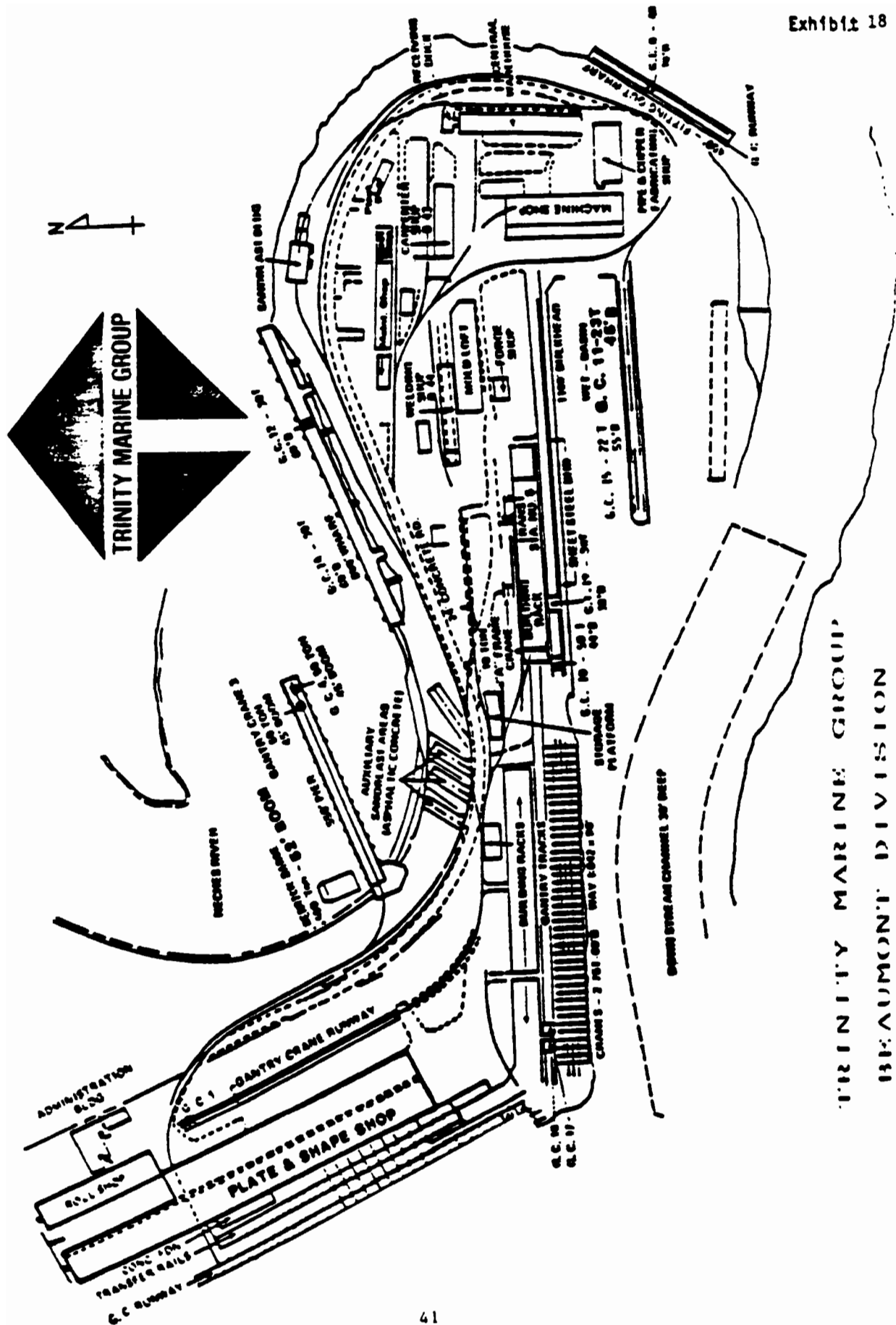
Trinity's Beaumont yard is highly mechanized. In the early 1970s, a multimillion-dollar panel line and material handling facilities were installed. In recent years, capital improvements included installation of a CNC plasma burning machine, larger plate bending rolls, larger overhead bridge cranes, pipe burning and bending equipment, a pipe fabrication shop, improved welding equipment, mobile cranes, and improved building platens.

Trinity-Beaumont has one side-launching way that can accommodate ships up to approximately 875 feet by 105 feet (267 m by 32 m). Also, the yard is currently in final negotiations to acquire a floating drydock (AFDM-2) from the Navy. This drydock which can accommodate a vessel up to 650 feet (198 m) in length with a beam of 95 feet (29 m), is expected to be in operation by March 1991.

There are 4,600 feet (1,402 m) of fully-serviced piers and wharves and mobile equipment for servicing ships or other vessels at pierside or anchorage. With a 500-ton (508 metric ton) lift capacity, the company's barge-mounted "Big Bessie" is the largest floating derrick between Houston and New Orleans.

Employment at Trinity's Beaumont facility at mid-1990 was 57 personnel. While awaiting a major marine construction contract, Trinity is utilizing the yard's flexibility by repairing and servicing railcars, building LPG tank barges and both inland and ocean hopper barges.

Exhibit 18 is a current layout of Trinity's Beaumont plant and facilities.



TRINITY MARINE GROUP

TRINITY MARINE GROUP
BEAUMONT DIVISION

SHIP REPAIR INDUSTRY

While over 200 privately owned firms of varying capabilities are involved in repairing ships in the United States, only 47 yards are capable of drydocking vessels 400 feet in length and over. For ships this size, the U.S. shipbuilding and repair industry is currently operating a total of 52 floating drydocks, 28 graving docks, and 3 marine railways. However, some of these graving docks are committed to new construction. The large organizations which have drydocks generally have extensive waterfront acreage and are capable of all types of ship repair and maintenance. Major shipyards usually combine repair, overhaul, and conversion with shipbuilding capabilities, and employment usually numbers in the thousands. It is difficult to draw a sharp line between shipbuilding yards and ship repair yards, as many of the two engage in both types of work.

Repair (with Drydocking) Facilities

Major drydocking facilities are defined in this report as those yards having at least one drydocking facility that can accommodate vessels 400 feet (122 m) in length and over, provided that water depth in the channel to the shipyard itself is at least 12 feet (4 m). These facilities may also be capable of constructing a vessel less than 400 feet (122 m) length overall.

Appendix B tabulates information updated through 1990 on 35 of these repair yards by geographical location. Additional information is available in the Office of Ship Construction.

Major Topside Repair Facilities

Major topside repair facilities are those that have sufficient berth/pier space for topside repair of ships 400 feet (122 m) in length and over, provided that water depth in the channel to the facility itself is at least 12 feet (4 m). These facilities may also have drydocks and/or construction capability for vessels less than 400 feet (122 m) in length. Services rendered by these firms vary from a simple repair job to a major topside overhaul, particularly when the work on oceangoing ships can be accomplished without taking the ships out of the water. It is common practice for a shipyard 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.

Appendix B also tabulates information through 1990 on the 52 topside repair yards' facilities (berth/pier space). The yards' building ways, drydocks, marine railways, etc., are not addressed herein as they cannot accommodate vessels 400 feet (122 m) in length and over. However, detailed data for these facilities were obtained during the MARAD annual shipyard survey and are available in the Office of Ship Construction.

ACTIVE SHIPBUILDING BASE

The Active Shipbuilding Base, as identified by the Navy and MARAD, is comprised of 16 privately owned U.S. shipyards which are open and currently engaged in or seeking contracts for the construction of major oceangoing or Great Lakes ships 1,000 gross tons or over. Exhibit 21 of this report identifies and geographically locates these 16 yards.

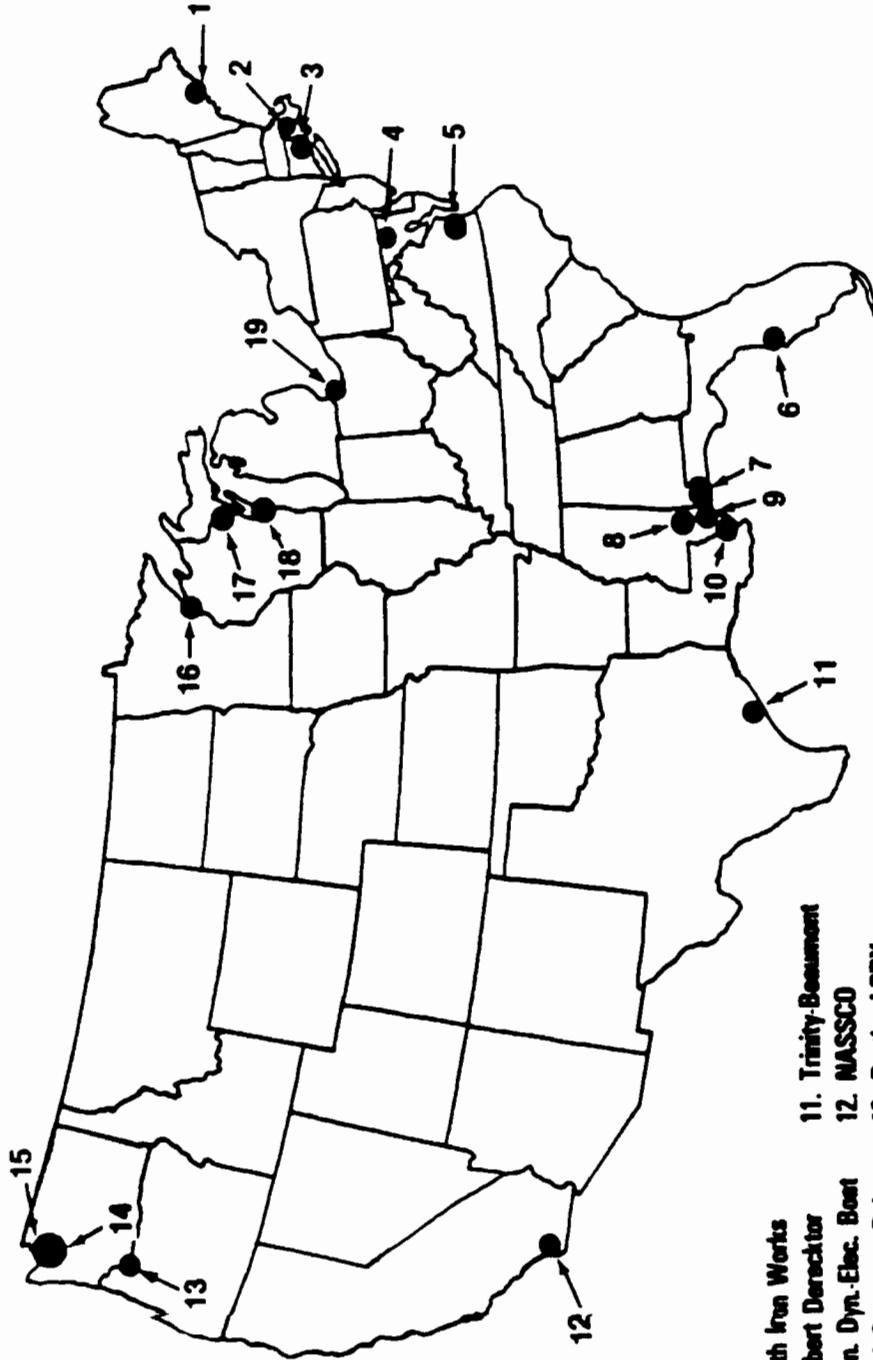
During 1990, the number of yards in the Active Shipbuilding Base remained unchanged. As of October 1990, these 16 yards employed roughly 75 percent of the U.S. shipbuilding and repair industry's total work force, as reported by the Bureau of Labor Statistics under SIC 3731. At that same time, 93 percent of the production workers in these 16 shipyards were engaged in Navy or Coast Guard ship construction and repair work.

As of year end, nine of the 16 shipyards were engaged in construction and/or conversion of major combatant and auxiliary ships for the Navy. Two of the yards were engaged primarily in ship construction work provided by the Navy's T-Ship program. Nine of the yards had only repair and overhaul work, smaller Navy vessel orders, and non-ship construction work.

Employment projections for production workers is shown by Exhibit 22 of this report. These data are generated by overlaying Navy projected four-year shipbuilding and conversion programs onto the estimated work force required to complete the current firm orderbook.

SHIPBUILDING INDUSTRY
AND ACTIVITIES - 1990

SHIPBUILDING INDUSTRY IN THE UNITED STATES



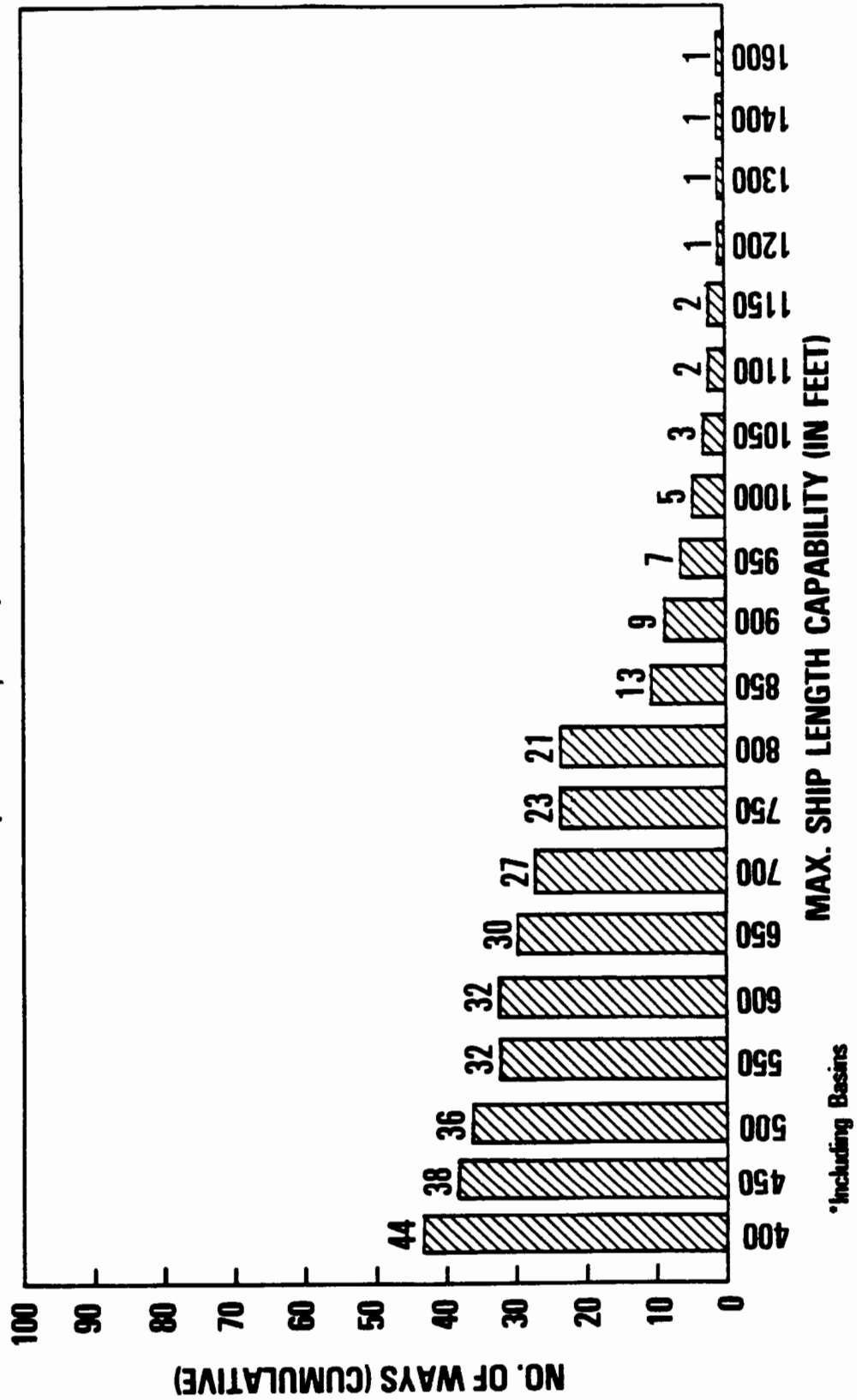
- 1. Bath Iron Works
- 2. Robert Darractor
- 3. Gen. Dyn.-Elec. Boat
- 4. Bath-Sparrows Point
- 5. Newport News SB
- 6. Tampa Shipyards
- 7. Alabama Shipyard
- 8. Moss Point Marine
- 9. Ingalls/Litton
- 10. Avondale Shipyards
- 11. Trinity-Bessemer
- 12. MASSCO
- 13. Portland-SRY
- 14. Tacoma Boat
- 15. Todd-Seattle
- 16. Fraser Shipyards
- 17. Marinette Marine
- 18. Peterson Builders
- 19. Toledo Shipyard

U.S. SHIPBUILDING FACILITIES

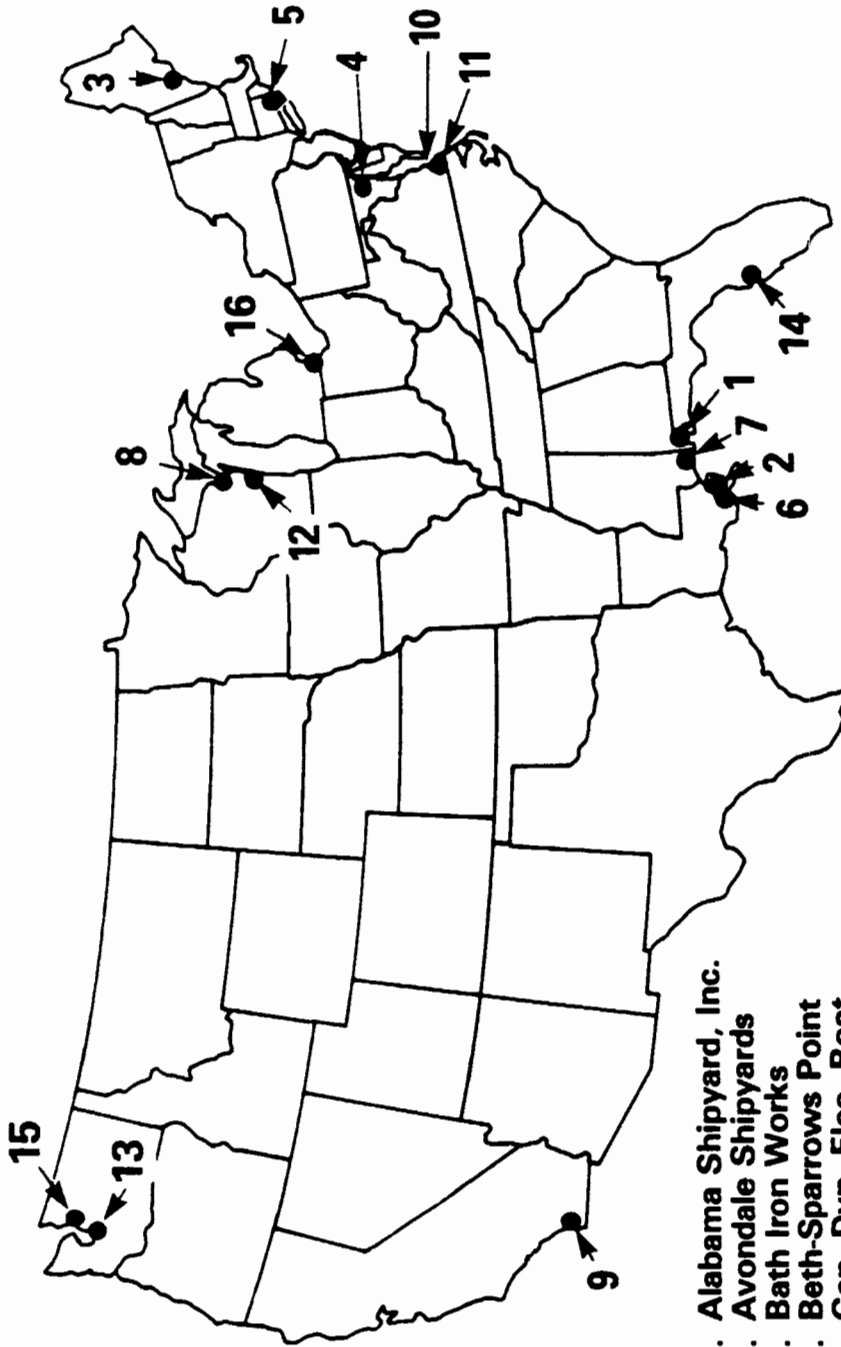
1990

MAJOR U.S. SHIPBUILDING FACILITIES

***NUMBER OF SHIPWAYS BY MAXIMUM LENGTH CAPABILITY
(OCTOBER 1, 1990)**



ACTIVE U.S. SHIPBUILDING BASE



- 1. Alabama Shipyard, Inc.
- 2. Avondale Shipyards
- 3. Bath Iron Works
- 4. Beth-Sparrows Point
- 5. Gen. Dyn.-Elec. Boat
- 6. Halter Marine-Equitable
- 7. Litton/Ingalls
- 8. Marinette
- 9. NASSCO
- 10. Newport News
- 11. Norfolk SB & DD
- 12. Peterson
- 13. Tacoma Boat
- 14. Tampa Ship
- 15. Todd-Seattle
- 16. Toledo Shipyard

1990

Shipbuilding Industry Workload Projection

Active Shipbuilding Base Summation

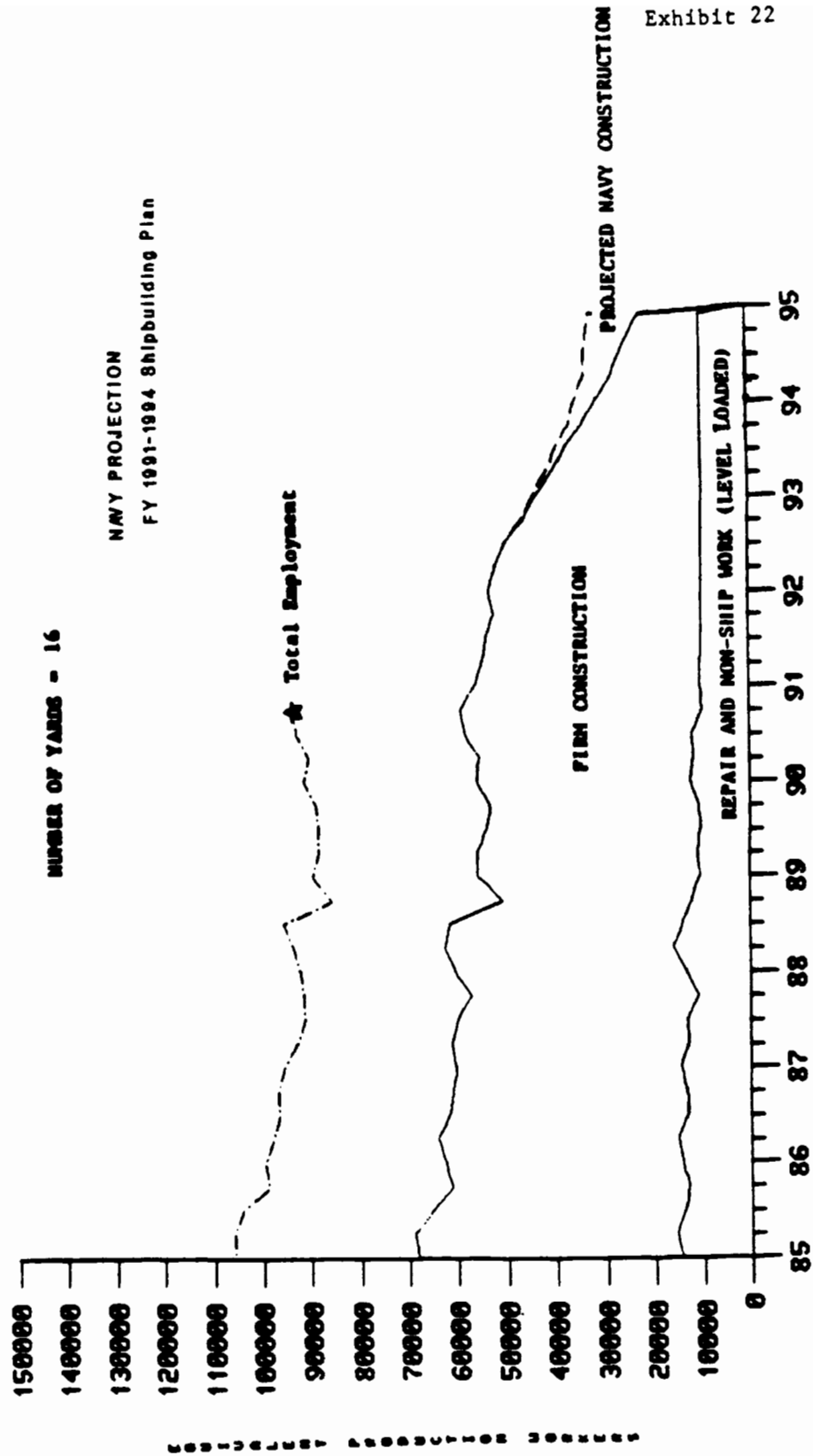


Exhibit 22

SOURCE: Shipyard Data from form MA-832 when provided.
OFFICE OF SHIP CONSTRUCTION, MARITIME ADMINISTRATION

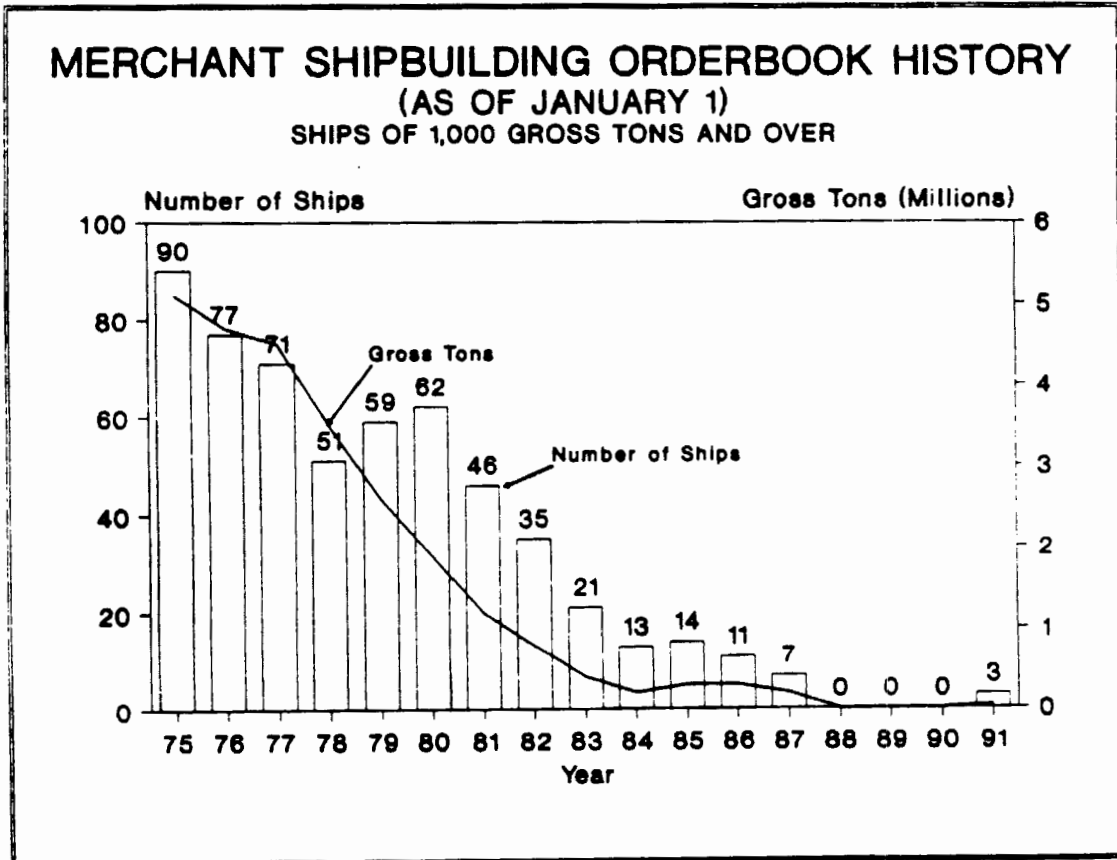
OCTOBER 1990

COMMERCIAL SHIP CONSTRUCTION

The U.S. commercial ship construction market, which had declined steadily for 15 years and has had no new orders under contract for the last three years, has experienced a slight upturn in orders (Exhibit 23). In January 1990, National Steel and Shipbuilding Company (NASSCO) of San Diego, received the first oceangoing commercial ship order placed in a U.S. shipyard since October 1984. This order, placed by Matson Navigation Company, is for a 713-foot diesel-powered containership of 32,600 gross tons (gt) designed to carry 1,650 24-foot containers. The ship is scheduled for delivery in June 1992.

In October 1990, Eastern Shipyards, Inc. of Panama City, Florida, signed a contract with Freeport-McMoran Resource Partners to build two sulphur carriers. Each 398-foot ship will carry 7,500 tons of liquid sulphur from Freeport-McMoran's mining complex in the Gulf of Mexico to Port Sulphur, Louisiana, on the Mississippi River. The first ship is expected to be delivered in September 1991 and the second ship in February 1992.

Exhibit 23

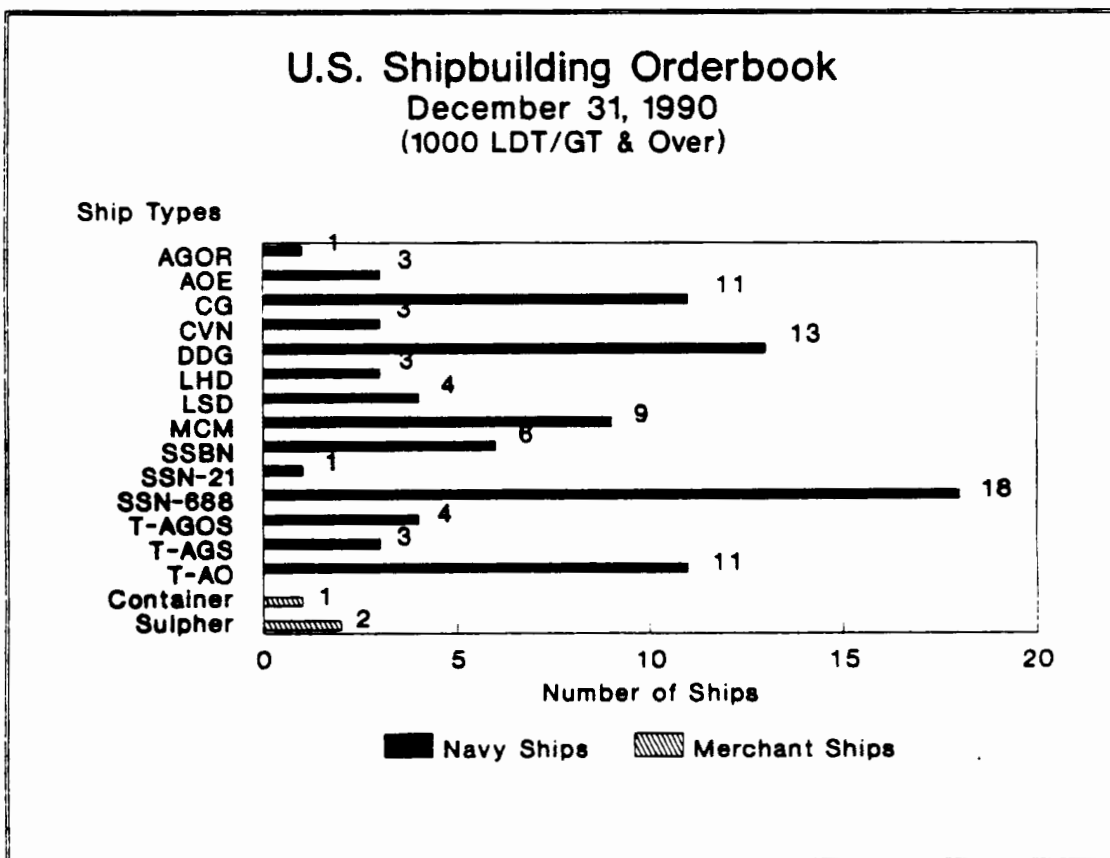


U.S SHIPBUILDING ORDERBOOK

As of December 31, 1990, new ships on order or under construction (naval vessels 1,000 light displacement tons (ldt) and larger and commercial ships 1,000 gross tons (gt) and larger) in U.S. private shipyards totalled 88 naval and 3 commercial vessels (Exhibit 24). There were no new U.S. Coast Guard vessels on order or under construction as of December 31, 1990. The last Coast Guard ship on order was completed on July 23, 1990.

Twelve shipyards had contracts for the construction of naval and commercial vessels; eleven shipyards had orders for the construction of naval ships. The naval shipbuilding orderbook consisted of 24 ships scheduled for delivery in 1994 and later. Two shipyards had orders for three commercial ships with deliveries scheduled in 1991 and 1992. The orderbook is comprised of 16 different types of vessel.

Exhibit 24



NEW SHIPBUILDING ORDERS - 1990

In 1990, U.S. shipyards received orders for the construction of seven naval and three commercial ships (Exhibit 25). Contracts were placed for the construction of three guided missile destroyers (DDGs) at Ingalls Shipbuilding, Pascagoula Mississippi; two DDGs at Bath Iron Works Corporation, Bath, Maine; one deep ocean survey ship T-AGS 45 at Avondale Industries, New Orleans, Louisiana; and one fleet ballistic missile submarine (SSBN) at General Dynamics Corporation - Electric Boat Division, Groton Connecticut. The total contract value for these ships was about \$2.0 billion.

National Steel and Shipbuilding Company (NASSCO), San Diego, California, received an order from Matson Navigation Co., for a \$129 million containership designed to carry 1,650 24-foot containers, and Eastern Shipyards, Inc., Panama City, Florida received a contract to build two sulphur carriers from Freeport - McMoran Resource Partners. The above commercial shipbuilding contracts were the first placed with U.S. shipyards since 1984.

Exhibit 25

SHIPBUILDING ORDERS - 1990					
<u>NAVAL SHIPS</u>					
<u>Shipyard</u>	<u>Symbol No.</u>	<u>Contract Price * (MIL.)</u>	<u>LDT</u>	<u>Contract Date</u>	<u>Estimated Delivery Date</u>
Ingalls	DDG-59	\$204.7	8,300	02/22/90	09/23/94
Ingalls	DDG-61	\$204.7	8,300	02/22/90	01/27/95
Ingalls	DDG-63	\$204.7	8,300	02/22/90	05/26/95
Bath Iron	DDG-60	\$256.0	8,300	02/22/90	10/30/94
Bath Iron	DDG-62	\$256.0	8,300	02/22/90	03/16/95
Avondale	T-AGS-45	\$104.4	7,312	04/04/90	11/30/92
GD- EB	SSBN-743	<u>\$765.0</u>	<u>12,500</u>	12/19/90	NA
Total		\$1,995.5	48,812		
<u>COMMERCIAL SHIPS</u>					
<u>Shipyard</u>	<u>Vessel Type</u>	<u>Contract Price * (MIL.)</u>	<u>DWT</u>	<u>Contract Date</u>	<u>Estimated Delivery Date</u>
NASSCO	Containership	\$129.0	23,314	01/31/90	06/15/92
Eastern Shipyards	Sulphur Carrier	NA	7,500	10/10/90	09/24/91
Eastern Shipyards	Sulphur Carrier	NA	<u>7,500</u>	10/10/90	02/24/92
Total			38,314		

SHIP DELIVERIES - 1990

During calendar year 1990, 13 new naval and one Coast Guard vessel, 1,000 light displacement tons (LDT) and larger, were delivered by U.S. private shipyards. The vessels delivered totaled 102,040 light displacement tons (ldt) and had an initial contract value of over \$2.3 billion (Exhibit 26). The numbers and value of ships delivered in 1990 were down substantially from 1989 when 21 naval and two Coast Guard vessels valued at \$5.1 billion were delivered.

Nine different types of ships were delivered by nine shipyards during 1990: 1 - ballistic missile submarine (SSBN); 2 - attack submarines (SSNs); 3 - guided missile cruisers (DDGs); 2 - dock landing ships (LSDs); 1 - ocean surveillance ship (TAGOS); 1 - fleet oiler (T-AO); 1 - deep ocean survey ship (TAGS); 2 - mine countermeasure ship (MCMs); and 1 - medium endurance cutter (WMEC) for the Coast Guard.

Exhibit 26

VESSELS DELIVERED IN 1990					
(1,000 LDT AND OVER)					
<u>Shipyard</u>	<u>Symbol No.</u>	<u>Vessel Name</u>	<u>LDT</u>	<u>Delivery Date</u>	<u>Contract Price (\$ MIL.)</u>
Avondale Industries	LSD-45	COMSTOCK	11,100	01/12/90	152.4
Halter Moss Pt.	T-AGOS 18	RELENTLESS	1,600	01/12/90	14.0
Newport News	SSN-753	ALBANY	6,000	03/23/90	278.0
Bath Iron Works	CG-61	MONTEREY	8,910	03/25/90	191.8
General Dynamics - EB	SSN-755	MIAMI	6,000	05/30/90	260.0
Avondale Industries	T-AO-197	PECOS	15,000	07/06/90	100.6
Robert E. Derector	WMEC-913	MOHAWK	1,200	07/23/90	38.0
Beth. Steel - SP	T-AGS-40	TANNER	8,810	08/27/90	66.4
Peterson Builders	MCM-8	DEVASTATOR	1,000	08/31/90	48.2
Avondale Industries	LSD-46	TORTUGA	11,100	09/07/90	152.4
General Dynamics - EB	SSBN-736	WEST VIRGINIA	12,500	09/10/90	535.4
Ingalls Shipbuilding	CG-65	CHOSIN	8,910	11/15/90	242.6
Bath Iron Works	CG-63	COWPENS	8,910	11/16/90	193.3
Peterson Builders	MCM-8	SCOUT	1,000	11/27/90	48.2
Total					\$2,321.3

NAVY'S T-SHIP PROGRAM

An important segment of ship construction and conversion activity for U.S. shipyards has been the Navy's T-ship program. T-ships are auxiliary vessels funded by the Navy budget but designed to be civilian-manned and under the control of the Military Sealift Command. Since mid-1979, 16 U.S. private shipyards have been awarded contracts for the construction of 51 new ships and the conversion of 31 existing vessels. The initial contract value for these vessels totaled almost \$5.2 billion.

During 1990, only one T-ship contract was placed with a U.S. shipyard. Avondale Industries received an order with an initial contract value of \$104.4 million to build an oceanographic survey ship (T-AGS 45).

Deliveries included an ocean surveillance ship (T-AGOS 18) by Halter Marine, Moss Point Mississippi; a fleet oiler (T-AO 19) by Avondale Industries, New Orleans, Louisiana; and a deep ocean survey ship (T-AGS 40) by Bethlehem Steel, Sparrows Point, Maryland. In addition, an auxiliary crane ship (T-ACS 9) was redelivered from conversion by Norfolk Shipbuilding and Drydock Corporation, Norfolk, VA.

As of January 1, 1991, 18 new ships were either under construction or on order at four shipyards (Exhibit 27). The value of this orderbook is approximately \$1.4 billion.

Exhibit 27

T-SHIPS ON ORDER				
(AS OF DECEMBER 31, 1990)				
<u>Shipyard</u>	<u>Navy No.</u>	<u>Vessel Name</u>	<u>Estimated Delivery Date</u>	<u>Contract Price (\$ in Mill.)</u>
Avondale	T-AO 198	BIG HORN	8/1991	109.60
Avondale	T-AO 200	GUADALUPE	7/1992	97.60
Avondale	T-AGS 45	WATERS	12/1992	104.40
Avondale	T-AO 199	TIPPECANOE	11/1992	106.30
Avondale	T-AO 201	PATUXENT	8/1993	106.30
Avondale	T-AO 202	YUKON	4/1993	97.50
Avondale	T-AO 204	RAPPAHANNOCK	1/1994	97.50
Avondale	T-AO 203	LARAMIE	6/1994	106.30
Halter	T-AGS 51	JOHN MCDONNELL	11/1991	14.00
Halter	T-AGS 52	LITTLEHALES	2/1992	11.50
McDermott	T-AGOS 20	ABLE	8/1991	19.80
McDermott	T-AGOS 19	VICTORIOUS	3/1991	25.40
McDermott	T-AGOS 22	LOYAL	8/1992	19.80
McDermott	T-AGOS 21	EFFECTIVE	3/1992	19.80
Avondale	T-AO 194	JOHN ERICSSON	1/1991	96.90
Avondale	T-AO 196	KANAWHA	4/1991	95.00
Tampa	T-AO 191	BENJAMIN ISHERWOOD	11/1991	111.25
Tampa	T-AO 192	HENRY ECKFORD	7/1992	111.25
Total				\$1,350.20

PROJECTED NAVY SHIPBUILDING PLAN

The original four year plan for FY 1991-1994, introduced in 1990, is subject to revisions as a result of high level Defense Department, Office of Management and Budget and Congressional reviews. The current projected U.S. Navy shipbuilding plan for fiscal years 1991 through 1994 includes the construction of about 58 new ships (Exhibit 28). More than \$45 billion was projected for the original 4-year plan, which included the construction of 78 naval ships. Shipyard contract value, however, corresponds to only about a third of this budget. The remainder is attributed to such items as Government-furnished equipment placed aboard the vessels and Government program costs.

The latest projected, publically available, Navy shipbuilding plan includes the construction of 7 - nuclear submarines (1-SSBN, 6-SSNs), 16 - guided missile destroyers (DDG-51), 3 - LSDs, and 2 - LHDs. This proposed shipbuilding program does not include the construction of any new nuclear aircraft carriers.

Exhibit 28

PROJECTED NAVY SHIPBUILDING PLAN					
Fiscal Years 1991 - FY 1994					
<u>Types of Ship</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>Total</u>
SSBN	1	0	0	0	1
SSN	1	2	1	2	6
DDG	4	4	4	4	16
LSD	1	1	1	0	3
LHD	1	0	1	0	2
MHC	2	2	2	1	7
TAGOS	0	2	3	0	5
AE	0	0	1	2	3
AGOS	0	1	0	2	3
ARS	0	0	0	1	1
AOE	1	0	3	0	4
AGOR	1	2	1	2	6
AR	0	0	0	1	1
TOTAL	12	14	17	15	58

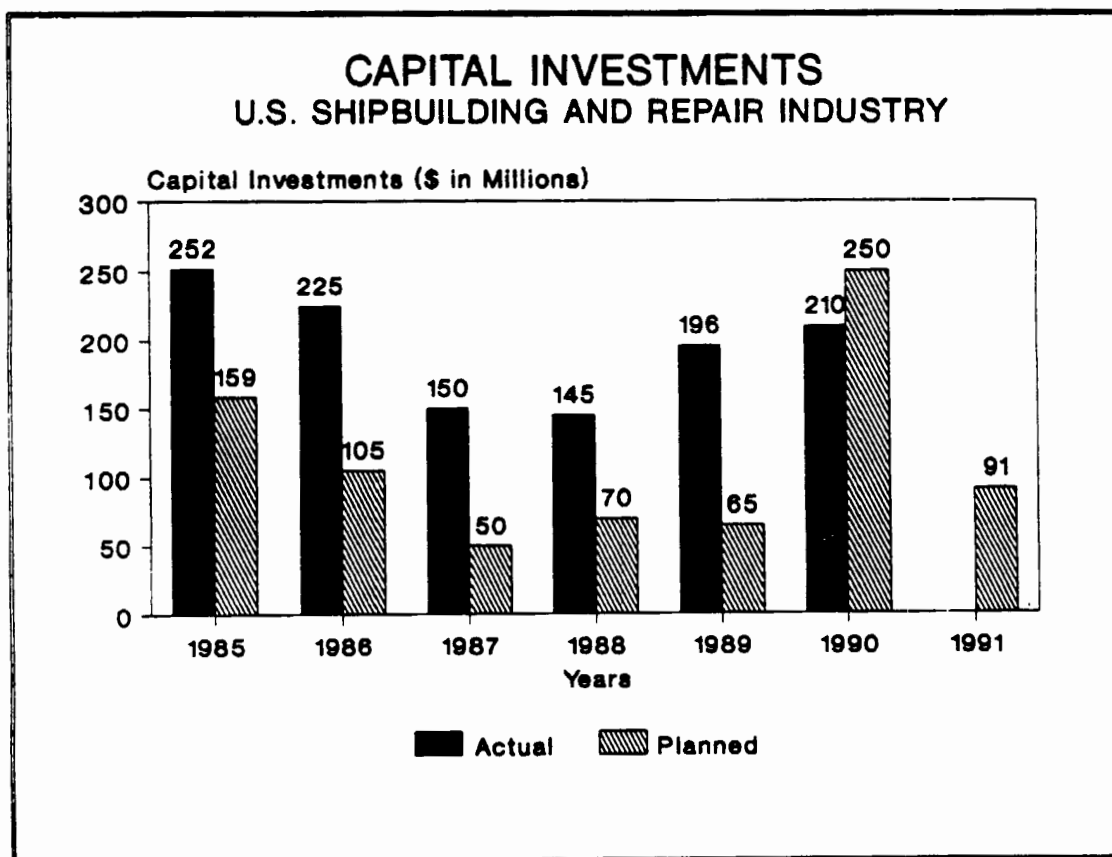
CAPITAL INVESTMENT

During FY 1990, the U.S. ship construction and ship repair industry invested more than \$210 million in the upgrade and expansion of facilities (Exhibit 29). Much of this investment was to improve efficiency and competitiveness in the Navy's construction, repair and overhaul projects, which are considered the most consistent and stable element in the industry's projected market.

In 1991, the industry plans to spend about \$91 million in the upgrade and expansion of facilities, according to data received by the Maritime Administration. The industry's capital investments since 1970 have totaled \$4.6 billion, and actual expenditures between 1985 and 1989 have consistently exceeded those planned.

These capital investments have included building basins, floating drydocks, cranes, automated equipment, and highly mechanized modular techniques - fabrication of large subassemblies and pre-outfitting of ship components.

Exhibit 29

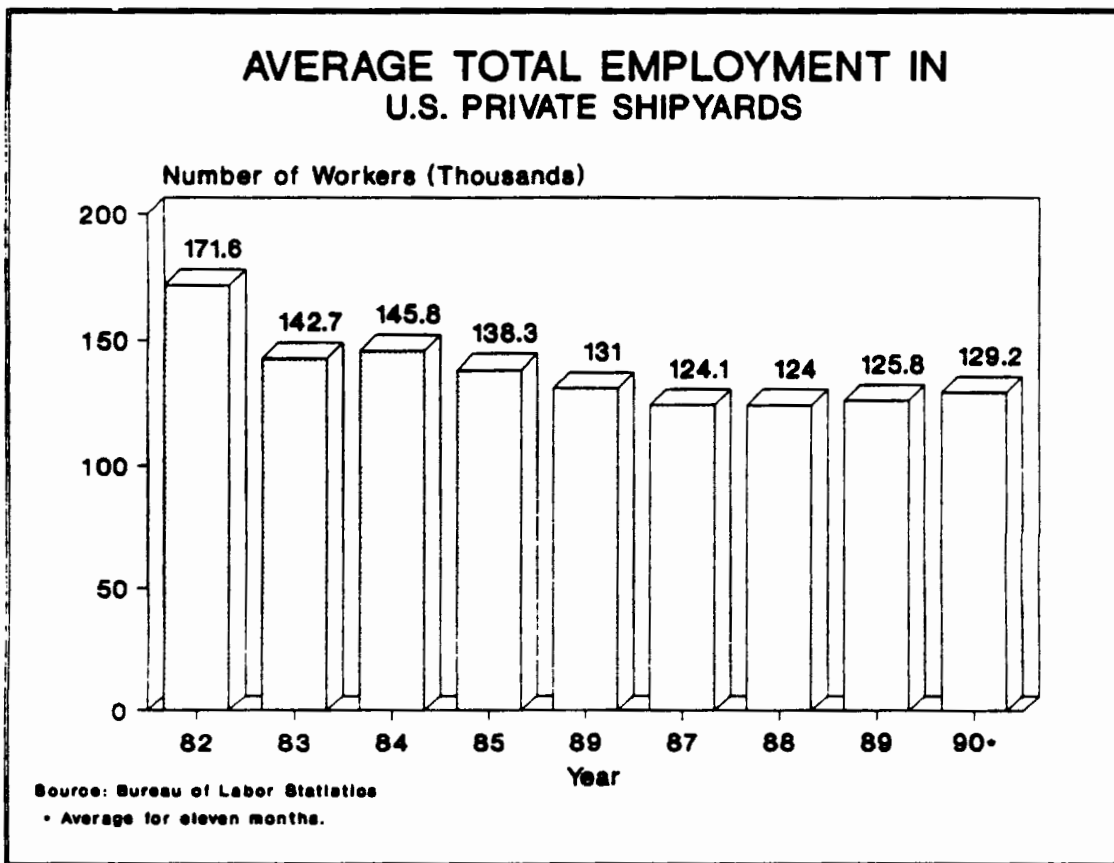


TOTAL EMPLOYMENT IN PRIVATE SHIPYARDS

According to preliminary employment data published by the Bureau of Labor Statistics (BLS), U.S. Department of Labor, under the Standard Industrial Classification (SIC) Code 3731 (Shipbuilding and Repairing), the average total employment in U.S. private shipyards for the first eleven months of 1990 was 129,200 (Exhibit 30). This was 2.7 percent higher than the reported total average employment reported for the shipbuilding and repairing industry for 1989.

According to the data published by the BLS, total average employment in the shipbuilding and repairing industry has been increasing slightly since 1988, but has remained considerably lower than that reported in 1982 when 171,600 people were employed in the industry.

Exhibit 30



AVERAGE EARNINGS IN U.S. PRIVATE SHIPYARDS

Average hourly earnings in the U.S. private shipyards are presented on a "gross" basis, reflecting not only changes in basic hourly and incentive wage rates, but also such variable factors as premium pay for overtime and late-shift work, as well as changes in output for workers paid on an incentive plan. Averages of hourly earnings differ from wage rates. Earnings are the actual return to the workers for a stated period of time; rates are the amount stipulated for a given unit or work or time. Gross average weekly earnings are derived by multiplying average weekly hours by average hourly earnings. Therefore, weekly earnings are affected not only by changes in gross average hourly earnings, but also by changes in the length of the workweek.

The annual average earnings in the private shipyards in the United States from 1982 through the first 11 months of 1990 show an increase from \$10.21 to an average of \$11.73 (Exhibit 31). During the same period of time the average weekly earnings rose from \$408.35 to \$483.07.

Exhibit 31

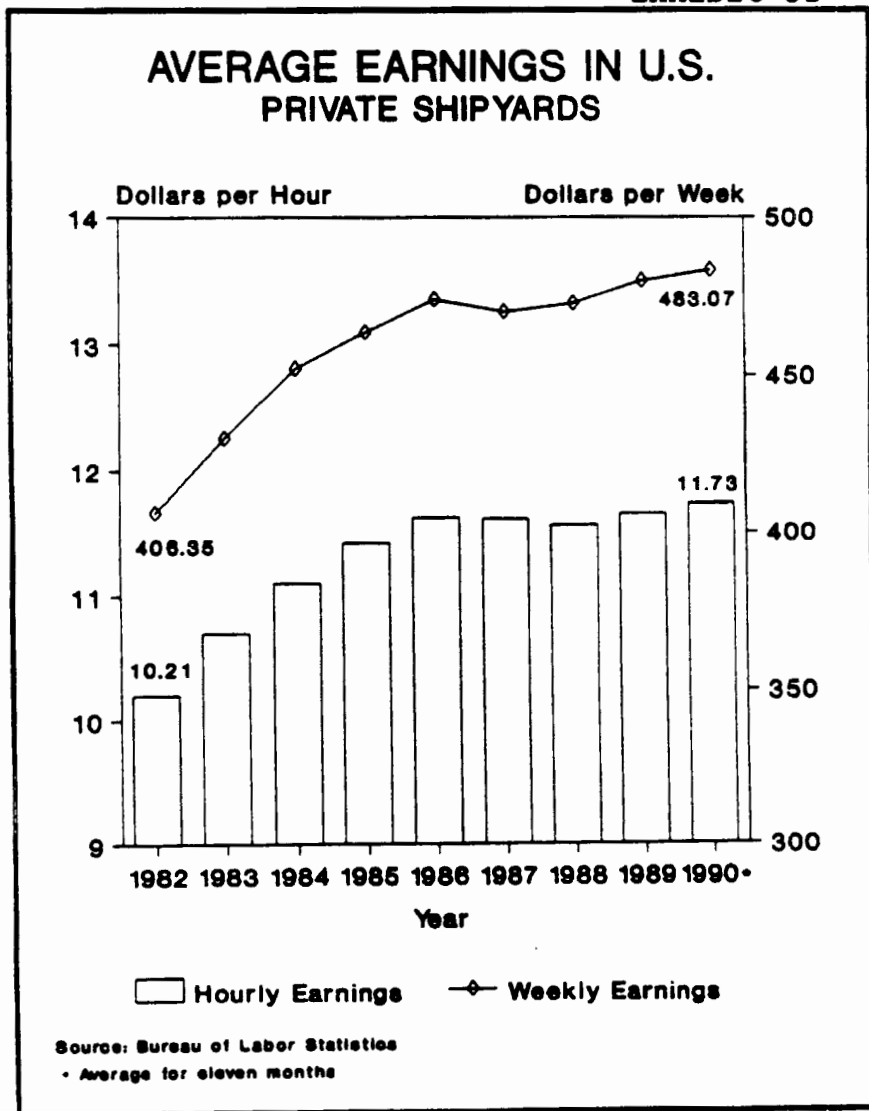


TABLE 1

SHIP CONSTRUCTION CAPABILITY

BY

SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

1/ LEGEND

Maximum Ship Size
(LOA x Beam)
SW = Shipway
GD = Graving Dock
FD = Floating Drydock
MR = Marine Railway
LL = Land Level Positior

SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SHIPYARD	BUILDING POSITION 1										Dry Bulk		
	Gen. Cargo 475 x 68	Mob. Cargo 724 x 105	Container 610 x 90	RO/RO 684 x 102	LASH 893 x 100	Container 947 x 105	21,300	51,000	100,000	600 x 105	900 x 105		
EAST COAST													
Bath Iron Works	1	0	1	0	0	0	1	0	0	0	0	0	0
(2) 700 X 130SW	3	0	3	2	0	0	3	0	0	0	2	2	0
Bethlehem Steel, Baltimore Marine Div.	2	2	2	2	0	0	2	2	2	0	4	2	0
(2) 800 X 106SW	4	1	3	2	1	1	4	2	4	1	6	2	1
1196 X 194GD	6	3	5	4	1	1	6	3	4	1	6	4	1
Newport News	2	1	2	1	1	1	2	1	2	1	2	1	1
958 X 121GD	2	1	2	1	1	1	2	1	2	1	2	2	1
1097 X 136GD	9	4	5	4	2	2	6	4	6	4	10	4	1
1609 X 246GD	13	6	9	6	4	4	10	6	10	7	17	7	3
GULF COAST													
Alabama Shipyard	4	0	0	0	0	0	0	0	0	0	0	0	0
(4) 523 X 90SW	4	0	0	0	0	0	0	0	0	0	0	0	0
Avondale	8	2	3	3	2	2	6	2	2	2	3	3	2
(2) 1020 X 175LL	2	2	2	2	0	0	2	0	0	0	2	2	0
(2) 870 X 126LL	10	4	5	5	2	2	8	2	2	2	5	5	2
Litton/Ingalls	25	11	13	11	0	0	16	0	0	0	11	11	0
(5) 844 X 260LL*	3	2	2	2	0	0	2	0	0	0	2	2	0
1540 X 180LL*	28	13	15	13	0	0	18	0	0	0	13	13	0

* Ship size constrained by maximum launching capability of 850' x 173'

1/ LEGEND

- Maximum Ship Size
(LOA x Beam)
- SW = Shipway
- GD = Graving Dock
- FD = Floating Drydock
- MR = Marine Railway
- LL = Land Level Position

SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SHIPYARD	BUILDING POSITION (Number)	General Cargo						Dry Bulk		
		Gen. Cargo 475 x 68	Mob. Cargo 724 x 105	Container 610 x 90	RO/RO 684 x 102	LASH 883 x 100	Container 947 x 105	21,300 570 x 75	51,000 600 x 105	100,000 900 x 105
Moss Point Marine	500 X 82SW	1	0	0	0	0	0	0	0	0
Tampa Shipyards	(2) 742 X 106GD	2	2	2	2	0	0	2	2	0
Trinity-Beaumont	875 X 105SW	1	1	1	1	1	0	1	1	0
WEST COAST										
National Steel & Shipbuilding Co.	680 X 90SW	1	0	1	0	0	0	0	0	0
	(2) 900 X 110SW	2	2	2	2	2	0	2	2	2
	980 X 170GD	4	1	1	1	1	1	2	1	1
Portland SRY	475 X 100LL 810 X 108LL	2	1	1	1	0	0	0	0	0
Todd-Seattle	600 X 96SW	1	0	0	0	0	0	1	0	0

1/ LEGEND

Maximum Ship Size
(LOA x Beam)
SW = Shipway
GD = Graving Dock
FD = Floating Drydock
MR = Marine Railway
LL = Land Level Position

SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SHIPYARD	BUILDING POSITION (Number)	Gen. Cargo 475 x 68	Mob. Cargo 724 x 105	Container 610 x 90	RO/RO 684 x 102	LASH 893 x 100	Container 947 x 105	21,300 570 x 75	51,000 600 x 105	100,000 900 x 105	Dry Bulk	
											General Cargo	Dry Bulk
GREAT LAKES *												
Fraser Shipyards	825 X 82GD	1	0	0	0	0	0	1	0	0	0	0
The Toledo Shipyard	540 X 68GD 680 X 78GD	0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0

* (NOTE: Maximum size ship that can exit the St. Lawrence Seaway is 730' x 78'.)

1/ LEGEND

Maximum Ship Size
(LOA x Beam)
SW = Shipway
GD = Graving Dock
FD = Floating Drydock
MR = Marine Railway
LL = Land Level Position

SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SHIPYARD	BUILDING POSITION (Number)	Tankers										O&O	
		25,000 620 X 75	38,000 888 X 90	89,000 894 X 105	120,000 920 X 138	125,000 932 X 140	225,000 1100 X 140	265,000 1100 X 178	80,000 866 X 105	160,000 998 X 143			
<u>EAST COAST</u>													
Bath Iron Works	650 X 88SW (2) 700 X 130SW	1 3	0 2	0 2	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Bethlehem Steel, Baltimore Marine Div.	(2) 800 X 106SW 1196 X 194GD	2 3	2 4	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1	0 1
Newport News	958 X 121GD 1097 X 196GD 1609 X 246GD	1 1 6	1 1 4	1 1 2	0 0 1	0 0 1	0 0 1	0 0 1	0 0 1	0 0 1	0 0 1	0 0 1	0 0 1
<u>GULF COAST</u>													
Alabama Shipyard	(4) 523 X 90SW	0	0	0	0	0	0	0	0	0	0	0	0
Avondale	(2) 1020 X 175LL (2) 870 X 126LL	3 4	3 6	2 2	2 2	2 2	1 1	1 1	1 1	1 1	1 1	2 2	1 1
Liton/Ingalls	(5) 844 X 260LL * 1540 X 180LL *	16 2 18	13 2 15	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 0	0 0 0

* Ship size constrained by maximum launching capability of 850' X 173' vessels.

1/ LEGEND

Maximum Ship Size
(LOA x Beam)
SW = Shipway
GD = Graving Dock
FD = Floating Drydock
MR = Marine Railway
LL = Land Level Position

SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SHIPYARD	Tankers										OBO
	25,000 620 X 75	38,000 688 X 90	89,000 894 X 105	120,000 920 X 138	125,000 932 X 140	225,000 1100 X 140	265,000 1100 X 178	80,000 886 X 105	160,000 998 X 143		
Moss Point Marine	0	0	0	0	0	0	0	0	0	0	0
Tampa Shipyards	2	2	0	0	0	0	0	0	0	0	0
Trinity-Beaumont	1	1	1	0	0	0	0	0	0	0	0
<u>WEST COAST</u>											
National Steel & Shipbuilding Co.	1	1	0	0	0	0	0	0	0	0	0
690 X 90SW	2	2	1	0	0	0	0	0	0	0	0
(2) 900 X 110SW	3	4	3	1	1	0	0	0	0	0	0
960 X 170GD	0	0	0	0	0	0	0	0	0	0	0
Portland SRY	1	1	0	0	0	0	0	0	0	0	0
475 X 100LL	1	1	0	0	0	0	0	0	0	0	0
810 X 108LL	0	0	0	0	0	0	0	0	0	0	0
Todd-Seattle	0	0	0	0	0	0	0	0	0	0	0
600 X 96SW	0	0	0	0	0	0	0	0	0	0	0

1/ LEGEND

Maximum Ship Size
(LOA x Beam)
SW = Shipway
GD = Graving Dock
FD = Floating Drydock
MR = Marine Railway
LL = Land Level Position

SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SHIPYARD	Tankers										OBO
	25,000 620 X 75	38,000 688 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	80,000 886 X 105	160,000 998 X 143		
<u>GREAT LAKES</u> *											
Fraser Shipyards	1	0	0	0	0	0	0	0	0	0	
The Toledo Shipyard	0	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	0	0	

* (NOTE: Maximum size ship that can exit the St. Lawrence Seaway is 730' X 78'.)

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SUMMARY

REGION	General Cargo						Dry Bulk				
	Gen Cargo 475 X 68	Mob. Cargo 724 X 105	Container 610 X 90	RO/RO 684 X 102	LASH 893 X 100	Container 947 X 105	21,300 570 X 75	51,000 600 X 105	100,000 900 X 105		
EAST COAST	23	9	18	12	5	5	20	13	4		
GULF COAST	46	20	23	21	3	2	29	21	2		
WEST COAST	10	4	5	4	3	1	7	4	3		
GREAT LAKES *	2	0	0	0	0	0	1	0	0		
TOTAL POSITIONS - ALL YARDS	81	33	46	37	11	8	57	38	9		
REGION	Tankers						OBO				
	25,000 620 X 75	38,000 688 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	80,000 886 X 105	160,000 998 X 143		
EAST COAST	17	13	5	2	2	2	2	5	2		
GULF COAST	28	24	3	2	2	1	1	2	1		
WEST COAST	6	5	3	1	1	0	0	3	0		
GREAT LAKES *	1	0	0	0	0	0	0	0	0		
TOTAL POSITIONS - ALL YARDS	52	42	11	5	5	3	3	10	3		

* (NOTE: Maximum size ship that can exit the St. Lawrence Seaway is 730' X 78'.)

TABLE 2

NUMBER OF SHIPBUILDING WAYS BY LENGTH
(MAXIMUM SHIP SIZE)

NUMBER OF BUILDING WAYS BY LENGTH (MAXIMUM SHIP SIZE) *

Length OA (In Feet):	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1300	1400	1600
<u>EAST COAST</u>																				
Bath Iron Works	3	3	3	3	3	3	2	3	3	3	1	1	1	1	1	1				
Beth-Baltimore Marine Division	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1
General Dynamics, E. Boat **	1	1	1																	
Intermarine	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1
Newport News SB & DD	(10)	(10)	(10)	(9)	(9)	(9)	(8)	(6)	(6)	(4)	(4)	(4)	(3)	(3)	(2)	(2)	(1)	(1)	(1)	(1)
TOTAL																				

GULF COAST

Alabama Shipyards	1	1	1																	
Avondale Shipyards	6	6	5	5	5	5	5	5	5	2	2	2	2							
Ingalls	6	6	6	6	6	6	6	6	4	3										
Moss Point Marine	1	1	1																	
Tampa Shipyards	2	2	2	2	2	2	2	1	1	1	1									
Trinity Industries	1	1	1	1	1	1	1	1	1	1										
TOTAL	(17)	(17)	(16)	(14)	(14)	(14)	(14)	(12)	(10)	(6)	(2)	(2)	(2)	(2)						

WEST COAST

National Steel & SB	4	4	4	4	4	4	3	3	3	3	3	3	1							
Portland Ship Repair	2	2	1	1	1	1	1	1	1											
Tacoma Boat	4																			
Todd-Seattle	1	1	1	1	1	1														
TOTAL	(11)	(7)	(6)	(6)	(5)	(4)	(4)	(4)	(3)	(3)	(3)	(1)								

GREAT LAKES ***

Fraser Shipyards	2	2	2	2	2	1	1	1	1											
Marinette Marine	1																			
Peterson Builders	1																			
Toledo Shipyard	2	2	2	1	1	1														
TOTAL	(6)	(4)	(4)	(3)	(3)	(2)	(1)	(1)	(1)											

GRAND TOTAL ALL COASTS AND GREAT LAKES	(44)	(38)	(36)	(32)	(32)	(30)	(27)	(23)	(21)	(13)	(9)	(7)	(5)	(3)	(2)	(2)	(1)	(1)	(1)	(1)
--	------	------	------	------	------	------	------	------	------	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

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

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 units of measure notated under legend)	CRANES SERVING BERTHS, ETC.	
			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

BIROCKS (mean high water) (List building decks under building ways)

DOCK NO.	MATERIAL CONSTD. OF—TYPE Floating—(FD); Graving—(GD); Marine Railway—(MR)	MAXIMUM SHIP SIZE ACCOMMODATED LENGTH ON—BEAM	LENGTH			CLEAR WIDTH			DEPTH/DRAFT			LIFTING CAPACITY (Ton 2,240 lbs.)
			Overall	At coping (GD); on pontoons (FD)	At keel blocks; on cradles (MR)	At top; cradles (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/MR—P.S.I.
 Air..... A—C.F.M.—P.S.I.
 Electric power..... E—V—AC—AMP
 Electric power..... E—V—DC—AMP
 Fire protection..... Fire protection
 Sanitary sewer..... Sanitary sewer
 FP—G.P.M.—P.S.I.
 SS—Yes or 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 in ft.	Boom length	Capacity at reach		Max. reach									
			Width	Height																
Fabricating																				
Plate					X X X X															
Sheet metal																				
Subassembly																				
Carpenter					X X X X															
Woodworking					X X X X															
Boat assembly or molding																				
Machine					X X X X															
Electrical					X X X X															
Electronic					X X X X															
Pipe																				
Galvanizing																				
Foundry																				
Rigger					X X X X															

NOTE - Indicate materials as steel, aluminum, reinforced plastic, wood, plywood, sheet metal, etc

BRIDGE TYPE				SHOP OR YARD CRANES (5 tons or over)						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 in ft.	Area serviced	Height of hook above base at max. 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)

RAW STEEL STORAGE (Sq. ft.) **WELDING AND ASSEMBLY (Sq. ft.)**

ACREAGE LEGALLY CONTROLLED

IN USE **DEVELOPED (including in use)** **TOTAL (including undeveloped)**

EXISTING LOCAL ORDINANCES LIMITING PRODUCTIVE USE

LIMITATIONS IMPOSED BY PROPERTY ZONING CLASSIFICATION

YARD LAYOUT—PLEASE FURNISH A PLOT PLAN OF YARD OR PLANT, IF AVAILABLE

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

EMPLOYMENT	CURRENT	CURRENT AND SHIFTS		MORILIZATION—SHIFTS	
		Yes	No	Yes	No
Management, administration					
Professional, engineering					
Professional, technical (All others)					
Production, skilled					
Production, semiskilled					
Production, unskilled					
Nonproduction					
Total		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 11 OF STD. FORM 129 (NOTE—An affiliate is a 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 OVERLAID TRANSPORTATION OF FINISHED PRODUCTS (Do not 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)

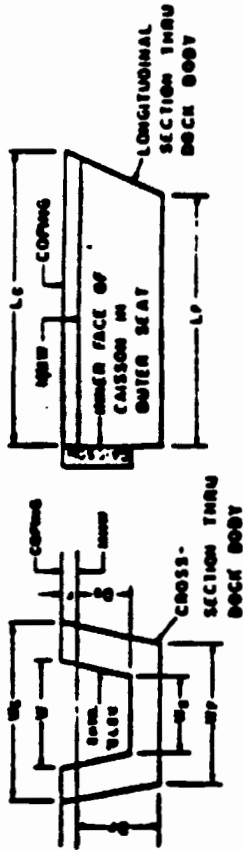
LIMITING LOCK DIMENSIONS TO TIDEWATER (Identify locks)

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 conversion or industrial manufacturing work considered comparable to ship or boat construction.)

CRAWLING DRYDOCK CHARACTERISTICS SUMMARY

CRAWLING DRYDOCK NOMENCLATURE



- KEY**
- MM - Mean High Water
 - DF - Depth of Dock from MM to Floor
 - DS - Depth of Dock from MM to sill
 - LC - Length of Dock at coping
 - LF - Length of Dock at Floor
 - M - Width of Dock at top of entrance
 - MC - Width of Dock at coping or minimum clear width above Dock Floor
 - MF - Width at Dock Floor
 - MS - Width of Dock at entrance (sill)
 - F - Foreboard. Distance from MM to top of coping. Indicate if part of F may be superfluous.

DRY DOCK NUMBER	LENGTH		ENTRANCE DIMENSIONS:		DOCK BODY DIMENSIONS			STANDARD DEFINITION	A.C. AMPERES (60 Hz. 30)		REMARKS (e.g. Indicate dimensions of pile in dock floor)
	FLOOR	TOP	SILL	COPING	WIDTH	DEPTH	FOREBOARD		480V	2400V	
	L_1	L_2	S_1	M	M_1	D_1	D_2	F	Max. Hotel (Indus)	Alt. Hotel	

Alternate Hotel Service Consists of 2400 V Supply and 1000 KVA (480V SEC.) Portable Transformer, 480V Supply and 1.750 KVA (480V SEC.) Portable Transformer,

FLOATING DRYDOCK CHARACTERISTICS SUMMARY

FLOATING DRYDOCK	MAXIMUM LENGTH OF PUNTOON	MAXIMUM DEPTH OVER BLOCKS	CLEAR WIDTH BETWEEN WINGWALLS	LIFT CAPACITY (TONS)	NORMAL KEEL BLOCK HEIGHT	A.C. AMPHERES (60HZ-30)			REMARKS (Indicate existence of hauling blocks, if end selection can be lowered, and max. length of ship DD can accommodate).
						480V MAX. HOTEL (Indus.)	2400V ALT. HOTEL	13.2KV TEST/ CHECK	



APPENDIX B

MAJOR U.S. SHIPBUILDING, REPAIR (WITH
DRYDOCKING), AND TOPSIDE REPAIR FACILITIES

MAJOR U.S. SHIPBUILDING, REPAIR (WITH
DRYDOCKING), AND TOPSIDE REPAIR FACILITIES

CLASSIFICATION DEFINITIONS

- **Shipbuilding**: Facilities that are open, having at least one shipbuilding position, either an inclined way, a side-launching platform, or a building basin capable of accommodating a minimum ship size of 400' in length. With few exceptions, these shipbuilding facilities are also major repair facilities with drydocking capability.
- **Repair (With Drydocking)**: Drydocking facilities for ships 400' in length and over. These facilities may also be capable of constructing vessels less than 400' in length.
- **Topside Repair**: Facilities with sufficient berth/pier space for topside repair of ships 400' in length and over. These facilities may also be capable of constructing and/or drydocking vessels less than 400' in length.

GENERAL REQUIREMENTS

The shipyard must own or have in place a long term lease (1 year or more) on the facility in which they intend to accomplish the work.

There must be no dimensional obstructions in the waterway leading to open ocean (i.e., locks, bridges).

Water depth in the channel to the facility must be a minimum of 12 feet.

NOTE

The following criteria were developed to establish the maximum ship size that could be accommodated in each drydock:

For floating drydocks, the maximum ship length is as given by the shipyards. The maximum beam was determined by allowing a two-foot (.6 m) clearance at each side between the ship and wing wall.

For graving docks, the maximum ship length was determined by allowing a two-foot (.6 m) clearance at each end between the ship and the inside of the dock at the floor. The maximum beam was determined by allowing a two-foot (.6 m) clearance on each side between the ship and each side of the dock entrance at the sill, unless the shipyard indicated more clearance is required.

There are several types of floating drydocks and graving docks, and 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 U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam) SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Berths/Piers Usable Length in feet <u>Longest</u> Total linear feet	Remarks 1/ Type of work usually engaged in 2/ Employment - Mid-1990
<u>EAST COAST</u>			
Shipbuilding Yards			
Bath Iron Works 700 Washington Street Bath, ME 04530	(2) 650 X 88 SW 700 X 130 SW	<u>850</u> 2150	1/ Construction, conversion and repairs - all types of vessels. 2/ 10,516
Bethlehem Steel Corp. Baltimore Marine Division Sparrows Point, MD 21219	(2) 800 X 106 SW 1196 X 194 GD 900 X 131 FD	<u>1260</u> 3969	1/ Construction, conversion and repairs of marine vessels. 2/ 1,107
General Dynamics Electric Boat Division Eastern Point Road Groton, CT 06340		<u>750</u> 3508	1/ Engaged exclusively in construction of submarines for the U.S. Navy. 2/ 22,247
Intermarine, USA 301 North Lathrop Avenue P.O. Box 3045 Savannah, GA 31402	533 X 63 GD	<u>400</u> 780	1/ MHC construction. 2/ 485
Newport News Shipbuilding & Drydock Company 4101 Washington Avenue Newport News, VA 23607	958 X 121 GD * 1097 X 136 GD * 646 X 88 GD ** 858 X 102 GD ** 455 X 68 GD ** 521 X 68 GD ** 1609 X 246 GD * 640 X 136 FD	<u>1370</u> 13620	1/ Construction, conversion and repairs - all types of vessels. 2/ 25,945 * Used for construction. ** Used for repair and overhaul.

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks
	SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Longest Total linear feet	
<u>EAST COAST</u>			
Repair Yards with Drydock Facilities			
Atlantic Drydock Corp. P.O. Box 138 Fort George Island, FL 32226	500 X 90 MR	<u>585</u> 2070	1/ Construction of small vessels. Repair and overhaul of small and medium size vessels. 2/ 429 * * Includes Atlantic Marine's Fort George Island employees.
Bath Iron Works Corp. 40 Commercial St. Portland, ME 04101	844 X 136 FD	<u>1000</u> 1500	1/ Ship repairs and conversion. 2/ 1,300
Boston Graving Dock Corp. 256 Marginal Street East Boston, MA 02128	425 X 76 FD	<u>1020</u> 3111	1/ General ship repair. 2/ 85
Boston Marine Industrial Park (E.D.I.C.) 38 Chauncy Street Boston, MA 02211	1149 X 111 GD	<u>900</u> 1600	1/ Leases public drydock in former Boston Naval Annex to local ship repair companies. 2/ N/A
Caddell Drydock & Repair Company P.O. Box 327 Staten Island, NY 10310	450 X 68 FD	<u>946</u> 3082	1/ General ship repair. 2/ 178
Colonna's Shipyard, Inc. 400 E. Indian River Rd. Norfolk, VA 23523	420 X 70 MR 650 X 86 FD	<u>900</u> 2675	1/ General ship repairs. 2/ 333
Detyens Shipyard Rt. 2, Box 180 Mt. Pleasant, SC 29464	500 X 83 FD	<u>510</u> 1022	1/ General ship repair and conversion. 2/ 300
G. Marine Diesel of New York P.O. Box 050221 Brooklyn, NY 11205	(2) 1082 X 141 GD	<u>765</u> 765	1/ General ship repair. 2/ 75
General Ship Corp. 400 Border Street East Boston, MA 02128	683 X 78 GD *	<u>900</u> 2530	1/ Ship repairs, overhauls and modernizations. 2/ 297 * GD is long-term leased from Boston Marine Industrial Park in the former Boston Naval Annex.

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks
	SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Longest Total linear feet	
<u>EAST COAST</u>			
Repair Yards with Drydock Facilities			
Jacksonville Shipyards Bellinger Division 13911 Atlantic Blvd. Jacksonville, FL 32211	400 X 53 FD	355 <u>922</u>	1/ Ship repair and conversion. 2/ 175
Metro Machine Corp. P.O. Box 1860 Norfolk, VA 23501	675 X 95 FD	785 <u>2790</u>	1/ Ship repairs and conversion. 2/ 650
New York Shipyard Corp. One Beard St. Brooklyn, NY 14231	712 X 89 GD 710 X 106 FD 475 X 77 FD 600 X 96 FD	1152 <u>4200</u>	1/ General ship repairs. 2/ 400
Norfolk Shipbuilding & Drydock Corporation P.O. Box 2100 Foot of Liberty Street Norfolk, VA 23501	750 X 96 FD 1036 X 156 FD	1030 <u>7825</u>	1/ Ship conversion and repairs - all types of vessels. 2/ 2,845
North Florida Shipyards P.O. Box 3255 Jacksonville, FL 32206	500 X 66 FD	950 <u>3240</u>	1/ Ship repairs and conversion. 2/ 533
Robert E. Derecktor of Rhode Island, Inc. Coddington Cove Middleton, RI 02840	650 X 106 FD 400 X 106 FD	1525 <u>4525</u>	1/ Construction of Coast Guard ships and vessel repairs. 2/ 598

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks
	SW--Shipway GD--Graving Drydock FD--Floating Drydock MR--Marine Railway LL--Land Level Position SL--Syncrolift	Longest Total linear feet	
<u>EAST COAST</u>			
<u>Topside Repair Yards</u>			
Associated Naval Architects 3400 Shipwright Street Portsmouth, VA 23703		400 1390	1/ General ship repair and overhaul. 2/ 91
Braswell Shipyards 60 Braswell St. Charleston, SC 29405		720 1080	1/ Ship repairs and conversion. 2/ 350
Delta Marine, Inc. P.O. Box 2191 Wilmington, NC 28402		900 1400	1/ General ship repair. 2/ 71
Eastern Technical Enterprises 2429 Ferry Rd. Virginia Beach, VA 23455		600 600	1/ Ship repair, overhaul, and modification. 2/ 69
General Ship Repair Corp. 1449 Key Highway Baltimore, MD 21230		435 845	1/ General ship repair. 2/ 50
Gowen, Inc. 72 Commercial Street Portland, ME 04104		500 1500	1/ General ship repair. 2/ 10
JOMAR Corporation of Tidewater P.O. Box 5119 Suffock, VA 23435		600 600	1/ General ship repair. 2/ 62
Jonathan Corporation Little Creek Shipyard Virginia Beach, VA 23455		558 1116	1/ General ship repair and overhaul. 2/ 190
Jonathan Corporation 701 Front Street Norfolk, VA 23510		700 1106	1/ Ship repair and overhaul. 2/ 442
Marine Hydraulics International, Inc. 800 East Indian River Rd. Nortolk, VA 23523		600 1300	1/ General ship repair. 2/ 304
Melville Marine Industries One Little Harbor Landing Portsmouth, RI 02871		1200 1200	1/ General ship repair. 2/ 190

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam) SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Berths/Piers Usable Length in feet <u>Longest</u> <u>Total linear</u> feet	Remarks 1/ Type of work usually engaged in 2/ Employment - Mid-1990
<u>EAST COAST</u>			
Topside Repair Yards			
Metal Trades, Inc. P.O. Box 129 Hollywood, SC 29449-0129		320 * 560	1/ General ship repair. 2/ 261 * Can do topside repair to vessel 400' in length.
Moon Engineering 545 Front Street Norfolk, VA 23510		550 550	1/ General ship repair, primarily for Navy. 2/ 95
Moon Engineering Two Harper Avenue Portsmouth, VA 23707		613 1226	1/ General ship repairs. 2/ 190
M & W Marine Service, Inc. 601 Jefferson Ave. Newport News, VA 23607-6113		600 600	1/ General ship repair. 2/ 35
Newport Offshore, Ltd. One Washington Street Newport, RI 02840		2400 * 5300	1/ General ship repair. 2/ 100 * Includes Quonset Point facility.
Norfolk Shipbuilding & Drydock Corporation Brambleton Division Norfolk, VA 23501		600 4109	1/ Ship conversion and repairs - all types of vessels. 2/ 542
Promet Marine Services Corp. 242 Allens Ave. Providence, RI 02905		750 2250	1/ General ship repair. 2/ 30
Reynolds Shipyard Corp. 200 Edgewater Street P.O. Box 0500/10 Staten Island, NY 10305		440 440	1/ General ship repairs. 2/ 25
Steel Style, Inc. 401 South Water Street Newburgh, NY 12550		500 600	1/ General ship repair. 2/ 23

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks
	SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Longest Total linear feet	

EAST COAST

Topside Repair Yards

Swygert Shipyard, Inc. P.O. Box 308 St. John's Island, SC 29455		500 1390	1/ General ship repair. 2/ 175
Virginia Drydock 307 Campostella Rd. Norfolk, VA 23523		500 1000	1/ General ship repair. 2/ 29

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam) SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Berths/Piers Usable Length in feet Longest Total linear feet	Remarks 1/ Type of work usually engaged in 2/ Employment - Mid-1990
<u>GULF COAST</u>			
Shipbuilding Yards			
Alabama Shipyard, Inc. P.O. Box 3201 Mobile, AL 36652	523 X 90 SW	1075 2107	1/ Ship construction, conversion and repairs. 2/ 190
Avondale Industries, Inc. P.O. Box 50280 New Orleans, LA 70150-0280	(2) 1020 X 175 LL * 1000 X 216 FD * (2) 870 X 126 LL ** 870 X 126 SW ** 3/ 750 X 114 FD ** 450 X 90 SW ***	3301 4694	1/ Modular ship construction, conversion, and repairs - all types of vessels. 2/ 6,512 3/ Can accommodate ship up to 1200 feet in length. * Upper main yard. ** Lower main yard. *** Westwego Plant.
Litton/Ingalls Shipbuilding Division P.O. Box 149 Pascagoula, MS 39568-0149	850 X 173 FD * (5) 844 X 260 LL * 1540 X 180 LL *	2650 9850	1/ Construction, conversion, and repairs - all types of vessels. 2/ 12,978 * West Bank can only launch ships up to 850' X 173'. Land Level Positions constrained by launching capability.
Moss Point Marine P.O. Box 1310 Escatawpa, MS 39552	500 X 82 SW	1075 1075	1/ Construction, conversion and repair of ships, boats, barges. 2/ 329
Tampa Shipyards, Inc. P.O. Box 1277 Tampa, FL 33601	542 X 72 GD* 896 X 146 GD* (2) 742 X 106 GD**	845 3620	1/ Ship construction, conversion and repairs. 2/ 830 * Used for ship repair. ** Used for ship construction.
Trinity Industries - Beaumont Division P.O. Box 3600 Beaumont, TX 77704	875 X 105 SW	1075 3415	1/ Ship construction, conversion and repair. 2/ 57

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks
	SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	<u>Longest</u> Total linear feet	
<u>GULF COAST</u>			
Repair Yards with Drydock Facilities			
Atlantic Marine, Inc. - Mobile P.O. Box 3202 Mobile, AL 36652	620 X 86 FD	<u>1050</u> <u>4000</u>	1/ Ship repairs and overhaul. 2/ 300
Bender Shipbuilding & Repair Co., Inc. 265 South Water Street Mobile, AL 36601	660 X 89 FD 414 X 55 FD 414 X 45 FD	<u>617</u> <u>1784</u>	1/ Construction of vessels up to 300' in length. Also repairs and conversion. 2/ 550
Bethlehem Steel Corp. Sabine Yard P.O. Box 1448 Port Arthur, TX 77641	900 X 118 FD	<u>700</u> <u>700</u>	1/ Repair of ships and offshore oil rigs. 2/ 240
Bludworth Bond Shipyard P.O. Box 5065 Houston, TX 77262	435 X 80 FD *	<u>650</u> <u>1080</u>	1/ General ship repairs. 2/ 150 * Two drydocks are combined.
Gulf Marine Repair 1200 Sertoma Drive Tampa, FL 36605	500 X 97 FD	<u>800</u> <u>1100</u>	1/ Ship repairs and overhaul. 2/ 147
International Ship Repair & Marine Service, Inc. 1616 Perry Street Tampa, FL 33605	546 X 104 FD	<u>1000</u> <u>2170</u>	1/ General ship repair. 2/ 105
Newpark Shipbuilding 8502 Cypress Houston, TX 77012	425 X 80 FD	<u>500</u> <u>1600</u>	1/ Small vessel construction and repairs. 2/ 275
Texas Drydock, Inc. P.O. Box 968 Orange, TX 77631-0968	500 X 120 FD	<u>900</u> <u>900</u>	1/ General ship repair. 2/ 150

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks 1/ Type of work usually engaged in 2/ Employment - Mid-1990
	SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Longest Total linear feet	
<u>GULF COAST</u>			
Topside Repair Yards			
American Marine Corp. 3900 Jourdan Rd. New Orleans, LA 70182		800 800	1/ Construction and repair of offshore oil vessels and barges 2/ 216
AMFELS, Inc. P.O. Box 3107 Brownsville, TX 78520		1200 1200	1/ General ship repair. 2/ 750
Avondale Industries, Inc. Algiers Division 3103 Patterson Drive New Orleans, LA 70114		1930 3648	1/ Ship conversion, repair, and overhaul. 2/ 98
Boland Marine Manufacturing P.O. Box 53287 New Orleans, LA 70153		1040 1040	1/ General ship repairs. 2/ 95
Bollinger Machine Shop and Shipyard P.O. Box 250 Lockport, LA 70374		5400 12180	1/ Coast Guard vessel construction. 2/ 546. * Max ship capability = 400' LOA.
Buck Kreihs Co. P.O. Box 53305 2225 Tchoupitoulas St. New Orleans, LA 70153-3305		1120 1120	1/ Ship repairs and conversion. 2/ 95 * Max ship capability = 400 feet.
Coastal Marine Service of Texas 1051 Houston Avenue Port Arthur, TX 77640		0 * 0	1/ General ship repair. 2/ 100 (subcontracted) * Vessels berthed alongside waterfront barges.
Dixie Machine Welding P.O. Box 53355 New Orleans, LA 70153		1333 1333	1/ General ship repairs. 2/ 150
Fredeman Shipyard P.O. Box 129 Sulphur, LA 70663		450 1700	1/ Construction and repair of offshore vessels. 2/ 91

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks 1/ Type of work usually engaged in 2/ Employment - Mid-1990
	SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Longest Total linear feet	
<u>GULF COAST</u>			
Topside Repair Yards			
Gulf Copper & Manufacturing Corp. 320 Houston Avenue Port Arthur, TX 77641		850 <u>2000</u>	1/ General ship repair. 2/ 108
Halter Marine, Inc. Equitable Division P.O. Box 8001 New Orleans, LA 70182		400 <u>1318</u>	1/ Construction and repair of small vessels and barges. 2/ 190
Hendry Corp. P.O. Box 13288 5107 S. Westshore Blvd. Tampa, FL 33611		1000 <u>1000</u>	1/ General ship repairs. 2/ 112
Houston Ship Repair, Inc. 16201 Wood Drive Houston, TX 77530		750 <u>750</u>	1/ General ship repair and conversion. 2/ 463
J. Bludworth, Inc. 3103 N. Navigation Blvd. Corpus Christi, TX 78401		487 <u>1500</u>	1/ General ship repair. 2/ 44
McDermott, Inc. P.O. Box 188 Morgan City, LA 70381		470 <u>1190</u>	1/ Construction and repair of tugs, supply boats, barges, and drill rigs. 2/ 955
Textron Marine Systems 6800 Plaza Drive New Orleans, LA 70127-2956		900 <u>1500</u>	1/ LCAC construction. 2/ 768
Vessel Repair, Inc. P.O. Box 2207 Port Arthur, TX 77640		1100 <u>2100</u>	1/ General ship repair. 2/ 75
Violet Dock Port, Inc. P.O. Box 357 Violet, LA 70092		1000 <u>4700</u>	1/ General ship repair. 2/ 40

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks
	SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Longest Total linear feet	
WEST COAST			
Shipbuilding Yards			
National Steel & Shipbuilding Co. Harbor Drive & 28th St. P.O. Box 85278 San Diego, CA 92138	690 X 90 SW (2) 900 X 110 SW 980 X 170 GD 750 X 137 FD	1000 <u>7250</u>	1/ Construction, conversion, and repairs - all types of vessels. 2/ 3,950 Graving dock and piers at U.S. Naval Station also leased, as required.
Portland Ship Repair Yard 5555 N. Channel Avenue P.O. Box 3529 Portland, OR 97208	475 X 100 LL 810 X 108 LL 650 X 84 FD 810 X 108 FD 1150 X 101 FD	1100 <u>10600</u>	1/ Ship construction, repair and conversion - all types of vessels. 2/ 3,135 * * Includes employees of lessors.
Facilities also leased by: 1. Cascade General, Inc. 2. Northwest Marine, Inc. 3. West State, Inc.			
Tacoma Boatbuilding 1840 Marine View Drive Tacoma, WA 98422	(2) 425 X 45 SW * (2) 430 X 50 SW *	680 <u>1375</u>	1/ Ship construction, repairs, and conversion - all types of vessels. 2/ 420 * Vessel with beam up to 98 feet can be constructed by joining the two shipways.
Todd Pacific Shipyards Seattle Division 1801-16th Avenue, S.W. Seattle, WA 98124	600 X 96 SW * 420 X 62 FD 650 X 84 FD 943 X 133 FD	1400 <u>6017</u>	1/ Ship construction, repairs, and conversion - all types of vessels. 2/ 2,552 * Max. ship size is 600' X 96' using two 450' X 50' SWs.

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks
	SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Longest Total linear feet	
WEST COAST			
Repair Yards with Drydock Facilities			
AK-WA, Inc. 401 Alexander-Bldg. 588 P.O. Box 872 Tacoma, WA 98421	500 X 84 FD 516 X 80 FD	650 1750	1/ Ship repair and conversion. 2/ 118
Maritime Contractors, Inc. 201 Harris Avenue Bellingham, WA 98225	400 X 60 FD	1300 3300	1/ General ship repair. 2/ 152
Pacific Drydock & Repair Co. 321 & 1441 Embarcadero Oakland, CA 94606	400 X 52 FD	600 1150	1/ Ship and barge repairs. 2/ 50
Southern Oregon Marine P.O. Box 1220 Coos Bay, OR 97420	400 X 100 MR	400 400	1/ General ship repair and barge construction. 2/ 114
Southwest Marine, Inc. P.O. Box 13308 Foot of Sampson St. San Diego, CA 92113-0308	655 X 104 FD 418 X 58 FD	700 2972	1/ Ship repairs, overhaul, and conversion. 2/ 1,194 Graving dock at Naval Station can be leased as required.
Southwest Marine, Inc. San Pedro Division 985 S. Seaside Terminal Island, CA 90731-7331	720 X 93 FD 420 X 54 FD 700 X 96 FD	1796 3661	1/ Ship repairs, overhaul, and conversion. 2/ 1,132
Southwest Marine of San Francisco P.O. Box 7644 San Francisco, CA 94120-7644	950 X 148 FD 700 X 97 FD	800 4885	1/ Ship repairs and overhaul. 2/ 456
United Marine Shipbuilding, Inc. 1441 N. Northlake Drive N. Seattle, WA 98103	400 X 57 FD	200 200	1/ General ship repairs. 2/ 124

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks
	SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Longest Total linear feet	1/ Type of work usually engaged in 2/ Employment - Mid-1990
WEST COAST			
Topside Repair Yards			
Billfish, Inc. Berth 44, Outer Harbor San Pedro, CA 90731		620 620	1/ General ship repair. 2/ 90
Campbell Industries P.O. Box 1870 501 E. Harbor Drive San Diego, CA 92112		640 2185	1/ General ship repair and construction of vessels up to 300' in length. 2/ 643
Commercial Marine Service, Inc. 258 Cannery Street Terminal Island, CA 90731		420 840	1/ General ship repair. 2/ 12
Continental Maritime of San Diego 1995 Bay Front Street San Diego, CA 92113		700 2300	1/ General ship repair. 2/ 500
Foss Shipyard 660 West Ewing Street Seattle, WA 98119		460 2585	1/ Vessel repair, alteration, and overhaul. 2/ 175
Lake Union Drydock 1515 Fairview Avenue East Seattle, WA 98102		1000 4235	1/ Ship repair and conversion. 2/ 139
Larson Boat Shop 1046 S. Seaside Ave. Terminal Island, CA 90731		400 600	1/ Ship and boat repair. 2/ 100
Pacific Fishermen, Inc. 5351 24th Avenue Seattle, WA 98107		500 1300	1/ Construction and repair of small vessels. Topside repair of large vessels. 2/ 85
Service Engineering Co. P.O. Box 7714 San Francisco, CA 94120		800 2850	1/ General ship repair and conversion. 2/ 401

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam)	Berths/Piers Usable Length in feet	Remarks
	SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Longest Total linear feet	

GREAT LAKES

(Maximum ship size that can exit the St. Lawrence Seaway locks is 730' X 78'.)

Shipbuilding Yards

Fraser Shipyards P.O. Box 997 Superior, WI 54880	825 X 82 GD 620 X 61 GD	<u>900</u> 4450	1/ Ship construction, repairs, and conversion. 2/ 120
Marinette Marine Corp. Foot of Ely Street Marinette, WI 54143	400 X 65 SW	<u>2136</u> 2136	1/ Ship construction, repair, and conversion. 2/ 300
Peterson Builders 101 Pennsylvania St. P.O. Box 650 Sturgeon Bay, WI 54235-0650	410 X 68 SW	<u>900</u> 2515	1/ Ship construction, repair, and conversion. 2/ 1,000
The Toledo Shipyard * 3135 Front Street Toledo, OH 43605	540 X 68 GD 680 X 78 GD	<u>800</u> 1610	1/ Ship construction, repair, and conversion. 2/ 25 * Leased by Merce Industries, Inc.

GREAT LAKES

**Repair Yards with
Drydock Facilities**

Bay Shipbuilding Corp. 605 North Third Ave. Sturgeon Bay, WI 54235	640 X 66 FD 1150 X 136 GD	<u>1000</u> 7095	1/ Ship construction, repairs, and conversion. 2/ 479
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GREAT LAKES

Topside Repair Yards

H. Hanson Industries 2824 Summit Street Toledo, OH 43611		<u>740</u> 1480	1/ General ship repair. 2/ 47
Nicholson Terminal & Dock Company P.O. Box 66 River Rouge, MI 48218		<u>2300</u> 3600	1/ General ship repair. 2/ 101

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 400' in Length and Over)

Name and Address	Maximum Ship Size (LOA-Beam) SW-Shipway GD-Graving Drydock FD-Floating Drydock MR-Marine Railway LL-Land Level Position SL-Syncrolift	Berths/Piers Usable Length in feet Longest Total linear feet	Remarks 1/ Type of work usually engaged in 2/ Employment - Mid-1990
<u>NON-CONUS</u>			
Shipbuilding Yards			
NONE			
<u>NON-CONUS</u>			
Repair Yards with Drydock Facilities			
Ketchikan Shipyard, Inc. P.O. Box 5380 3801 Tongass Avenue Ketchikan, AK 99907	450 X 103 FD	1000 1000	1/ General ship repair. 2/ 37
Marisco, Ltd. 607 Ala Moana Blvd. Honolulu, HI 96813	520 X 74 FD	*	1/ General ship repair. 2/ 100 * Leased from Port Commission.
Puerto Rico Drydock & Marine Terminals P.O. Box 2209 San Juan, PR 00903	632 X 97 GD	1000 3300	1/ General ship repairs. 2/ 103
<u>NON-CONUS</u>			
Topside Repair Yards			
Honolulu Shipyard, Inc. P.O. Box 30989 Honolulu, HI 96820		600 600	1/ General ship repair and overhaul. 2/ 241

