U.S. Department
of Transportation
**Maritime
Administration**

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

1991

REPORT ON SURVEY OF U.S. SHIPBUILDING AND REPAIR FACILITIES 1991

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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 1991 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 are 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 are 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 are 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 Naval Sea Systems Command, Industrial Planning Division, 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 1991 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, provided that water depth in the channel to the facility is at least 12 feet. Appendix B is a statistical abstract of data gathered from 108 companies responding to MARAD's annual survey which meet these 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 366 meter by 60 meter (1,200 ft by 198 ft) basin at BethShip's Sparrows Point Yard 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 213-meter (700 ft) basin, a complete 186-meter (610 ft) 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 the BethShip Sparrows Point Yard as an example, Table 2 lists the 366 meter by 60 meter (1,200 ft by 198 ft) 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 145 meter (475 ft) LOA at the Sparrows Point Yard, 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 17 of the major U.S. privately-owned shipbuilding facilities. Exhibits 1 through 17 are general arrangement plans of each yard's facilities. Exhibit 18 illustrates the geographical location of these 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

17 MAJOR U.S. SHIPBUILDING FACILITIES

1. Alabama Shipyard, Inc.

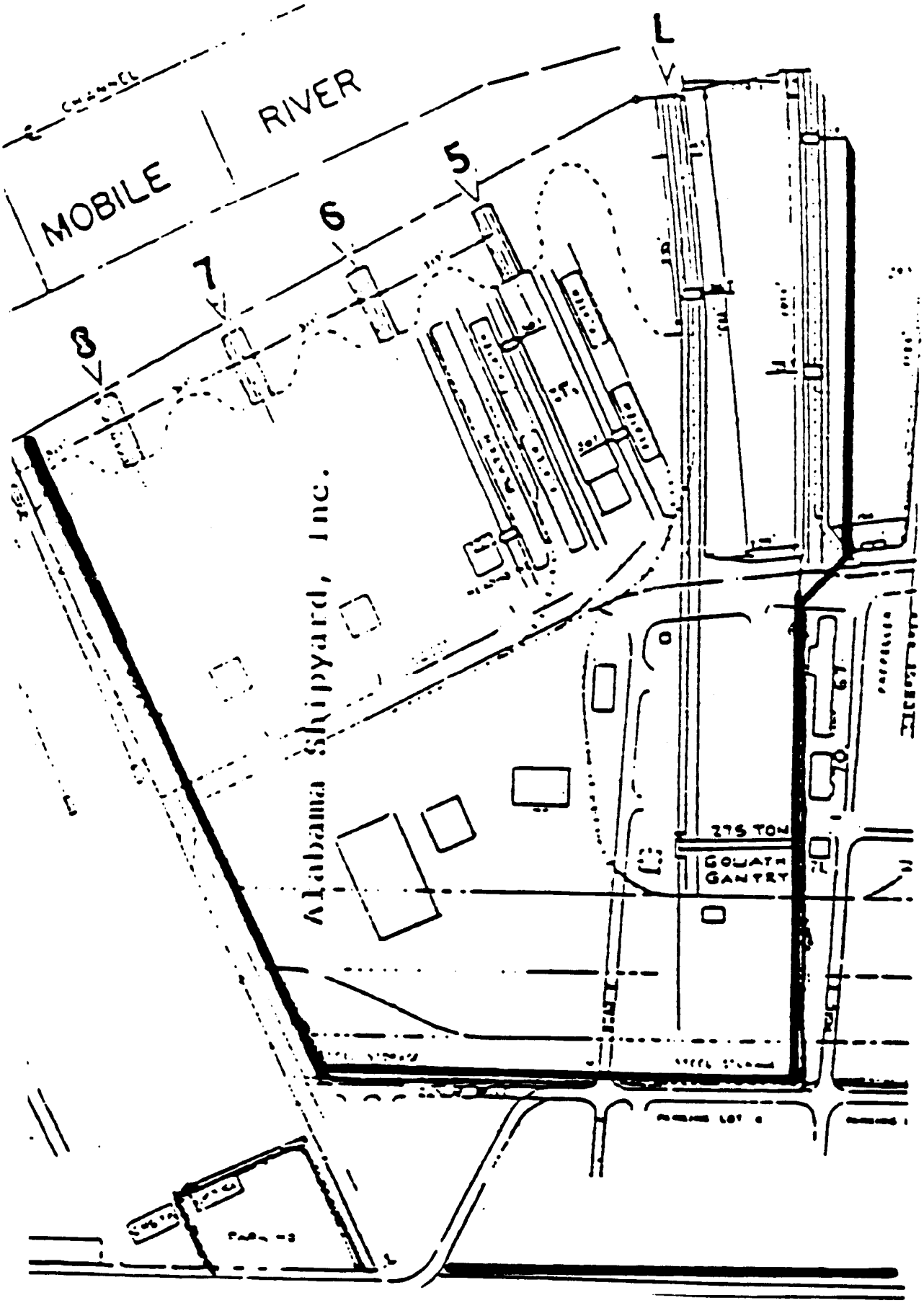
Alabama Shipyard, Inc., is a wholly-owned subsidiary of Atlantic Marine Holding Company of Jacksonville, Florida. Alabama Shipyard, Inc., (formerly ADDSCO's Alabama Maritime Corporation), is a new construction facility specializing in both marine and industrial fabrication. The shipyard is located on 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, 1991, work underway at Alabama Shipyard included construction of one floating steam boiler barge and six crane barges for the U.S. Navy.

Alabama Shipyard, Inc., is capable of constructing ships up to a maximum size of 213 meters by 27 meters (700 ft by 90 ft). The shipyard has 12,076 square meters (130,000 sq. ft) of manufacturing space, 7,432 square meters (80,000 sq. ft) of covered warehouse space, two finger piers with total usable pier space of 1,219 meters (4,000 ft), and a 250-metric ton bridge crane. The yard utilizes a 213-meter (700 ft) transfer launching system. Various other gantry cranes, as well as a plate shop and a carpenter shop, are available 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-1991, Alabama Shipyard's employment totaled 239, up from 191 a year earlier.

Exhibit 1


MOBILE
RIVER
5
6
7
8
Alabama Shipyard, Inc.
275 TON
GOLIATH
GANTRY

2. Avondale Industries, Inc. - Avondale Shipyards Division

Avondale Shipyards Division is located on the west bank of the Mississippi River approximately six kilometers (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, 1991, consisted of one oceanographic survey ship (T-AGS 45), eight fleet oilers (T-AO's) and four dock landing ships (LSD's). In addition, Avondale has contracts for the jumboization of three Navy fleet oilers of the AO-177 class.

Avondale's main yard facility totals 101 hectares (250 acres) and contains three outfitting docks equipped with supporting shops and over 1,829 meters (6,000 ft) of pier space. Avondale's upper yard shipbuilding area has two large positions to accommodate vessels of up to 311 meters (1,020 ft) in length by 53 meters (175 ft) 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 305 meters by 66 meters (1,000 ft by 216 ft), 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 366 meters by 38 meters (1,200 ft by 126 ft). 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 213 meters (700 ft) LOA, can be constructed simultaneously in the lower yard. A Panamax floating drydock is moored in this area, which can accommodate ships up to 229 meters by 34 meters (750 ft by 110 ft), and has a lifting capacity of 20,320 metric tons.

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

In mid-1991, the total employment was about 7,300.

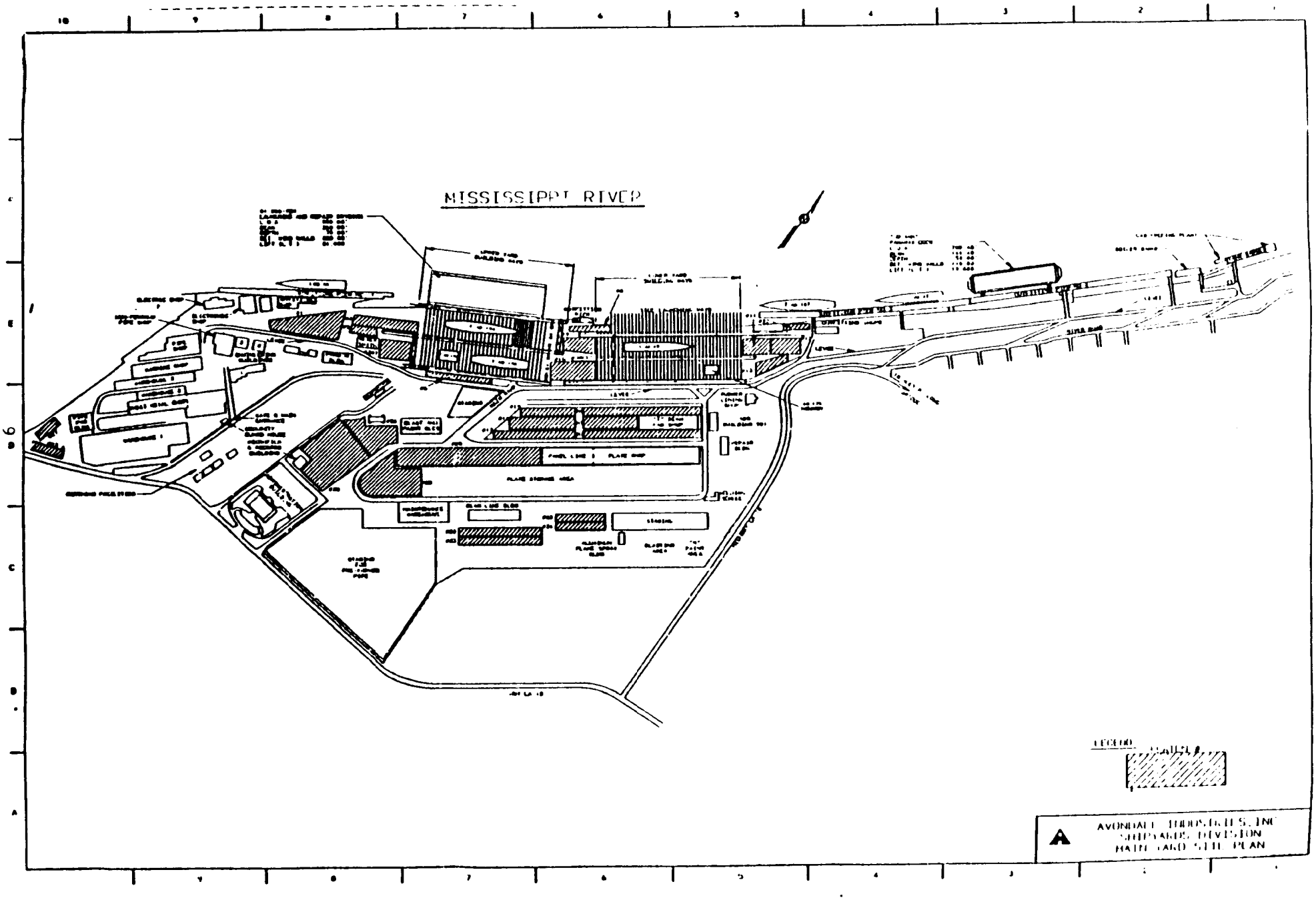

MISSISSIPPI RIVER
LEGEND
AVONDALE INDUSTRIES, INC
SHIPYARDS DIVISION
MAIN YARD SITE PLAN

Exhibit 2

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. Nine DDG's have been ordered from BIW - the last is scheduled for delivery in 1996.

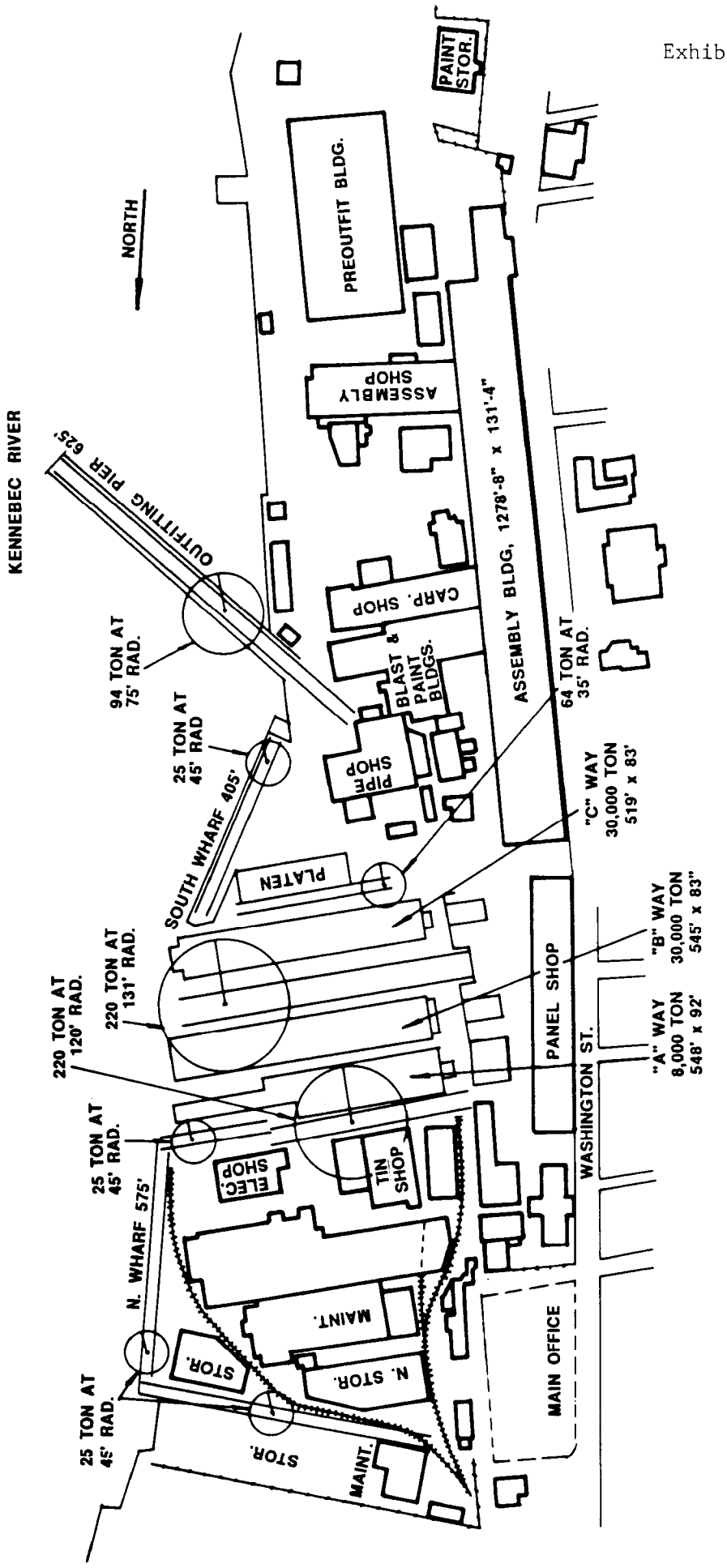
BIW's facilities include two shipways to accommodate ships of 213 meters (700 ft) in length with a maximum beam of 40 meters (130 ft), or two ships per way with a beam of 16 meters (54 ft) each; and a 220 metric ton level-luffing crane with sufficient outreach to erect units on both shipways. The pre-outfit building, opened in 1987, is 61 meters by 125 meters (200 ft by 410 ft) 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 198 meters (650 ft) in length with a beam of 27 meters (88 ft). Two wharves and a pier provide a total of 655 meters (2,150 ft).

BIW operates two support facilities in East Brunswick, located 4.8 kilometers (3 miles) from the main plant. The 13 hectare (33 acre) Hardings fabrication plant is where the initial steel fabrication takes place. The 24 hectare (60 acre) East Brunswick facility is the location of the 113,000 cubic meter consolidated warehouse which uses state of the art equipment to accomplish the transfer, handling, and storage of shipbuilding inventory. A new 11,148 square meter (120,000 sq. ft.) pipe and sheet metal fabrication facility was added in 1989.

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 257 meters by 41 meters (844 ft by 136 ft). This facility also supports new construction programs as the site where sonar dome installations and Post Shakedown Availabilities (PSA's) are performed. A 9,500 metric ton lift drydock has recently been used to overhaul four WHEC class Coast Guard ships.

As of mid-1991, the company employed a total of 10,805, compared to 11,816 a year earlier.

Exhibit 3



BATH IRON WORKS CORP.

4. BethShip Sparrows Point Yard

The BethShip 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 1981, the yard has constructed 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 increased efforts in ship conversion and repair and 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 yard is currently working on tunnel sections for the new Interstate 90 project in Boston.

The major component of this shipyard is the building basin (the second largest in the U.S.) for construction or repair of ships as large as 365 meters by 59 meters (1,196 ft by 194 ft) 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 274 meters and 91 meters (900 ft and 300 ft) in length. In the second position, the sections are 209 meters and 157 meters (685 ft and 515 ft) in length.

Complementing the large construction basin, which is served by four 181-metric ton revolving cranes, the shipyard maintains two building ways. Each way can accommodate a maximum ship size of 244 meters by 32 meters (800 ft by 106 ft). Four outfitting berths are available with a combined length of 1,210 meters (3,969 ft). The berths are served by five revolving cranes with lifting capacities up to 45 metric tons. Several mobile cranes of various capacities are also available.

BethShip Sparrows Point Yard also has a floating drydock capable of lifting 44,735 metric tons. The drydock can accommodate vessels up to 274 meters (900 ft) in length with a beam of up to 41 meters (136 ft) and a draft up to 9 meters (30 ft). The entry channel to the yard has a depth of 9 meters (30 ft).

The total labor force at the BethShip Sparrows Point Yard was 539 at mid-1991, down from 1,330 a year earlier.

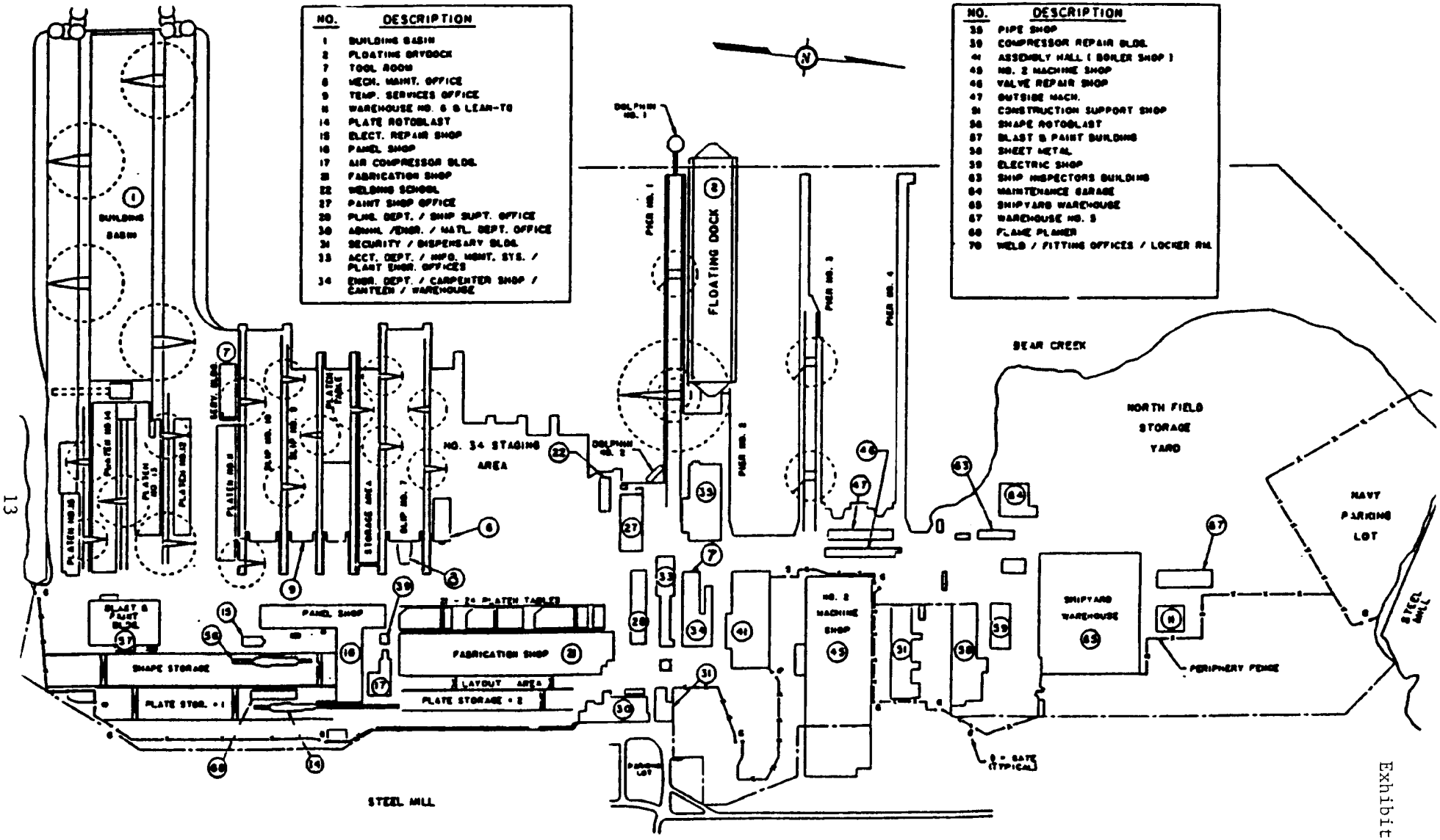


Exhibit 4

BethShip Sparrows Point Yard

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 20 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.

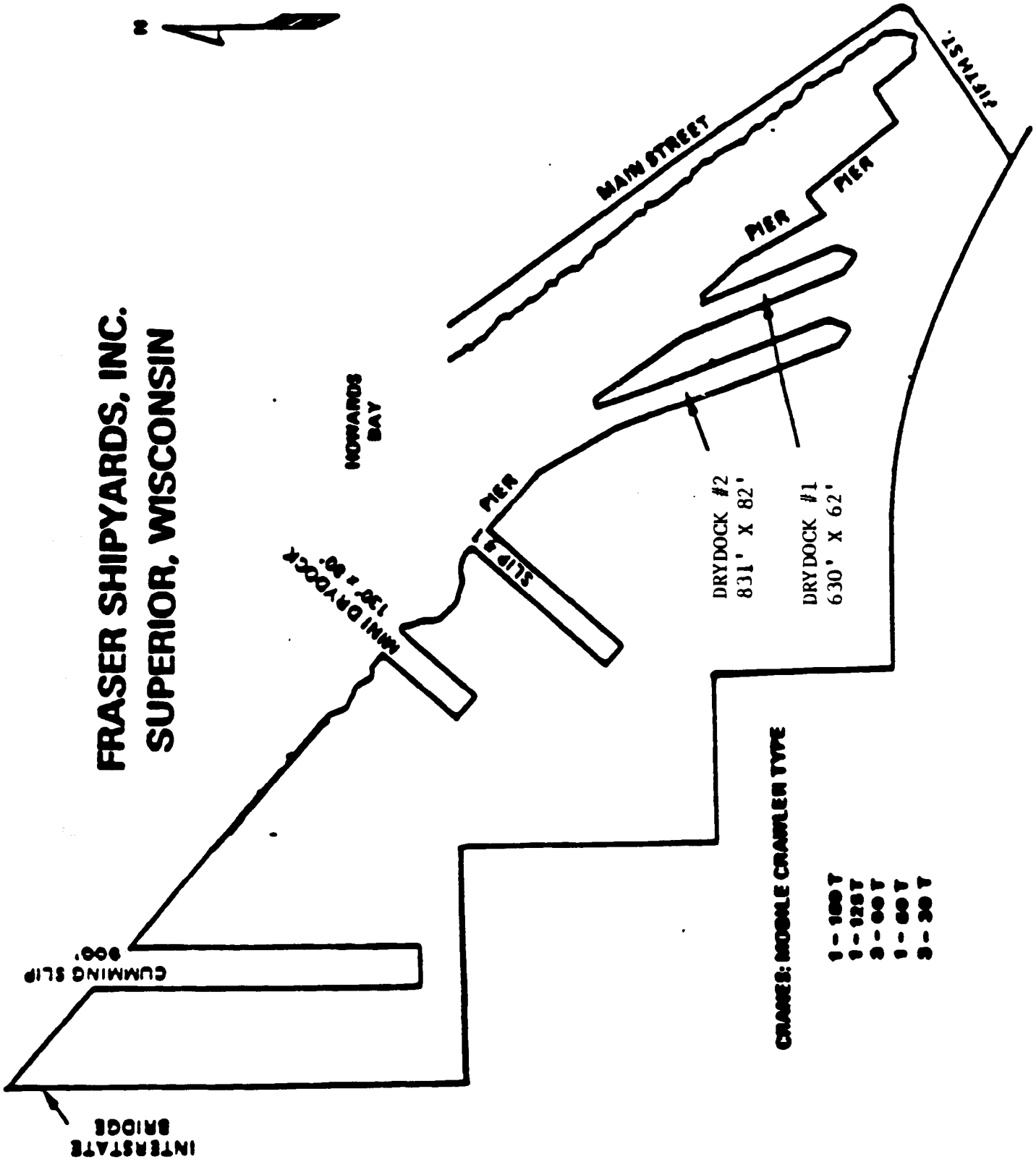
In the early 1980's, the Fraser yard instituted a major renovation of its fabrication capabilities, including a 40 percent increase in its platen table capacity and extension of its railroad trackage to increase steel unloading capabilities by 300 percent. An all-new steel cutting process with hydraulic 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 251 meters by 25 meters (825 ft by 82 ft), and the other a vessel 189 meters by 19 meters (620 ft by 61 ft). 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 1,356 meters (4,450 ft).

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-1991, employment was about 160 people.

Exhibit 5


FRASER SHIPYARDS, INC.
SUPERIOR, WISCONSIN
N
MAIN STREET
21ST ST.
PIER
PIER
PIER
HOWARDS BAY
DRYDOCK #2
831' X 82'
DRYDOCK #1
630' X 62'
SLIP 2
MAIN DRYDOCK
CUMMING SLIP
INTERSTATE BRIDGE
CRANES: MOBILE CRAWLER TYPE

6. Halter Marine, Inc., Moss Point Division.

The Halter Moss Point (HMP) facility is located on the Escatawpa River in Moss Point, Mississippi, a short distance from the Gulf of Mexico and Interstate 10. Significant features of the HMP yard include: a protected, deep-waterway location; large module fabrication and assembly platens; two launchways; lift capacity of up to 272 metric tons; full range of outfitting services; and full-service warehousing facilities.

HMP recently delivered the AGOR 23 Oceanographic Research Ship and is constructing two T-AGS 51 Class Hydrographic Survey Ships, two T-AGS 60 Class Oceanographic Survey Ships, a 73 meter (241 ft) Tow Boat/Inspection Vessel and a 91 meter (300 ft) Dustpan Dredge, both for the Army Corps of Engineers.

The Halter Moss Point facility is equipped and staffed to handle fabrication, assembly and delivery of high complexity ships up to 130 meter (425 ft) in length. The 130 meter (425 ft) by 62 meter (205 ft) building/launch ways are certified to MIL STD 1625(SH) requirements. The shipyard maintains moveable heavy-lift crane capacity of up to 272 metric tons.

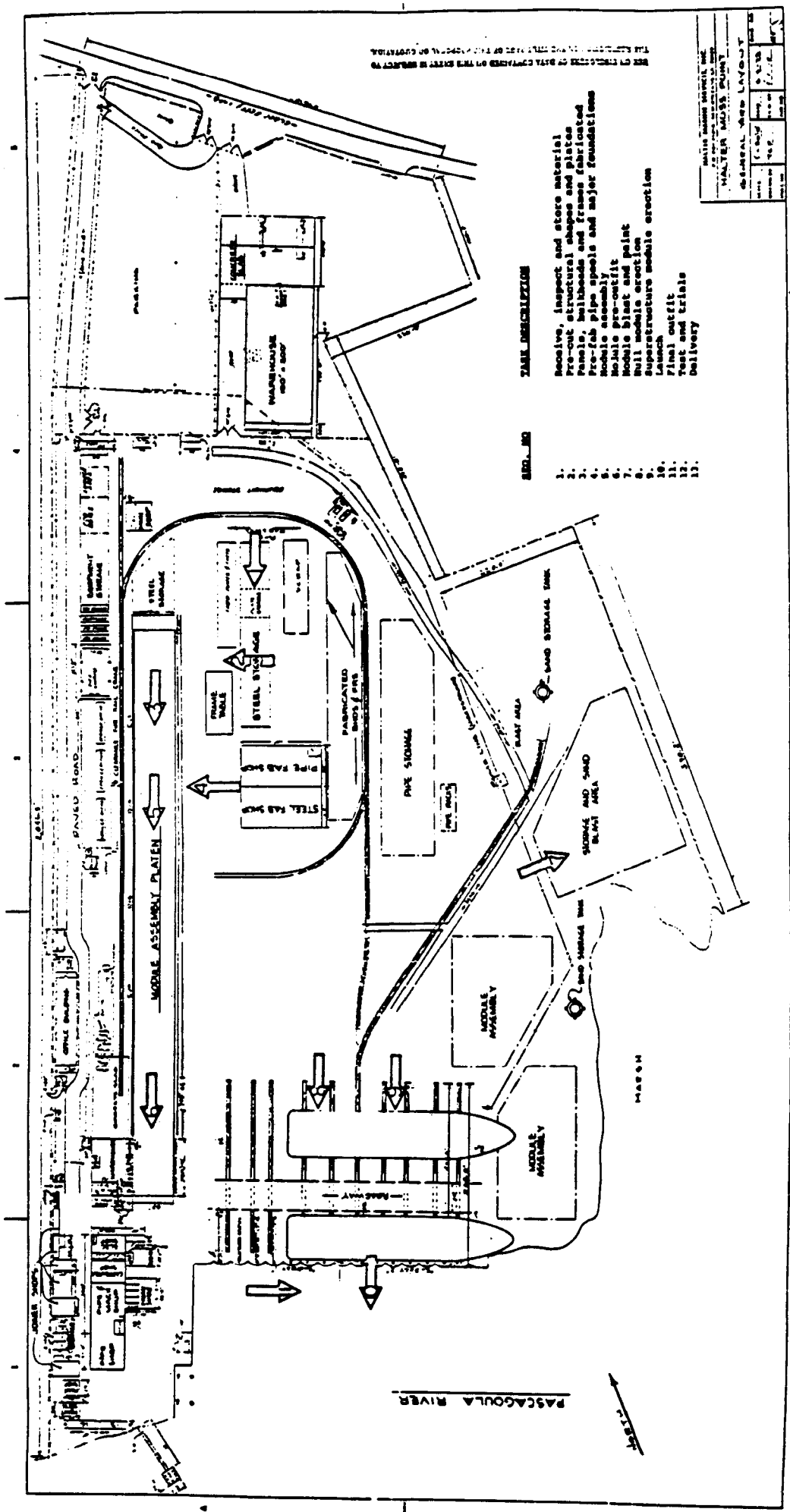
The 4-story main fabrication shop contains 929 square meters (10,000 sq ft) and is fitted with a 5 metric ton overhead crane serving its entire length plus an extension at each end, and a 9 metric ton Gantry crane. The pipe shop covers 855 square meters (9,200 sq ft). The building is serviced by four 1-ton jibs and a 5 metric ton overhead crane and contains standard outfit of pipe fabrication tools and equipment, including six pipefitter work stations. The combined carpenter shop and electric shop contains 465 square meters (5,000 sq ft). The carpenter shop contains a joiner, band saw, radial arm saw and complete outfit of portable tools and equipment. The electric shop contains portable test equipment, meters and instruments for continuity and polarity checks, insulation resistance testing, cable installation tools and equipment and battery service facilities.

The main warehouse contains 1,858 square meters (20,000 sq ft) of modern receiving and weatherproof storage space. Environmentally controlled warehouse space for the stowage and test of sensitive equipment is available on site.

The HMP yard has a steel fabrication throughput capacity of 400 tons per month. The pipe shop has the capacity to provide up to 22,859 meters (75,000 linear ft) of pipe per year. The Paint Shop has the capacity to blast and paint over 363 metric tons of steel per month.

As of mid-1991, employment at Trinity's Halter Moss Point Division was 261.

Exhibit 6


HALTER MOSS POINT
MOBILE ASSEMBLY PLATEN
PAVED ROAD
PASCAGOULA RIVER
MOBILE ASSEMBLY
MOBILE ASSEMBLY
MOBILE ASSEMBLY
PIPE STORAGE
STEEL STORAGE
FABRICATED SHOP (FMS)
FRAME WALLS
STEEL FAB SHOP
PIPE FAB SHOP
SAND STORAGE TANK
SAND STORAGE TANK
SLAB AREA
STORAGE AND SAND BLAST AREA
MARSH
WAREHOUSE
PARKING
STEEL STORAGE
SUPPORT STORAGE
GENERAL ARR LAYOUT
HALTER MOSS POINT
Receive, inspect and store material
Pre-cut structural shapes and plates
Panels, bulkheads and frames fabricated
Pre-fab pipe spools and major foundations
Module assembly
Module pre-outfit
Module blast and paint
Hull module erection
Superstructure module erection
Launch
Final outfit
Test and trials
Delivery

7. Ingalls Shipbuilding, Inc.

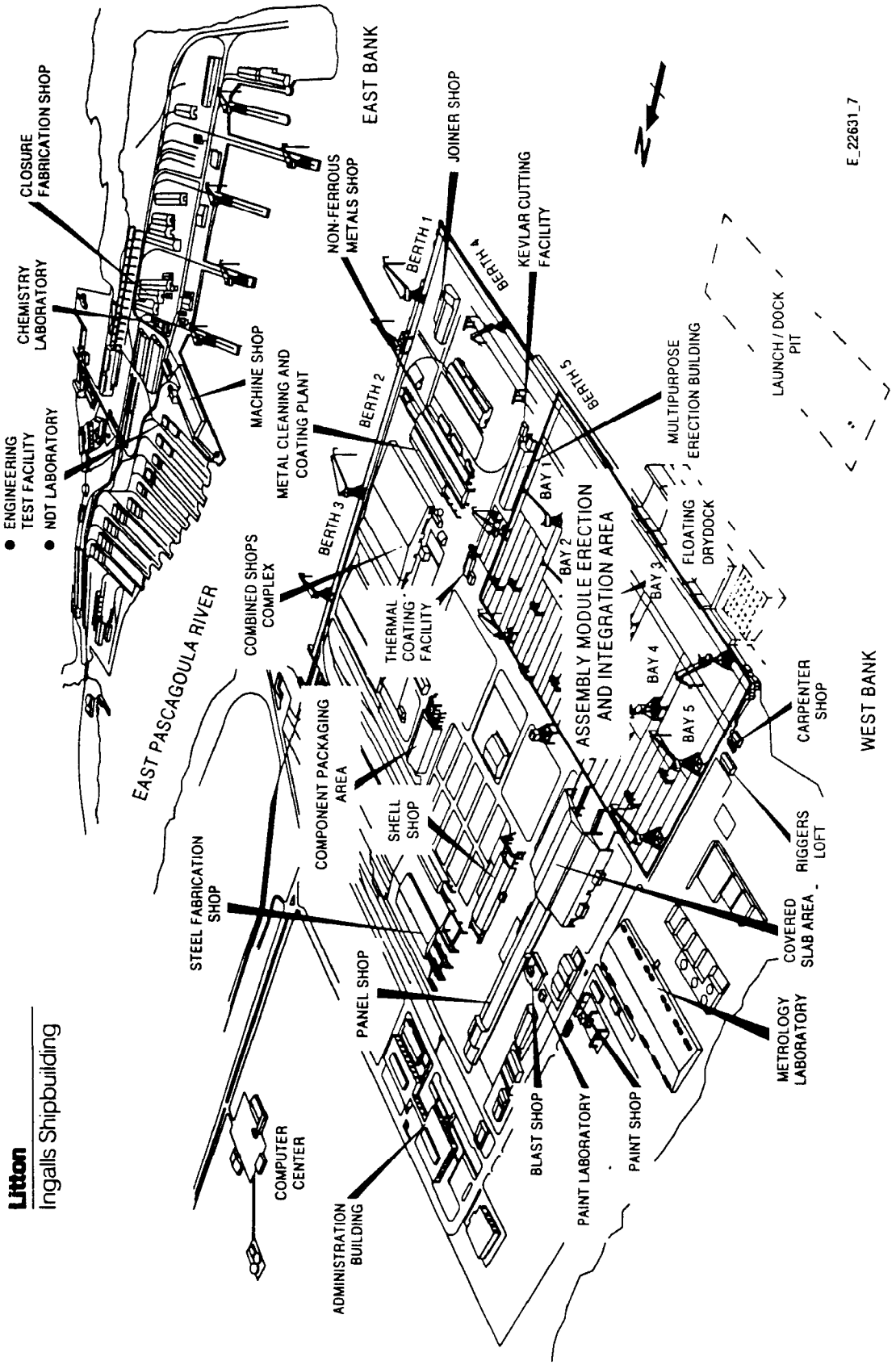
The Ingalls Shipbuilding, Inc., a division of Litton Industries, Inc., is located on the Gulf of Mexico in Pascagoula, Mississippi. Ingalls is a diversified shipbuilding facility experienced in the construction, modernization, conversion, and overhaul of Navy warships and auxiliaries. Since 1975, Ingalls has designed, built and delivered to the Navy 55 major surface combatant ships.

As of October 1, 1991, the company held orders for five 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 eight 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 SA'AR corvettes for the Government of Israel.

Ingalls 243 hectare (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 pre-outfitted, 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 259 meters by 53 meters (850 ft by 173 ft). Approximately 1,432 meters (4,700 ft) of berthing space, serviced by cranes up to 272 metric tons, are available for outfitting. In August 1988, about 16,721 square meters (180,000 sq. ft) of the shipyard's slab area were 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 914 meters (3,000 ft) 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-1991 employed a total labor force of 15,531, up from 12,987 a year earlier.


Litton
Ingalls Shipbuilding
EAST BANK
WEST BANK
EAST PASCAGOULA RIVER
ENGINEERING TEST FACILITY
NDT LABORATORY
CHEMISTRY LABORATORY
CLOSURE FABRICATION SHOP
MACHINE SHOP
METAL CLEANING AND COATING PLANT
NON-FERROUS METALS SHOP
JOINER SHOP
KEVLAR CUTTING FACILITY
BERTH 1
BERTH 2
BERTH 3
BERTH 4
BERTH 5
COMBINED SHOPS COMPLEX
THERMAL COATING FACILITY
ASSEMBLY MODULE ERECTION AND INTEGRATION AREA
BAY 1
BAY 2
BAY 3
BAY 4
BAY 5
MULTIPURPOSE ERECTION BUILDING
FLOATING DRYDOCK
LAUNCH / DOCK PIT
COMPONENT PACKAGING AREA
SHELL SHOP
CARPENTER SHOP
STEEL FABRICATION SHOP
PANEL SHOP
COVERED SLAB AREA
RIGGERS LOFT
METROLOGY LABORATORY
COMPUTER CENTER
ADMINISTRATION BUILDING
BLAST SHOP
PAINT LABORATORY
PAINT SHOP
E_22631_7

8. Marinette Marine Corporation

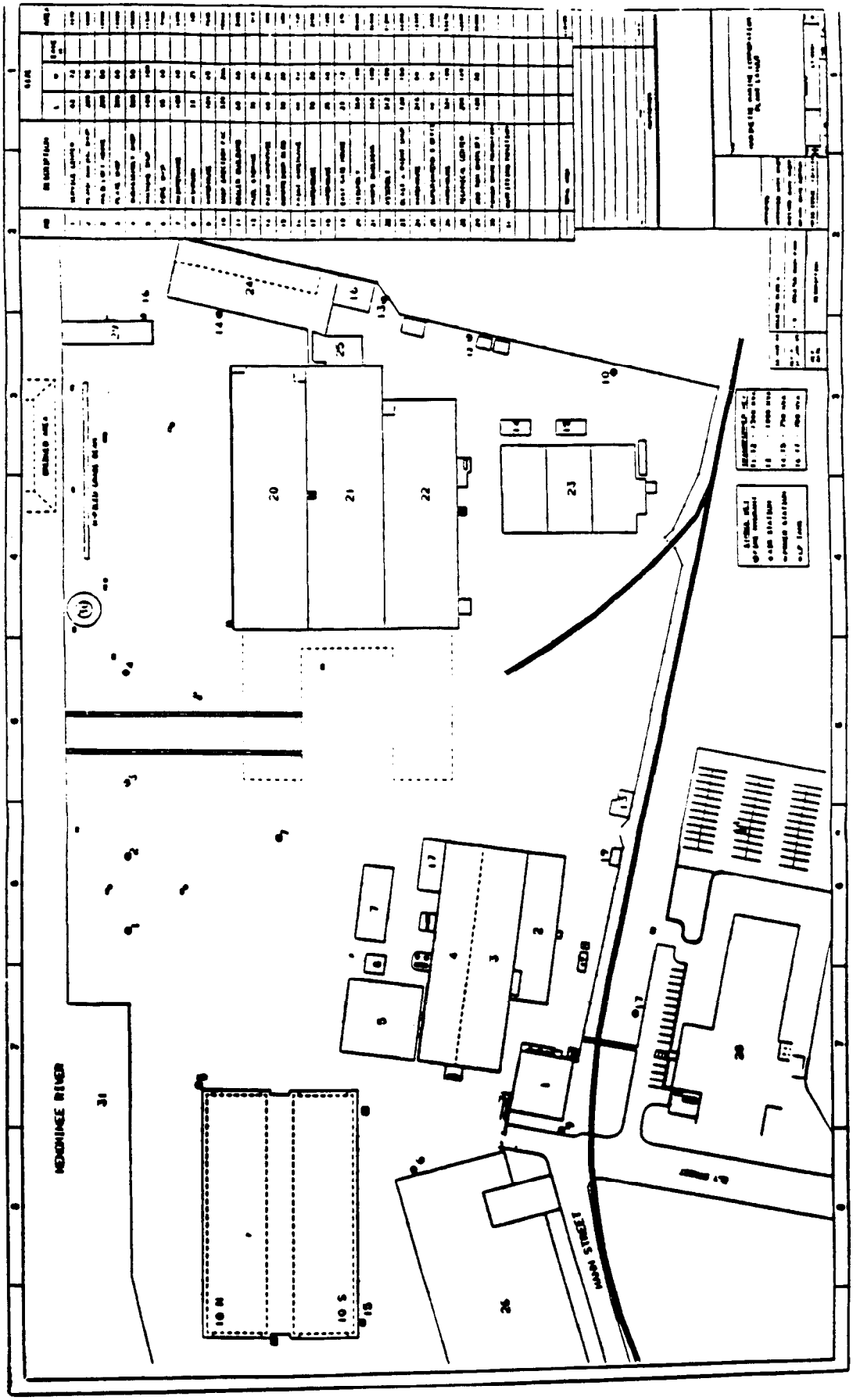
Marinette Marine Corporation is a privately-owned Great Lakes shipbuilding company founded during the early months of World War II and located in northeast Wisconsin. During the past 49 years, the yard has built nearly 1,300 vessels, including harbor tugs, research vessels, torpedo weapon retrievers, minehunters and yard patrol craft.

As of October 1, 1991, Marinette Marine was engaged in the construction of an Aids-to-Navigation (ATON) Barge for the U.S. Coast Guard. In addition, Marinette Marine held a contract for participating in the design competition for the Coast Guard's Ocean-Going Buoy Tenders (WLB). Earlier in 1991, Marinette Marine delivered two mine countermeasure vessels (MCMs) to the Navy and an additional ATON Barge to the U.S. Coast Guard.

The shipyard covers 23 hectares (57 acres) and has over 134,146 square meters (1.44 million sq. ft) of enclosed workspace permitting year-round, uninterrupted construction of vessels up to 122 meters (400 ft) in length overall with a beam of up to 20 meters (65 ft). Large fabrication shops and erection areas, a 200 metric ton shiplift, three launchways, and numerous berthing spaces along the 671 meter (2,200 ft) 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-1991 was 218, compared to 300 a year earlier.


MARINETTE MARINE CORPORATION
MENOMINEE RIVER
MAIN STREET

9. Merce Industries, Inc.

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. Merce Industries, Inc. (Toledo Shipyard), is a complete, full-service shipyard, equipped for new construction, conversion and repair, including 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 4,645 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.

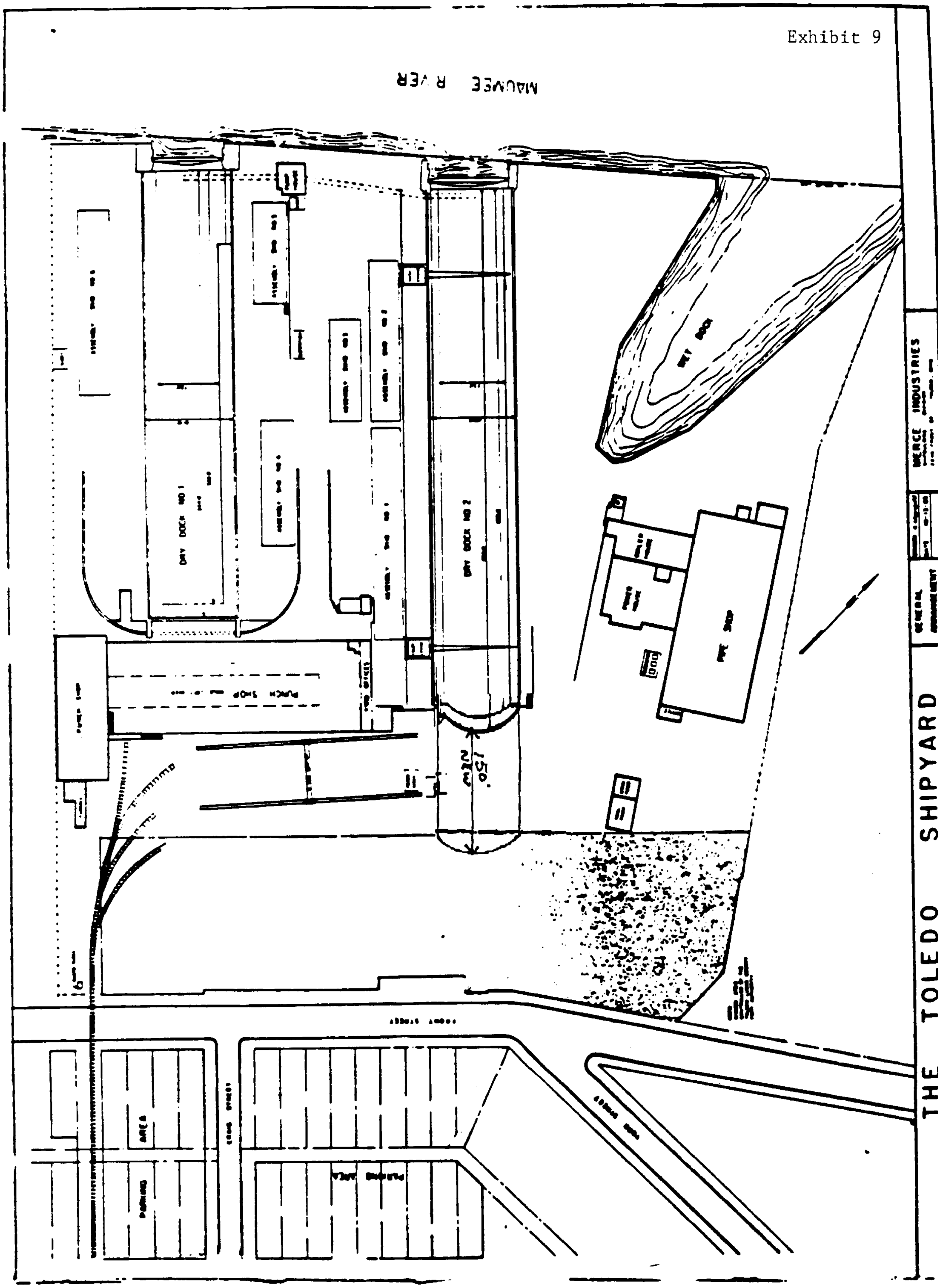
The company maintains two graving docks. One can accommodate vessels up to 207 meters by 24 meters (680 ft by 78 ft), and the other, vessels as large as 165 meters by 21 meters (540 ft by 68 ft). Usable berthing space totals about 488 meters (1,600 ft).

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-1991, employment at the shipyard totaled 60. Employment increases during the winter months as repair activity on the Great Lakes increases.

The Manitowoc Company, Inc., as of December 30, 1991, had acquired the assets of Merce Industries, Inc. In the future Merce Industries, same as Bay Shipbuilding, another component of Manitowoc, will not be involved in new construction, but will concentrate on repair and conversions in the marine industry.

Exhibit 9



MAUMEE RIVER
DRY DOCK NO 1
DRY DOCK NO 2
150' MIN
PUNCH SHOP
WET DOCK
PIPE SHOP
PARKING AREA
MERCE INDUSTRIES
GENERAL ARRANGEMENT
THE TOLEDO SHIPYARD

10. 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 now occupies 59 hectares (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, 1991, NASSCO was performing overhaul and repair work on three Navy vessels.

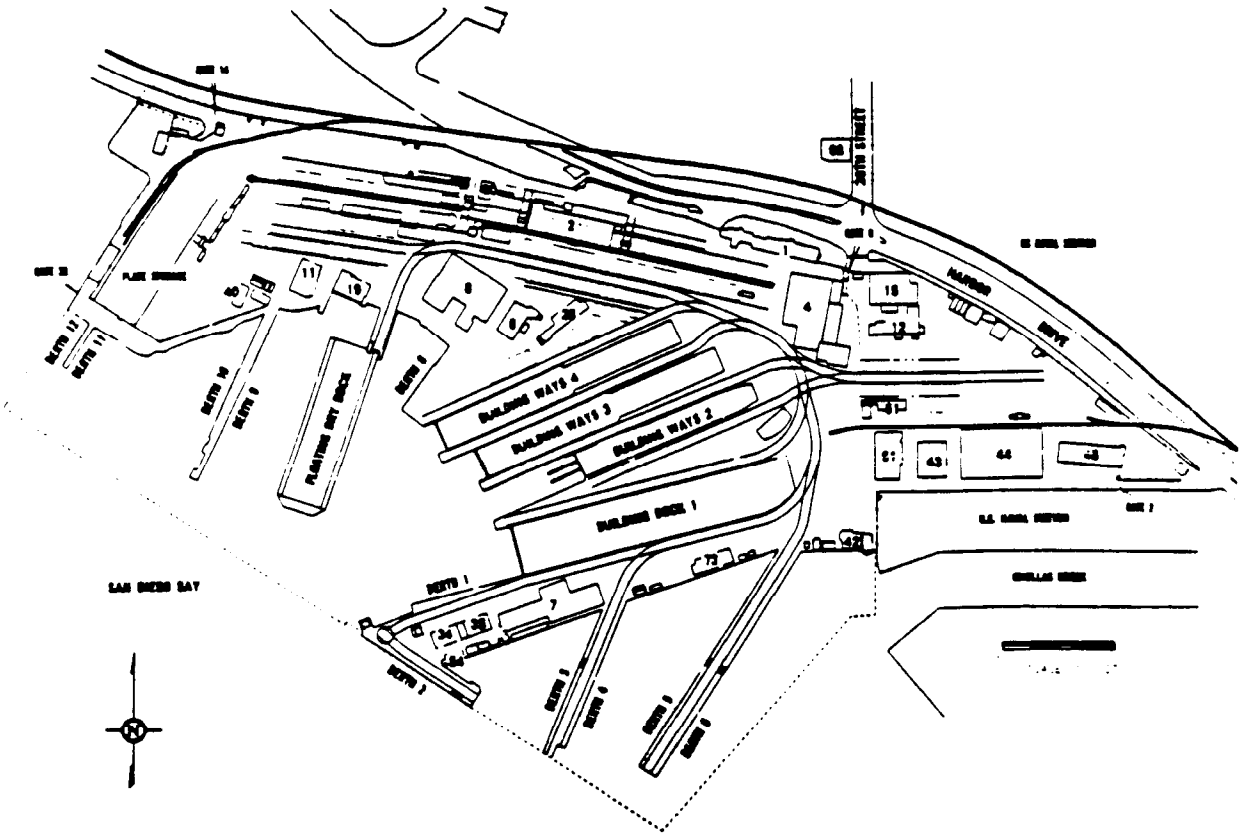
NASSCO's facilities include a building dock in which ships up to 299 meters by 52 meters (980 ft by 170 ft) can be constructed. In addition, the company operates three inclined building ways. Two of these can accommodate a maximum size ship of 274 meters by 34 meters (900 ft by 110 ft) and one a ship size of 210 meters by 27 meters (690 ft by 90 ft). 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 11 meters (35 ft) and lengths up to 305 meters (1,000 ft). 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 16 meters (52 ft) panel line, eight assembly tables with a combined area of 11,472 square meters (123,500 sq. ft), 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-1991 the total labor force was 3,931, down slightly from 3,950 in mid-1990.

NASSCO SHIPYARD LAYOUT

Exhibit 10



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
15	ADMINISTRATION ANNEX
19	TOOL ROOM
28	PLATEN OFFICE

BLDG. NO.	
34	GOVERNMENT TECHNICAL REPRESENTATIVE
35	SHIPS FORCE WORK AND STORAGE SUPPORT
40	COMBAT SYSTEMS SHOP
42	YARD CONFERENCE ROOM/SAFETY
43	WAREHOUSE
44	WAREHOUSE
45	WAREHOUSE
51	ENGINEERING
54	QUALITY ASSURANCE
60	CM-60
61	PAINT OFFICE
68	INFORMATION SYSTEMS
73	CARPENTER SHOP

DOCKS AND WAYS

BUILDING DOCK 1
1000' x 170'

BUILDING WAYS 2
675' x 96'

BUILDING WAYS 3
906' x 115'

BUILDING WAYS 4
906' x 115'

FLOATING DRY DOCK
585' x 170'
(140' CLEAR
BETWEEN WINGWALLS)

BERTHS

BERTH 1
600' x 30' Deep

BERTH 2
900' x 30' Deep

BERTH 3
560' x 30' Deep

BERTH 4
625' x 30' Deep

BERTH 5
950' x 35' Deep

BERTH 6
1000' x 35' Deep

BERTH 7
150' x 23' Deep

BERTH 8
300' x 23' Deep

BERTH 9
700' x 28' Deep

BERTH 10
630' x 28' Deep

11. 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, 1991, the yard was at work on three Nimitz class aircraft carriers and 9 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:

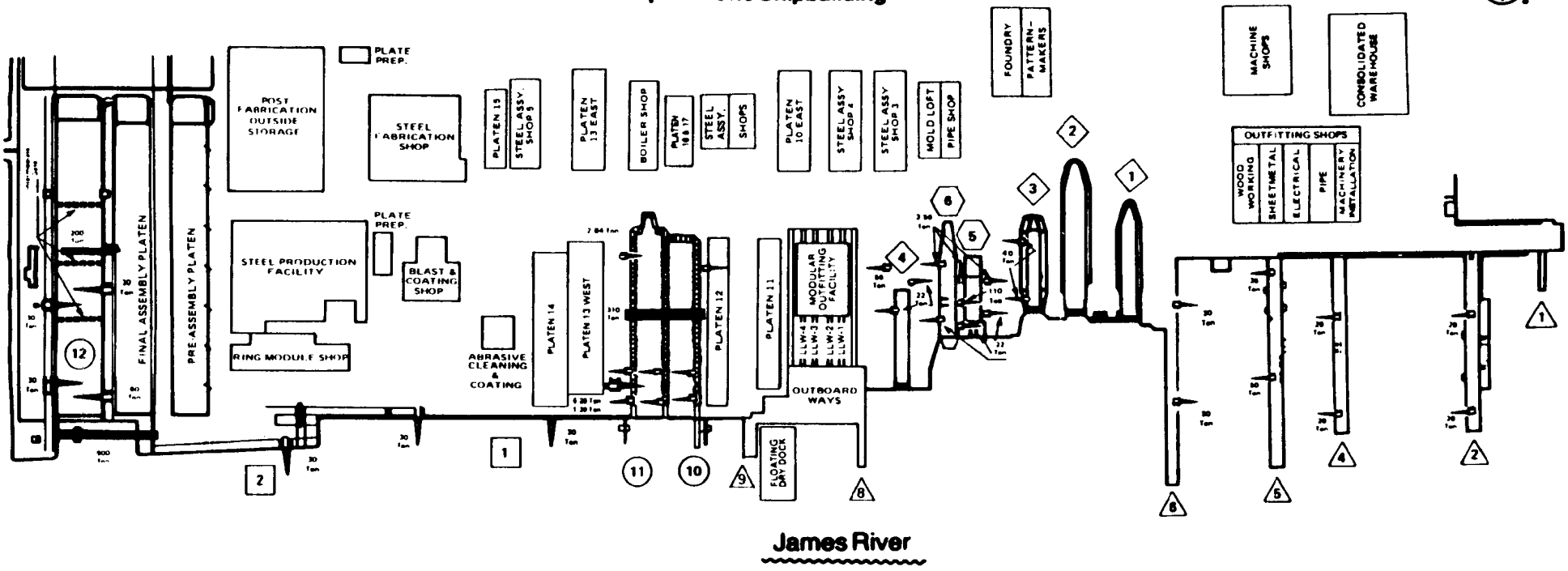
Docks and Shipways - There are eight separate docking facilities. Shipway 12, the largest building basin in the nation, is 492 meters (1,613 ft) long, 76 meters (250 ft) wide, and 10 meters (33 ft) deep. Three positions for the intermediate gate expand the multi-ship construction capability of this dock, 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 71 meters (234 ft) overall, a girder clearance of 61 meters (200 ft) and a span between rail centers of 165 meters (540 ft). 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 195 meters by 43 meters (640 ft by 140 ft), is primarily used as a part of the submarine land level facility.

Vessel Berthing - Newport News has two outfitting berths totaling 799 meters (2,620 ft) each serviced by 30 metric ton cranes. There are six piers totaling 3,353 meters (11,000 ft) 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-1991 was about 27,000, compared to 26,000 a year earlier.

Newport News Shipbuilding



James River

Dry Dock
Shipway
Pier
Inclined Shipway
Outfitting Berth

NOT TO SCALE

DOCKS

	Length	Width At Entrance Top	Width At Entrance Bottom	Water Depth (MHW) Over Sill	Water Depth (MHW) Over Blocks
Dry Dock 1	880	99	92	33	28
Dry Dock 2	982	118	106	31	29 (MAX)
Dry Dock 3	459	92	72	33	28 6
Dry Dock 4	826	76	72	33	30
Shipway 10	982	128	128	36	30
Shipway 11	1100	140	140	40	38
Shipway 12	1613	280	280	33	31
Floating Dry Dock	640	140 Between Fenders		-	37.5

INCLINED SHIPWAYS

	Length	Width
Shipway 5	447	90
Shipway 6	649	90

VESSEL BERTHING FACILITIES

	Length	Width	Water Depth (MLW) Inboard	Water Depth (MLW) Outboard
Pier 1	225	30	14	17
Pier 2	982	70	45S/37N	80S/45N
Pier 4	982	70	36S/26N	32S/38N
Pier 5	1180	80	36	38
Pier 6	940N/1334S	82	30S/32N	38S/38N
Pier 8	800	40	32	32
Pier 9	190	75	70S	32N
Outfitting Berth 1	1870		38	
Outfitting Berth 2	950		38	

Exhibit 11

12. 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.

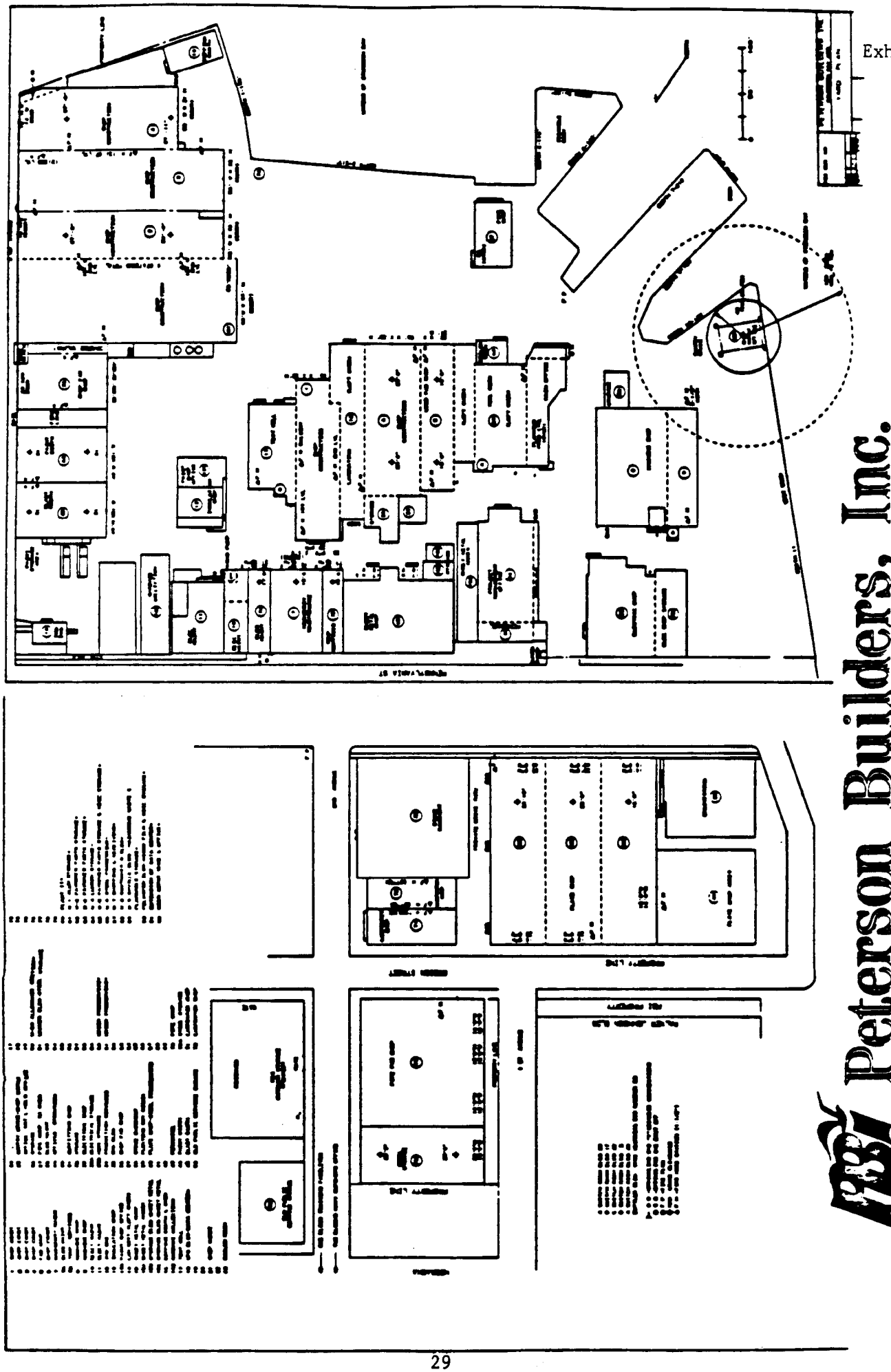
The main yard, with about 3 hectares (7 acres) of buildings, provides inside construction and production facilities; total area is about 5 hectares (13 acres). Extensive waterfront facilities provide berthing for vessels up to 274 meters (900 ft) in length. PBI operates two side launching shipways; one can accommodate a maximum ship length of 152 meters (500 ft) and the other 69 meters (225 ft). Also, inside ship construction capabilities for vessels up to 70 meters by 18 meters (230 ft by 60 ft) are available. PBI's floating drydock has the capacity to accommodate a vessel up to 110 meters by 12 meters (360 ft by 40 ft) and is Navy-certified for 1,118 metric tons.

Current construction contracts underway at PBI are for six wooden 68-meter (224 ft) Mine Countermeasure Ships (MCMs) for the U.S. Navy. 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 69-meter (255 ft) ARS Auxiliary Rescue/Salvage ships and seven wooden 33-meter (108 ft) 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 1991, Peterson Builders received contracts for the overhaul and repair of a 23-meter (77 ft) Fire Boat for the city of Detroit, a 15-meter (50 ft) EPA boat, and modifications to a 23-meter (75 ft) excursion boat. Two 55-meter (180 ft) U.S. Coast Guard Buoy Tenders were drydocked and sea chests coated.

At mid-1991, the company's average total employment was about 990, compared to 1,000 in 1990.

Exhibit 1



Peterson Builders, Inc.

13. Portland Ship Repair Yard

The Portland Ship Repair Yard is part of the Municipal Corporation of the Port of Portland. The 57-hectare (140 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 17-meter (55 ft) 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 a launching bridge to two locations. At one ship construction location, a vessel 145 meters by 30 meters (475 ft by 100 ft) can be constructed using the No. 3 drydock for launching. At the other location, a vessel up to 247 meters by 33 meters (810 ft by 108 ft) can be constructed using the No. 3 and No. 4 drydocks for launching.

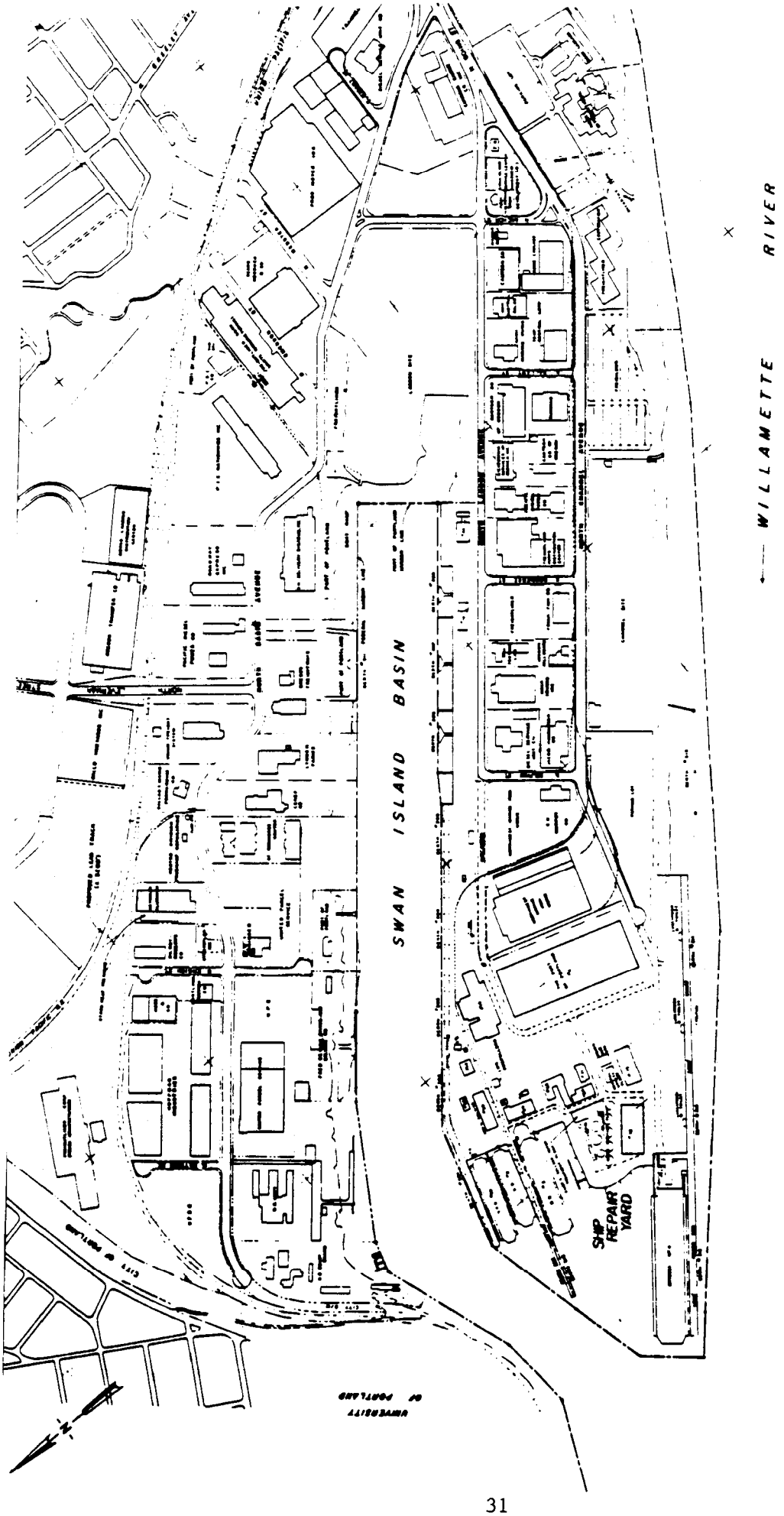
Portland Ship Repair Yard operates three drydocks. The largest two (No. 3 and No. 4) can accommodate vessels up to 247 meters by 33 meters (810 ft by 108 ft), and 351 meters by 55 meters (1,150 ft by 181 ft), respectively. A total of 3,078 meters (10,100 ft) of fully serviced pier space with 16 whirley type cranes are employed for outfitting. In 1986, a new layberth facility (Berth 315) was added which can accommodate two 335-meter (1,100-foot) VLCCs in lay-up status.

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

The Portland Ship Repair Yard is preparing to expand its modular construction capability by an additional 14 hectares (34 acres), located in the Swan Island Basin. This facility will be suitable for constructing ship modules.

As of mid-1991 the shipyard employed 3,135 persons, unchanged from mid-1990.

Exhibit 13


WILLAMETTE RIVER
SWAN ISLAND BASIN
SHIP REPAIR YARD
PORT OF PORTLAND

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 12 hectares (30 acres) of company-owned or leased property located adjacent to the Commencement Bay industrial complex.

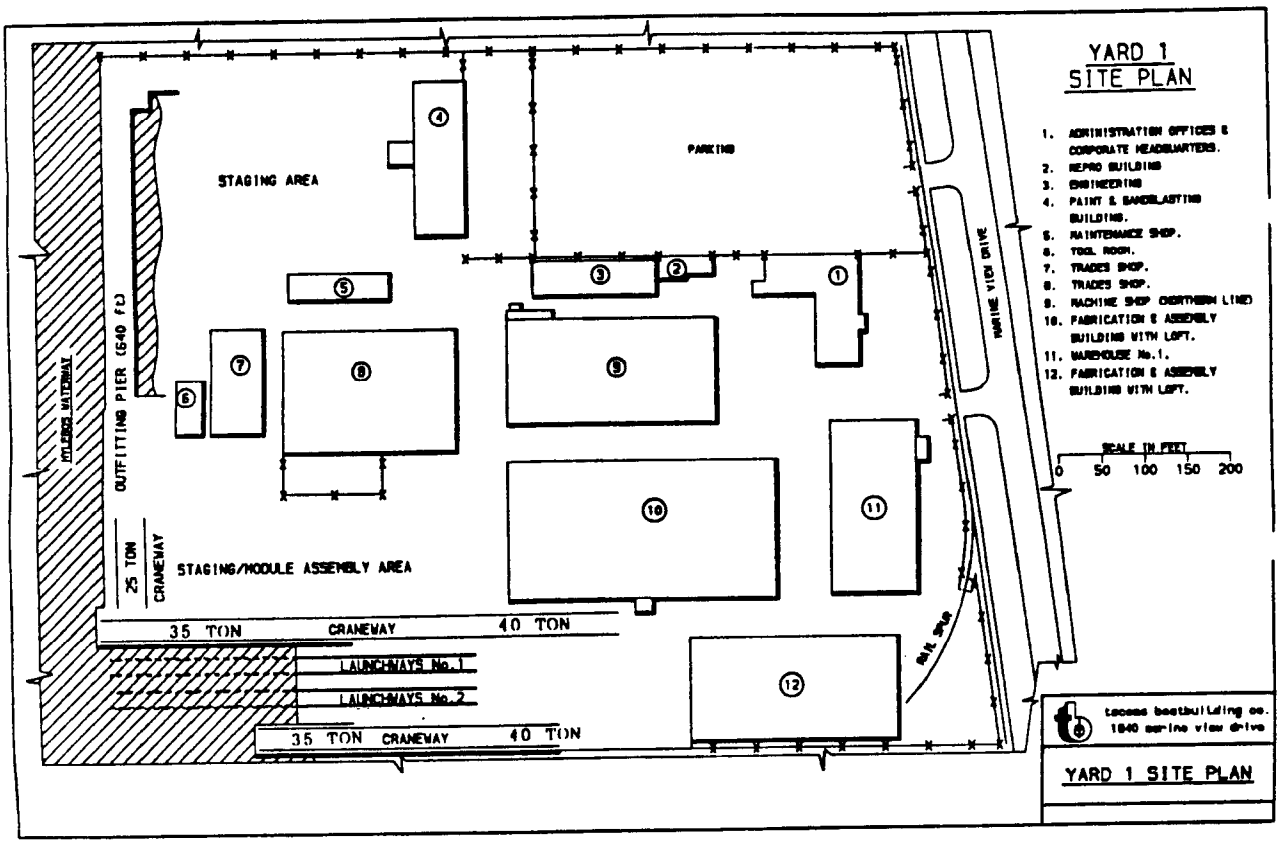
Tacoma Boat has grown continuously through the years, producing a diversified construction pattern including a variety of standard-class tuna purseiners, a semi-submersible offshore oil-drilling rig, barges and tug/supply vessels for the offshore oil industry, WYTM icebreaking tugs and WMEC cutters 82-meter (270 ft) 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).

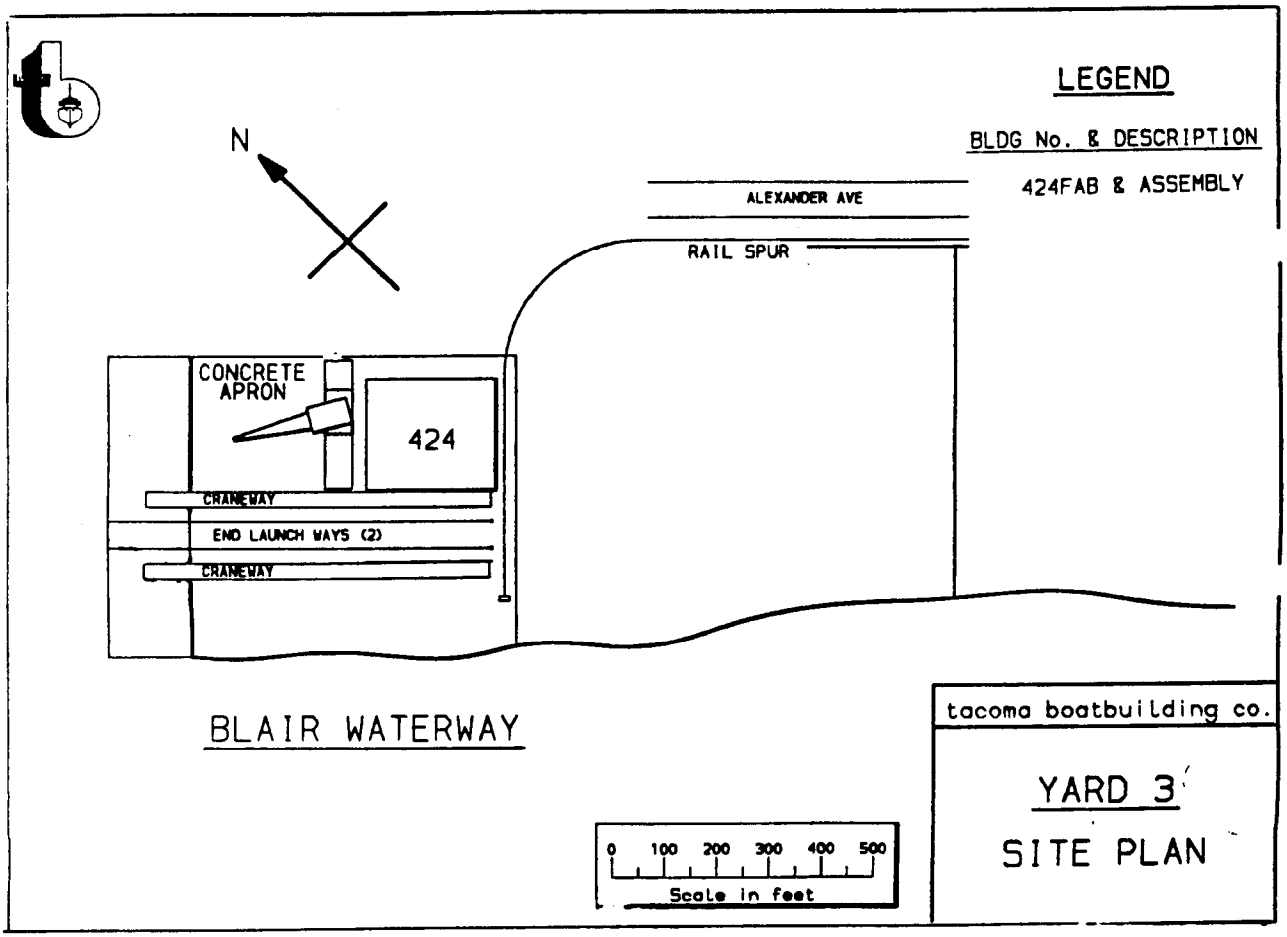
During the 1984 to mid-1991 period, Tacoma delivered 12 ocean surveillance ships (T-AGOS) to the U.S. Navy. This T-AGOS contract was a focal point for zone outfitting in which various portions or "zones" of a ship were built separately as virtually complete units and then assembled at the launchway.

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 82-meter (270 ft) 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 131 meters by 15 meters (430 ft by 50 ft). Available for outfitting and repair work are 411 meters (1,350 ft) of berthing space.

The total work force at Tacoma Boat at mid-1991 was 88, compared to 420 a year earlier.


YARD 1
SITE PLAN
1. ADMINISTRATION OFFICES & CORPORATE HEADQUARTERS.
2. REPRO BUILDING
3. ENGINEERING
4. PAINT & SANDBLASTING BUILDING.
5. MAINTENANCE SHOP.
6. TOOL ROOM.
7. TRADES SHOP.
8. TRADES SHOP.
9. MACHINE SHOP OVERHEAD LINE)
10. FABRICATION & ASSEMBLY BUILDING WITH LOFT.
11. WAREHOUSE No.1.
12. FABRICATION & ASSEMBLY BUILDING WITH LOFT.
SCALE IN FEET
0 50 100 150 200
STAGING AREA
PARKING
MARINE VIEW DRIVE
OUTFITTING PIER (640 Ft)
HYLEBOS WATERWAY
25 TON CRANEWAY
STAGING/MODULE ASSEMBLY AREA
35 TON CRANEWAY 40 TON
LAUNCHWAYS No.1
LAUNCHWAYS No.2
35 TON CRANEWAY 40 TON
RAIL SPUR
tacoma boatbuilding co.
1840 marine view drive
YARD 1 SITE PLAN


LEGEND
BLDG No. & DESCRIPTION
424FAB & ASSEMBLY
N
ALEXANDER AVE
RAIL SPUR
CONCRETE APRON
424
CRANEWAY
END LAUNCH WAYS (2)
CRANEWAY
BLAIR WATERWAY
0 100 200 300 400 500
Scale in feet
tacoma boatbuilding co.
YARD 3
SITE PLAN

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 13-meter (43 ft) Sparkman Channel in Tampa, Florida.

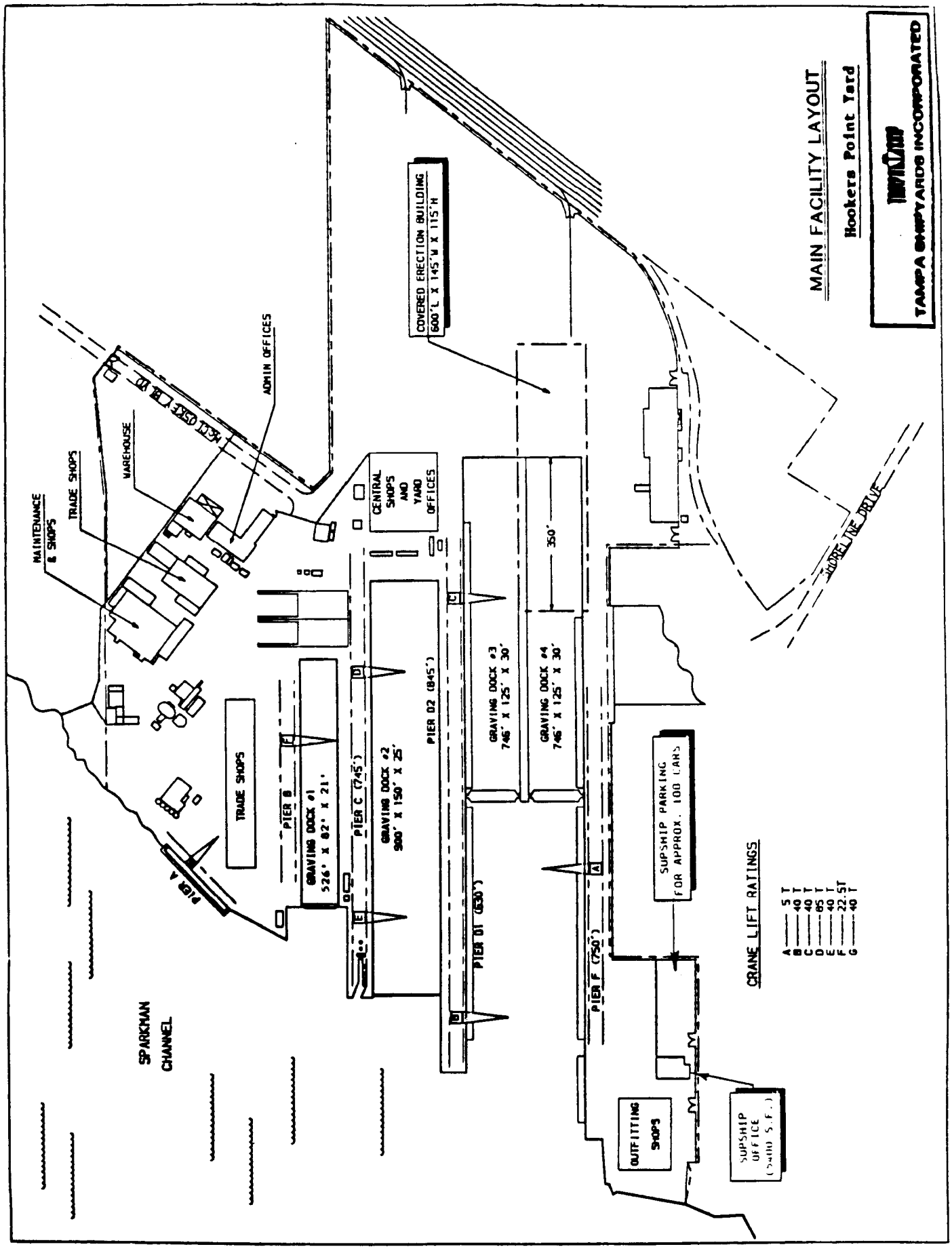
During World War II, the company built Navy auxiliary vessels and C2 cargo ships for the Maritime Commission. Since World War II, Tampa Ship has been a major Gulf Coast repair yard. During the 1980's significant projects completed by Tampa Ship included the conversion of four Moore-McCormack C4 cargo 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 183 meters by 44 meters by 35 meters (600 ft by 145 ft by 115 ft), and is serviced by three overhead bridge cranes with a combined lifting capacity of 800 metric tons. About 107 meters (350 ft) 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 273 meters by 45 meters (896 ft by 146 ft). Two of the drydocks can accommodate a vessel as large as 226 meters by 32 meters (742 ft by 106 ft).

To provide additional fabricating capability, Tampa Ship has purchased the Westinghouse heavy steel fabricating facility on Tampa's Westshore Blvd. This facility provides over 4 hectares (11 acres) of covered fabrication floor, bridge cranes up to 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 256 meters (840 ft) and 213 meters (700 ft) long.

As of mid-1991, 1,142 people were on the Tampa payroll compared to 830 in mid-1990.


MAIN FACILITY LAYOUT
Hookers Point Yard
TAMPA SHIPYARDS INCORPORATED
COVERED ERECTION BUILDING
600'L X 145'W X 115'H
ADMIN OFFICES
WAREHOUSE
MAINTENANCE & SHOPS
TRADE SHOPS
CENTRAL SHOPS AND YARD OFFICES
GRAVING DOCK #1
526' X 82' X 21'
PIER B
PIER C (745')
GRAVING DOCK #2
900' X 150' X 25'
PIER D2 (845')
GRAVING DOCK #3
745' X 125' X 30'
GRAVING DOCK #4
745' X 125' X 30'
350'
PIER D1 (630')
PIER F (750')
SUPSHIP PARKING
FOR APPROX. 100 CARS
TRADE SHOPS
SPARKMAN CHANNEL
OUTFITTING SHOPS
SUPSHIP OFFICE
CRANE LIFT RATINGS
A — 5 T
B — 40 T
C — 40 T
D — 65 T
E — 40 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 21-hectares (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.

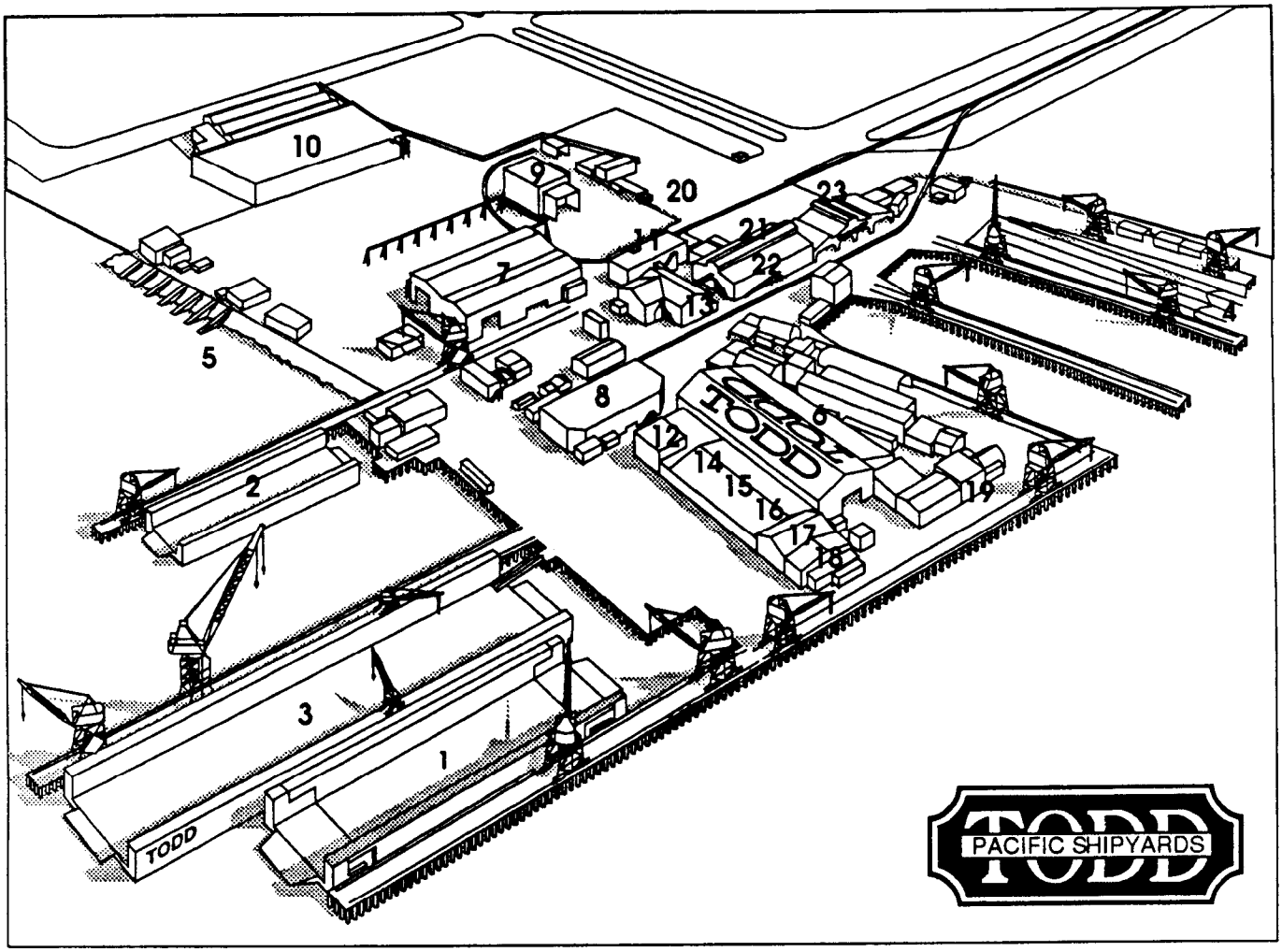
As of October 1, 1991, work in the yard included the modernization of eight Hamilton class Coast Guard cutters with the last scheduled for redelivery in April 1992. This yard has an active ship repair and overhaul operation that annually works on a large number of commercial and naval vessels.

The largest building way at Todd-Seattle can handle a ship up to 183 meters by 29 meters (600 ft by 96 ft). It can also be used as a dual launchway for simultaneous construction of two ships with beams of 15 meters (50 ft) or less. A small side-launch building way is also available. In addition to the 40,640 metric ton (40,000 long ton) drydock, there are two other floating drydocks, the larger of which can accommodate ships up to 287 meters by 41 meters (943 ft by 133 ft).

In July 1982, the company transferred a 40,640 metric ton (40,000 long ton) floating drydock from its San Francisco Division to Seattle. A new 137 metric ton traveling whirley crane on the adjacent 305-meter (1,000 ft) concrete pier serves the floating drydock and the adjacent berths. A second pier was rebuilt in concrete and lengthened to give the yard a 427 meter (1,400 ft) berth with a 12 meter (40 ft) water depth.

Two wharves and five piers provide a total of 1,834 meters (6,017 ft) 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-1991, total employment at the Seattle plant was 1,278, down from 2,552 at mid-1990.



1. Dry Dock #1
2. Dry Dock #2
3. Dry Dock #3 (Emerald Sea)
4. End Launch Ways
5. Side Launch Ways
6. Main Steel Fabrication Shop
7. Burning and Fabrication Shop
8. Machine Shop
9. Shot Blast and Paint Facility
10. Warehouse
11. Administration Building
12. Repair Superintendent's Office
13. Engineering
14. Pipe Shop
15. Main Tool Room
16. Carpenter Shop
17. Electrical Shop
18. Rigging Shop
19. Sheet Metal Shop
20. Main Entrance
21. Mold Loft
22. Stores
23. South Fabrication Shop

Piers	Construction	Size	Cap.	Crane Service		Crane Mfgr.
				Capacity	Reach	
Pier 1A	Wood	500' L	N/A	45 T	100'	Washington
Pier 1	Wood	545' L	N/A	40 T	95'	Washington
				45 T	70'	Colby
Pier 2	Wood	500' L	N/A	45 T	130'	Washington
Pier 3	Wood Pile, Concrete Deck	475' L	N/A	45 T	90'	Washington
Pier 4	Wood/Concrete	1400' L	N/A	45 T	90'	Clyde
				45 T	90'	Washington
				100 T	130'	Clyde
				45 T	100'	Colby
Pier 5	Concrete	968' L	N/A	35 T	90'	Washington
				150 T	200'	Washington
Pier 6	Wood Pile, Concrete Deck	600' L	N/A	40 T	95'	Washington
				45 T	94'	Colby

Dry Docks	Construction	Size	Cap.	Crane Service	Max Draft Over Keel Blocks
Dry Dock No. 1	Floating/Steel	528' x 27.5'	17,500 LT	Pier 4 Cranes	30'
Dry dock No. 2	Floating/Steel	352' x 21'	5,700 LT	Pier 6 Cranes	19'
Dry Dock No. 3	Floating/Steel	803' x 41'	40,000 LT	Pier 5 Cranes & (2) 25 T Wingwall Cranes	30'

17. Trinity Industries, Inc. - Beaumont Yard

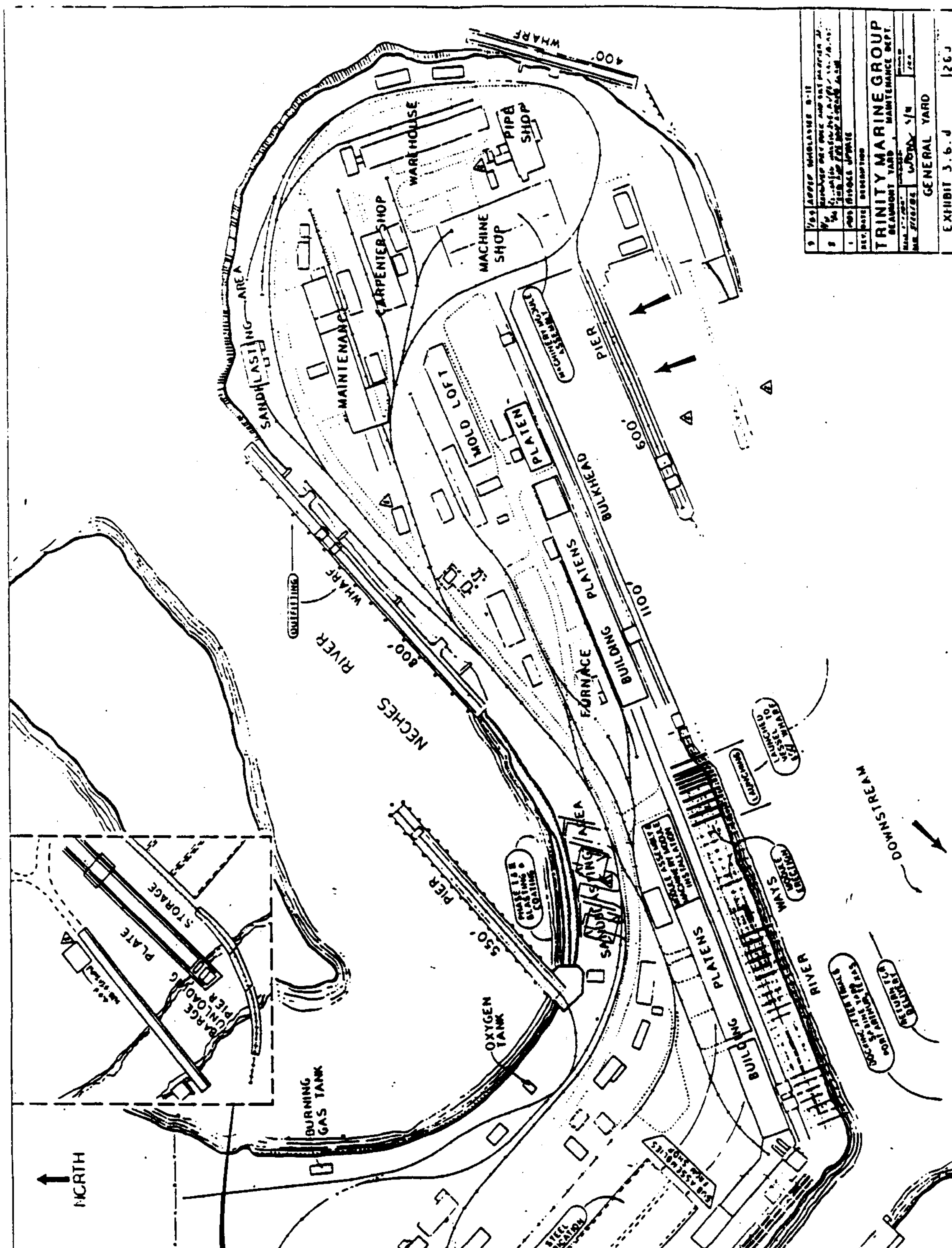
This shipyard, located on the Neches River in Beaumont, Texas, was established in 1917 by Beaumont Shipbuilding and Drydock Company, which built C1-A cargo ships and Navy minesweepers during World War II. In 1947, the yard was acquired by Bethlehem Steel Corporation, which pioneered the design and production 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 267 meters by 32 meters (875 ft by 105 ft). Also, the yard has recently acquired under lease a floating drydock (AFDM-2) from the Navy. This drydock, which can accommodate a vessel up to 198 meters (650 ft) in length with a beam of 29 meters (95 ft), is expected to be in operation by December 1991.

There are 1,402 meters (4,600 ft) of fully-serviced piers and wharves and mobile equipment for servicing ships or other vessels at pierside or anchorage. With a 508 metric ton (500 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-1991 was 95 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.


TRINITY MARINE GROUP
BEAUMONT YARD
MAINTENANCE DEPT
GENERAL YARD
EXHIBIT 3.6.d
400' WHARF
WAREHOUSE
PIPE SHOP
CARPENTER SHOP
MACHINE SHOP
MAINTENANCE
SANDBLASTING AREA
MOLD LOFT
PLATEN
600' PIER
BULKHEAD
1100'
PLATENS
BUILDING
FURNACE
800' WHARF
OUTFITTING
NECHES RIVER
550' PIER
OXYGEN TANK
BURNING GAS TANK
SANDBLASTING AREA
PLATENS
BUILDING
WAYS
RIVER
DOWNSTREAM
NORTH
PLATE STORAGE
BARGE UNLOADING PIER
MATERIAL STORAGE
SEE INSERT
ADMINISTRATION BLDG
ROLL SHOP
FABRICATING SHOP
STEEL FABRICATION
1/10 SCALE
BRAKES BAYOU WAYS
BAYOU
CITY OF BEAUMONT
PLATE STORAGE

SHIP REPAIR INDUSTRY

While over 200 privately owned firms of varying capabilities are involved in repairing ships in the United States, only 41 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 50 floating drydocks, 29 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 in length and over, provided that water depth in the channel to the shipyard itself is at least 12 feet. These facilities may also be capable of constructing a vessel less than 400 feet length overall.

Appendix B tabulates information updated through 1991 on 33 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 in length and over, provided that water depth in the channel to the facility itself is at least 12 feet. These facilities may also have drydocks and/or construction capability for vessels less than 400 feet 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 1991 on the 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 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 1991, the number of yards in the Active Shipbuilding Base remained unchanged. As of October 1991, these 16 yards employed roughly 73 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, 94 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, 8 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. Eight 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 six-year shipbuilding and conversion programs onto the estimated work force required to complete the current firm orderbook.

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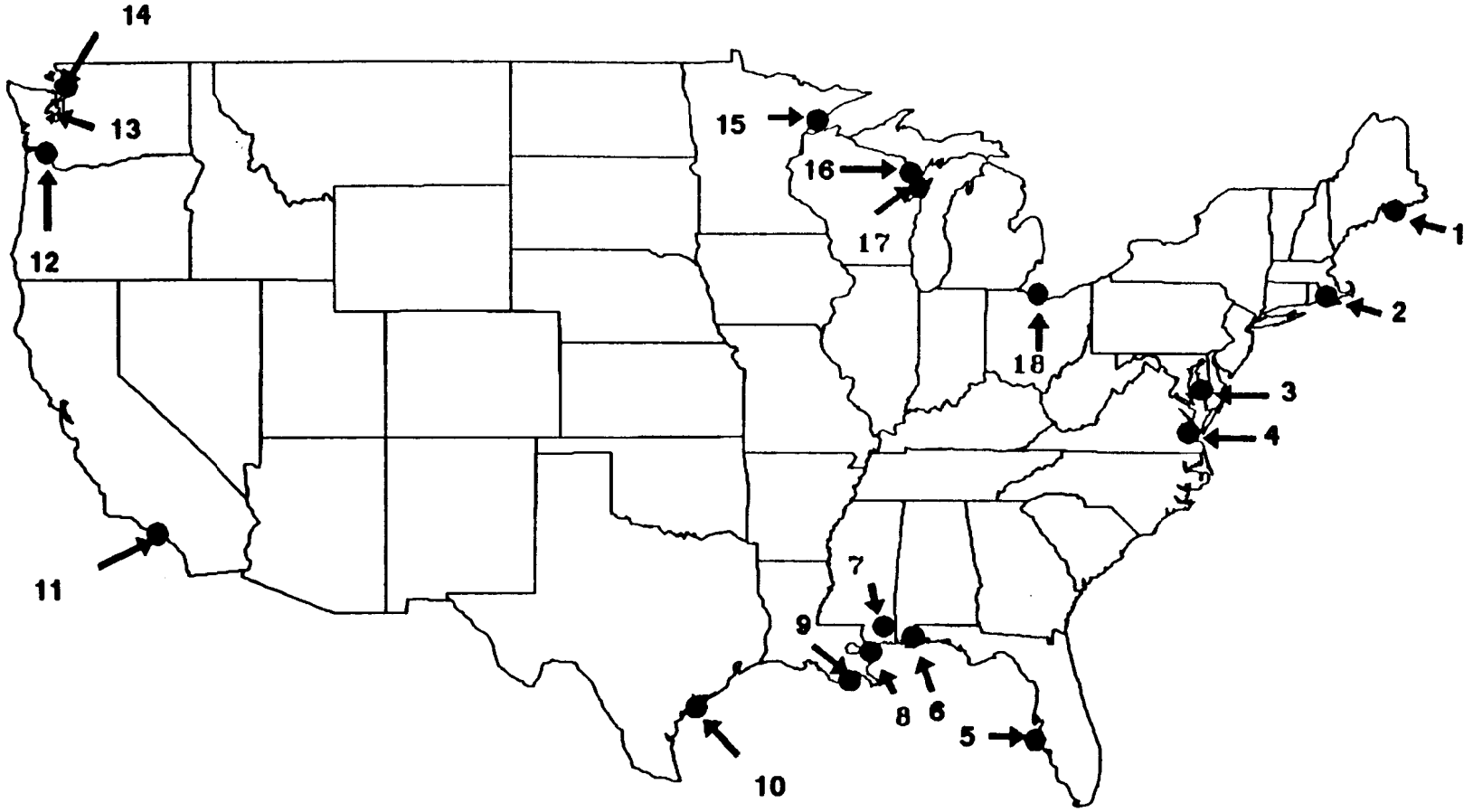
SHIPBUILDING INDUSTRY

AND ACTIVITIES - 1991

MAJOR SHIPBUILDING FACILITIES IN THE UNITED STATES



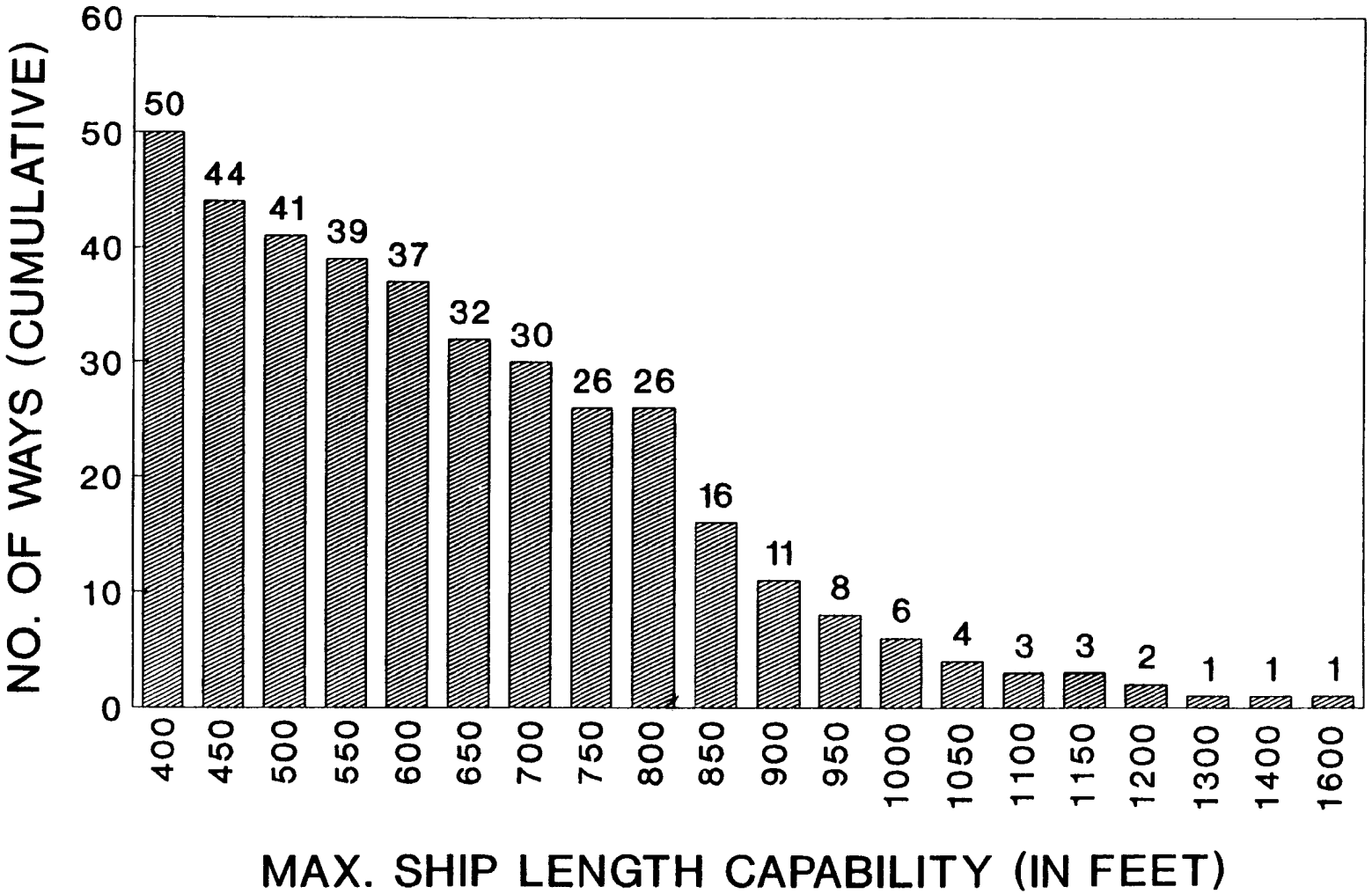
1. Bath Iron Works Corp.
2. General Dynamics – Electric Boat Div.
3. BethShip, Sparrows Point Yard
4. Newport News Shipbuilding
5. Tampa Shipyards, Inc.
6. Alabama Shipyard, Inc.
7. Halter Marine, Inc., Moss Point Div.
8. Ingalls Shipbuilding, Inc.
9. Avondale Industries, Inc.
10. Trinity Industries – Beaumont Div.
11. National Steel and Shipbuilding Co.
12. Portland Ship Repair Yard
13. Tacoma Boatbuilding Co.
14. Todd Pacific Shipyard Corp., Seattle Div.
15. Fraser Shipyards, Inc.
16. Marinette Marine Corp.
17. Peterson Builders, Inc.
18. Merce Industries, Inc. (see page 22)

1991

Exhibit 18

MAJOR U.S. SHIPBUILDING FACILITIES

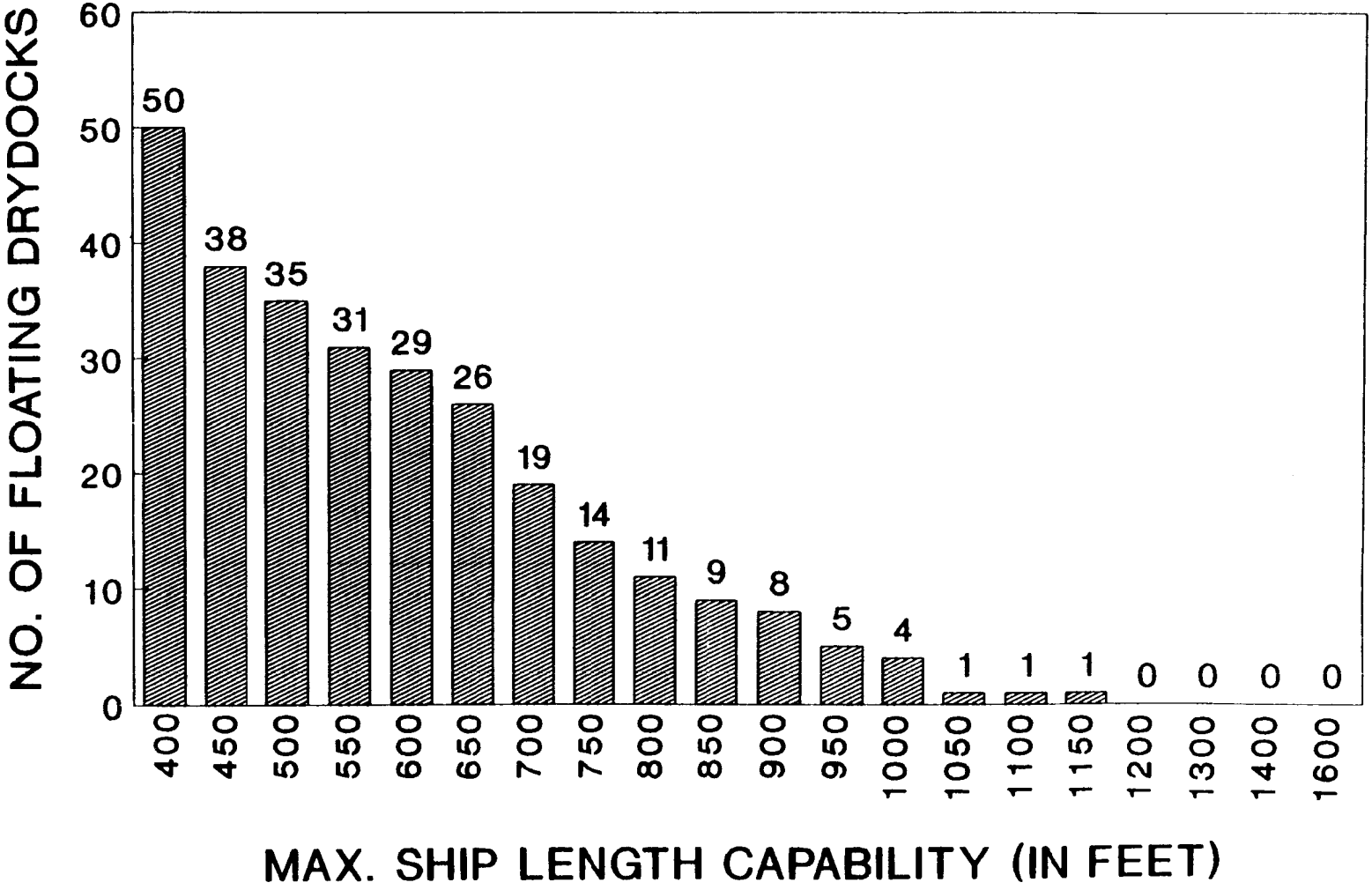
* NUMBER OF BUILDING POSITIONS BY MAXIMUM LENGTH CAPABILITY (OCTOBER 1, 1991)



• Shipways, Graving Docks and Land Level Positions

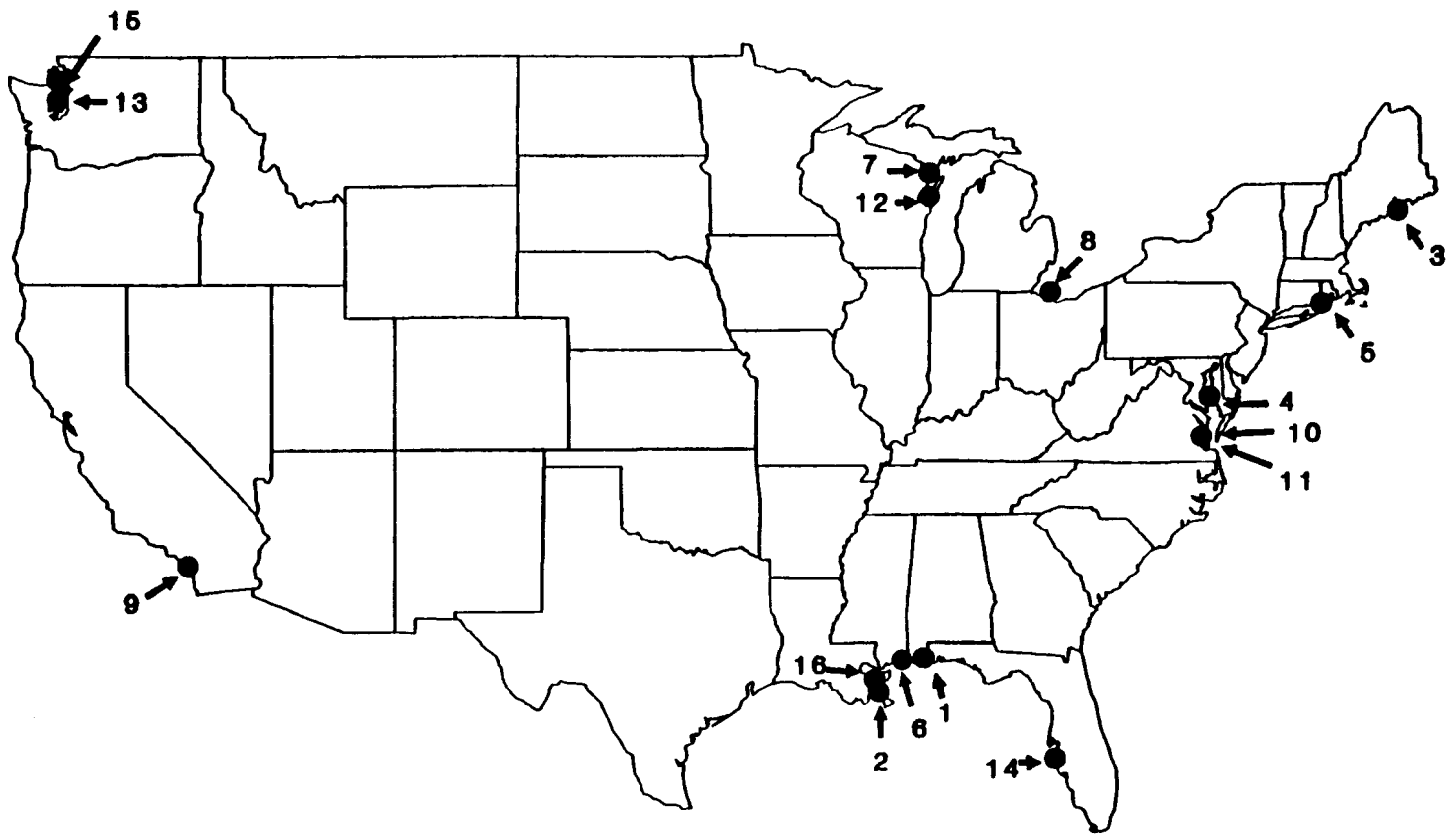
MAJOR U.S. SHIP REPAIR FACILITIES *

NUMBER OF FLOATING DRYDOCKS BY MAXIMUM LENGTH CAPABILITY (OCTOBER 1, 1991)



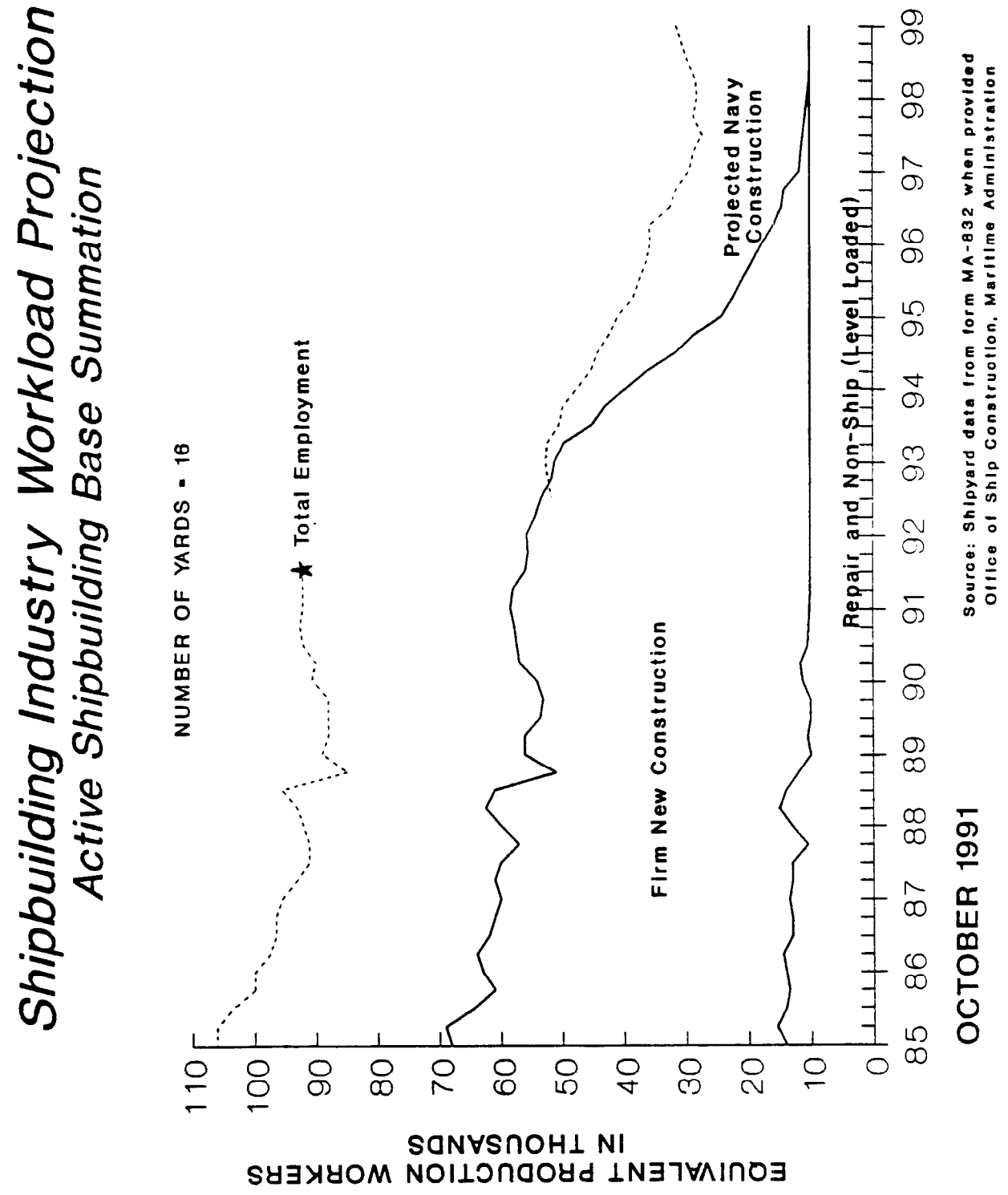
* Includes Major Shipbuilding and Repair Yards with Drydock Facilities

ACTIVE U.S. SHIPBUILDING BASE



1. Alabama Shipyard, Inc.
2. Avondale Industries, Inc.
3. Bath Iron Works Corp.
4. BethShip, Sparrows Point Yard
5. General Dynamics, Electric Boat Div.
6. Ingalls Shipbuilding, Inc.
7. Marinette Marine Corp.
8. Merce Industries, Inc.
9. National Steel and Shipbuilding Co.
10. Newport News Shipbuilding
11. Norfolk Shipbuilding and Drydock Corp.
12. Peterson Builders, Inc.
13. Tacoma Boatbuilding Co., Inc.
14. Tampa Shipyards, Inc.
15. Todd Pacific Shipyards Corp., Seattle
16. Trinity - Equitable Shipyards, New Orleans

1991


Shipbuilding Industry Workload Projection
Active Shipbuilding Base Summation
NUMBER OF YARDS = 16
Total Employment
Firm New Construction
Projected Navy Construction
Repair and Non-Ship (Level Loaded)
EQUIVALENT PRODUCTION WORKERS IN THOUSANDS
110
100
90
80
70
60
50
40
30
20
10
0
85 86 87 88 89 90 91 92 93 94 95 96 97 98 99
OCTOBER 1991
Source: Shipyard data from form MA-832 when provided
Office of Ship Construction, Maritime Administration

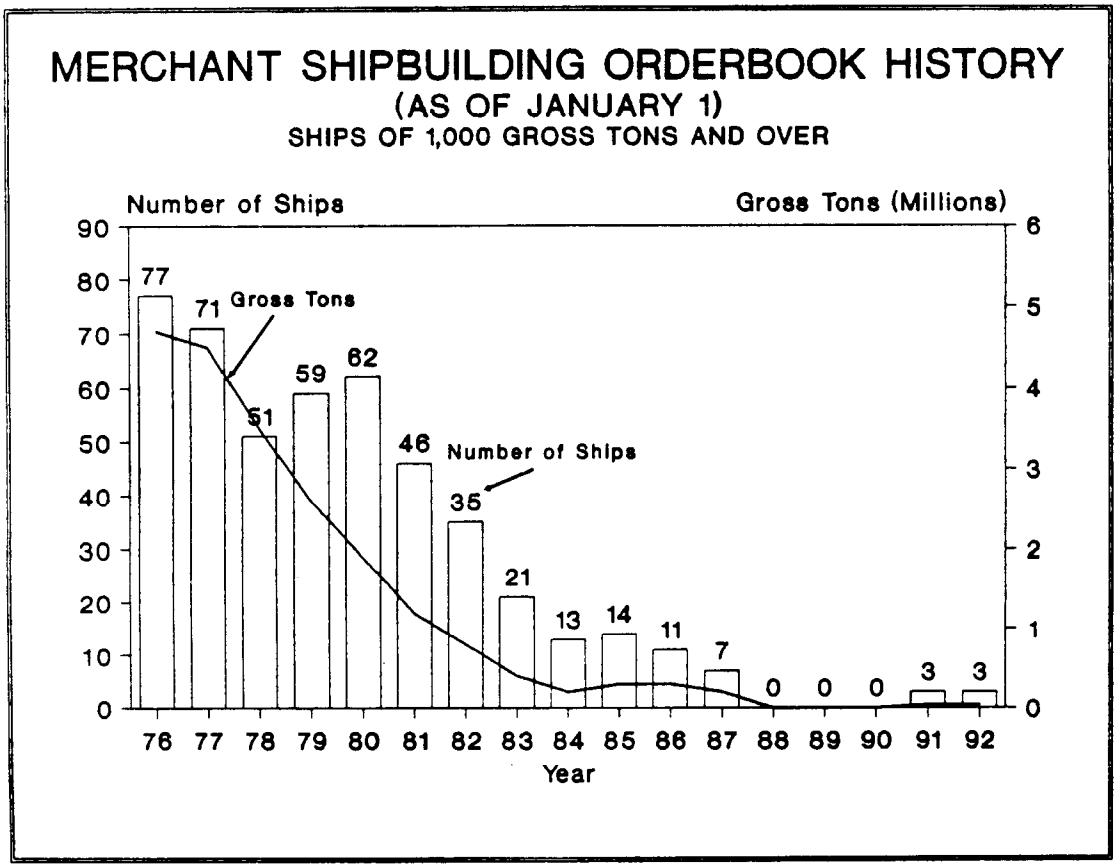
COMMERCIAL SHIP CONSTRUCTION

In 1991 no new orders for the construction of commercial ships 1,000 gross tons and larger were placed with U.S. shipyards. However, the shipbuilding orderbook remained unchanged from a year earlier. As of January 1, 1992, three vessels were still under construction. The orderbook from 1977 through 1992 is illustrated in Exhibit 23.

National Steel and Shipbuilding Company (NASSCO) of San Diego, is building a 713-foot diesel-powered containership of 32,600 gross tons (gt) designed to carry 1,650 24-foot containers. This ship was ordered by Matson Navigation Company in January 1990 and is currently scheduled for delivery in June 1992.

The two other ships in the orderbook as of January 1, 1992 are being built at Eastern Shipyards, Inc., Panama City, Florida. In October 1990, Eastern 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 January 1992 and the second ship in May 1992.

Exhibit 23

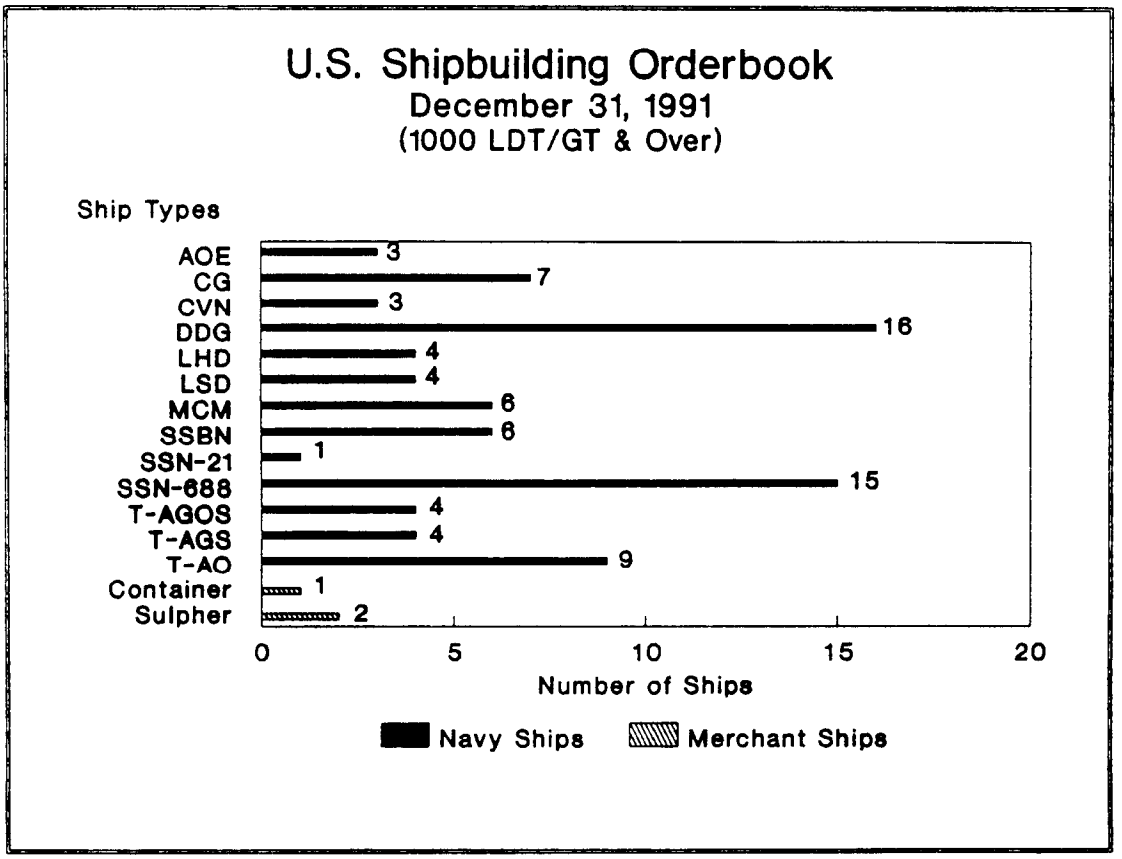


U.S SHIPBUILDING ORDERBOOK

As of December 31, 1991, 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 82 naval and 3 commercial vessels (Exhibit 24).

Eleven shipyards had contracts for the construction of naval and commercial vessels; ten shipyards had orders for the construction of naval ships. The naval shipbuilding orderbook includes 36 ships scheduled for delivery in 1994 and later. Two shipyards had orders for three commercial ships with deliveries scheduled in 1992. The orderbook is comprised of 15 different types of vessels.

Exhibit 24



NEW SHIPBUILDING ORDERS - 1991

In 1991, U.S. shipyards received orders for the construction of nine naval ships (Exhibit 25). Contracts were placed for the construction of two guided missile destroyers (DDG 65 and DDG 67) and one amphibious assault ship (LHD 5) at Ingalls Shipbuilding, Pascagoula, Mississippi; two guided missile destroyers (DDG 64 and DDG 66) at Bath Iron Works Corporation, Bath, Maine; two ocean survey ships (T-AGS 60 and T-AGS 61) at Halter Marine, Inc., Moss Point, Mississippi; one ocean surveillance ship (T-AGOS 23) at Tampa Shipyards, Inc., Tampa, Florida; and one dock landing ship (LSD 51) at Avondale Industries, Inc., New Orleans, Louisiana. The total contract value for these ships was about $2.0 billion.

Exhibit 25

NEW SHIPBUILDING ORDERS - 1991

(1,000 LDT or GT and Over)

NAVAL SHIPS

Shipyard	Symbol No.	Contract Price ($ in Mil)	LDT	Contract Award Date	Estimated Delivery Date
Bath Iron Works	DDG 64	256.5	8,300	1 / 16 / 91	9 / 14 / 95
Bath Iron Works	DDG 66	256.5	8,300	1 / 16 / 91	1 / 11 / 96
Ingalls Shipbuilding	DDG 65	254.9	8,300	1 / 16 / 91	11 / 27 / 95
Ingalls Shipbuilding	DDG 67	254.9	8,300	1 / 16 / 91	3 / 25 / 96
Halter Moss Point	T-AGS 60	49.9	3,019	1 / 30 / 91	1 / 30 / 94
Halter Moss Point	T-AGS 61	42.9	3,019	1 / 30 / 91	7 / 30 / 94
Avondale Industries	LSD 51	135.1	11,894	3 / 27 / 91	2 / 27 / 95
Tampa Shipyards	T-AGOS 23	58.6	2,486	3 / 28 / 91	5 / 28 / 94
Ingalls Shipbuilding	LHD 5	731.3	28,500	12 / 20 / 91	12 / 20 / 96
Total	9 Ships	$2,040.6	82,118		

COMMERCIAL SHIPS

No new orders in 1991

SHIP DELIVERIES - 1991

During calendar year 1991, 14 new naval vessels, 1,000 light displacement tons (LDT) and larger, were delivered by U.S. private shipyards. The vessels delivered totaled 99,606 light displacement tons (ldt) and had an initial contract value of over $2.3 billion (Exhibit 26). In 1990, U.S. shipyards delivered 13 new naval vessels valued at approximately $2.3 billion.

Ten different types of ships were delivered by eight shipyards during 1991: 1 - ballistic missile submarine (SSBN); 2 - attack submarines (SSNs); 1 - guided missile destroyer (DDG); 1 - dock landing ships (LSD); 1 - ocean surveillance ship (TAGOS); 2 - fleet oilers (T-AOs); 1 - coastal hydrographic survey ship (T-AGS); 2 - mine countermeasure ships (MCMs); 2 - guided missile cruisers (CGs); and 1 - oceanographic research ship (AGOR).

Exhibit 26

VESSELS DELIVERED IN 1991
(1,000 LDT AND OVER)

Shipyard	Symbol No.	Vessel Name	LDT	Delivery Date	Contract Price ($ Mill.)
Marinette Marine	MCM-4	CHAMPION	1,000	01/07/91	42.0
Avondale Industries	T-AO 194	JOHN ERICSSON	15,000	03/18/91	97.0
Bath Iron Works	CG 64	GETTYSBURG	8,910	04/05/91	193.3
Ingalls Shipbuilding	CG 66	HUE CITY	8,910	06/28/91	184.0
Bath Iron Works	DDG 51	ARLEIGH BURKE	8,300	04/29/91	317.6
Avondale Industries	LSD 47	RUSHMORE	11,100	04/26/91	148.7
GD - Electric Boat	SSBN 737	KENTUCKY	12,500	06/27/91	616.4
GD - Electric Boat	SSN 757	ALEXANDRIA	6,000	06/13/91	283.0
Newport News	SSN 758	ASHEVILLE	6,000	08/29/91	259.8
Halter - Moss Pt.	AGOR 23	THOMAS G THOMPSON	2,100	07/15/91	20.9
McDermott	T-AGOS 19	VICTORIOUS	2,486	09/03/91	24.1
Marinette Marine	MCM 7	PATRIOT	1,000	08/30/91	51.7
Halter - Moss Pt.	T-AGS 51	JOHN MCDONNEL	1,300	10/25/91	14.0
Avondale	T-AO 196	KANAWHA	15,000	12/06/91	95.0
Total			99,606		$2,347.5

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 54 new ships and the conversion of 31 existing vessels. The initial contract value for these vessels totaled almost $5.4 billion.

During 1991, two T-ship contracts were placed with U.S. shipyards. Halter Marine, Inc., Moss Point, Mississippi received an order with an initial contract value of $92.8 million to build two ocean survey ships (T-AGS 60 and T-AGS 61). Tampa Shipyards, Inc., Tampa, Florida won a contract to build T-AGOS 23, the lead ship of the ocean surveillance ship (SURTASS) design.

Deliveries included a SWATH class ocean surveillance ship (T-AGOS 19) by McDermott Shipyards, Morgan City, Louisiana; two fleet oilers (T-AO 194 and T-AO 196) by Avondale Industries, New Orleans, Louisiana; and a coastal hydrographic survey ship (T-AGS 51) by Halter Marine, Inc., Moss Point, Mississippi.

As of January 1, 1992, 17 new ships were either under construction or on order at four shipyards (Exhibit 27). The value of this orderbook is approximately $1.3 billion.

Exhibit 27

T-SHIPS ON ORDER OR UNDER CONSTRUCTION
(as of December 31, 1991)

Shipyard	Navy No.	Vessel Name	Estimated Delivery Date	Contract Price ($ in Mill.)
Avondale	T-AO 198	BIG HORN	4 / 7 / 92	109.60
Avondale	T-AO 200	GUADALUPE	8 / 31 / 92	97.60
Avondale	T-AGS 45	WATERS	3 / 19 / 93	104.40
Avondale	T-AO 199	TIPPECANOE	3 / 26 / 93	106.30
Avondale	T-AO 201	PATUXENT	1 / 31 / 94	106.30
Avondale	T-AO 202	YUKON	8 / 31 / 93	97.50
Avondale	T-AO 204	RAPPAHANNOCK	6 / 30 / 94	97.50
Avondale	T-AO 203	LARAMIE	11 / 30 / 94	106.30
Halter	T-AGS 52	LITTLEHALES	1 / 10 / 92	11.10
Halter	T-AGS 60	PATHFINDER	1 / 30 / 94	49.90
Halter	T-AGS 61	SUMNER	7 / 30 / 94	42.90
McDermott	T-AGOS 20	ABLE	3 / 24 / 92	19.80
McDermott	T-AGOS 21	EFFECTIVE	8 / 28 / 92	19.80
McDermott	T-AGOS 22	LOYAL	2 / 19 / 93	19.80
Tampa	T-AO 191	BENJAMIN ISHERWOOD	5 / 31 / 92	111.25
Tampa	T-AO 192	HENRY ECKFORD	12 / 15 / 92	111.25
Tampa	T-AGOS 23	IMPECCABLE	5 / 28 / 94	58.60
	17 ships			$1,269.90

PROJECTED NAVY SHIPBUILDING PLAN

The U.S. Navy shipbuilding plan for fiscal years 1992 - 1997 includes the construction of 58 new ships, as illustrated in Exhibit 28. More than $50 billion is proposed for this plan. Shipyard contract value, however, corresponds to only about a third of this amount. The remainder is attributed to such items as Government-furnished equipment placed aboard the vessels and to other Government program costs.

The Navy's proposed FY 1992 - 1997 shipbuilding program represents a significant reduction in the amount of new shipbuilding work available to the nation's industrial base when compared with previous Navy programs. At an average of less than 10 ships per year, this program represents almost a 50 percent reduction in the quantity of ships to be procured compared with the 19 ships per year average for Navy programs during the 1980s.

The Navy's plan includes the construction of 1 nuclear aircraft carrier (CVN) , 7 nuclear attack submarines (SSN 21) and 22 guided missile destroyers (DDG-51). These three shipbuilding programs would probably consume approximately 80 percent of the available funding.

Exhibit 28

NAVY SHIPBUILDING PLAN
Fiscal Years 1992 - 1997

Type of Ship	1992	1993	1994	1995	1996	1997	TOTAL
CVN				1			1
SSN-21	1	1	1	1	2	1	7
DDG-51	5	4	3	3	4	3	22
LSD-41	1	1					2
LX				1		1	2
MHC	2	2	1				5
MHC(V) OR MCM				1		2	3
T-AGOS		1	1	2			4
T-AGS (OCEAN)	2	2	2	1			7
ARS			1		2		3
AOE	1						1
AR					1		1
LCAC	(12)	—	—	—	—	—	—
Total	12	11	9	10	9	7	58

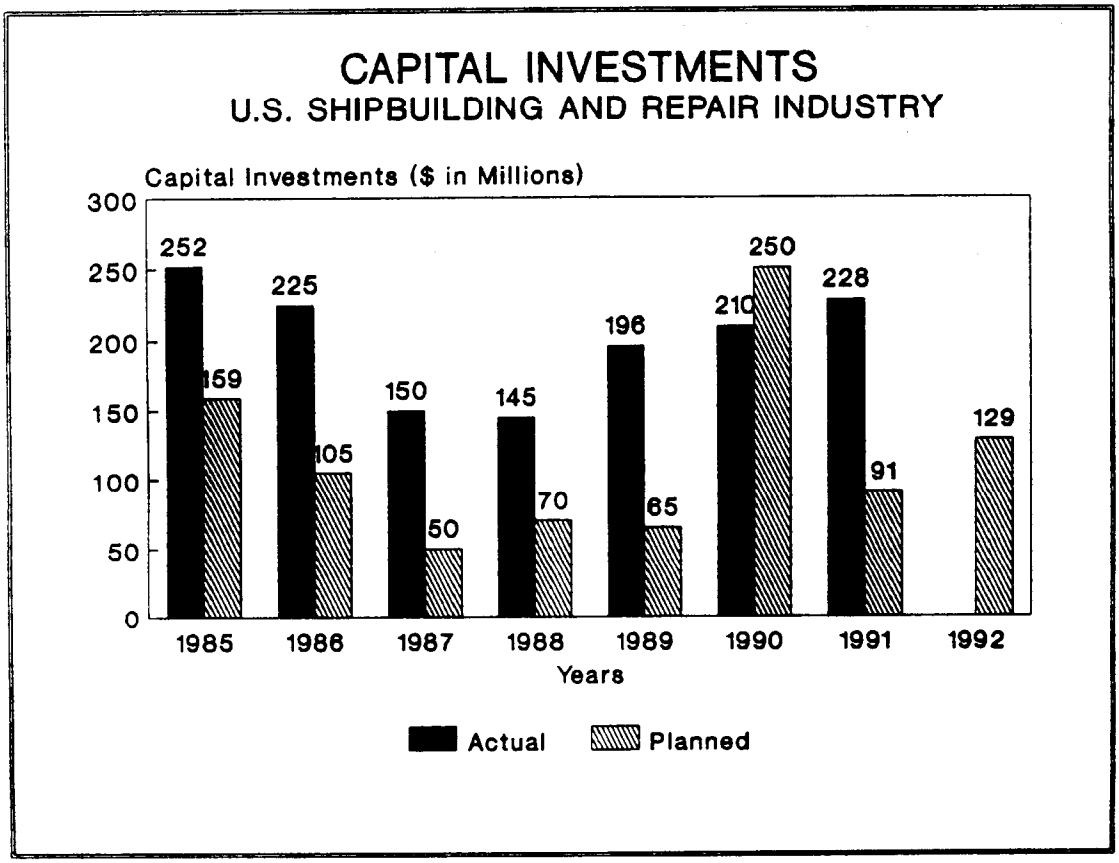
CAPITAL INVESTMENT

During FY 1991, the U.S. ship construction and ship repair industry invested more than $228 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 1992, the industry plans to spend about $129 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 $4.8 billion, and actual expenditures between 1985 and 1991, with the exception of 1990, 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

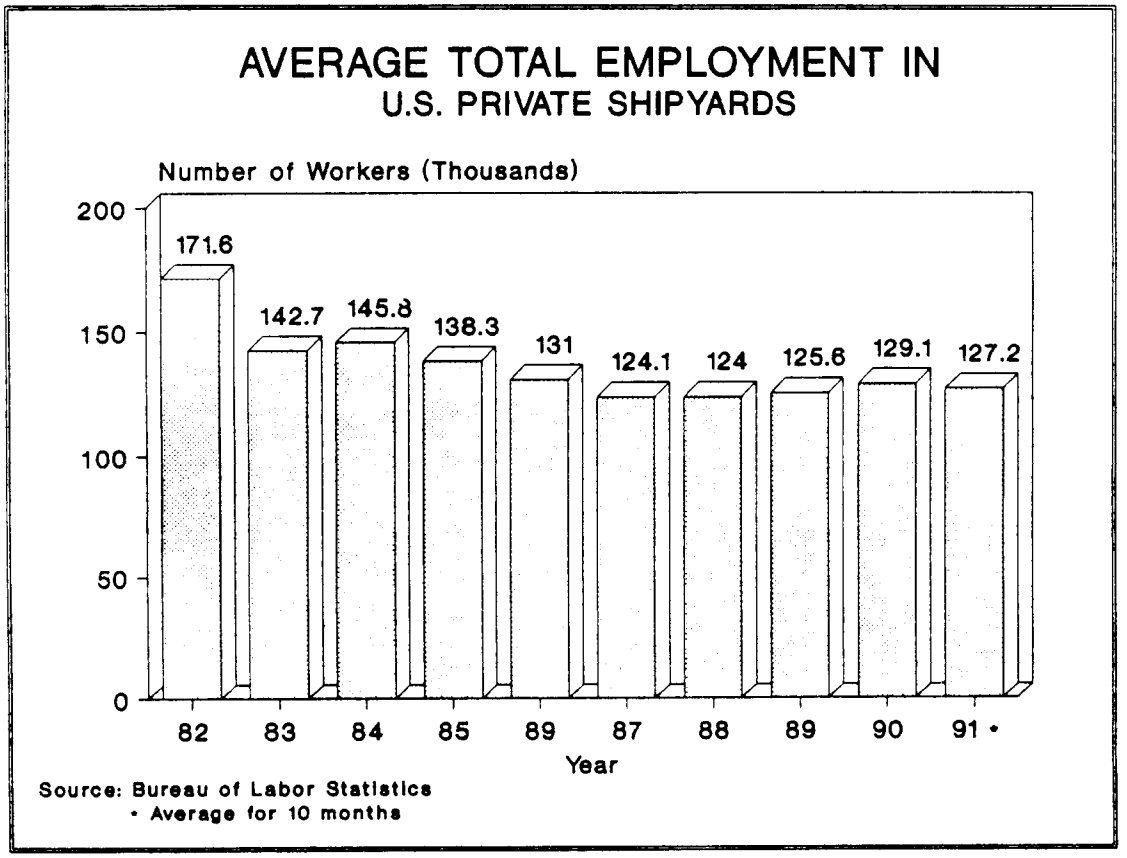


TOTAL EMPLOYMENT IN PRIVATE SHIPYARDS

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 ten months of 1991 was 127,200 (Exhibit 30). This total reflects a decline of 1.5 percent from the reported total average employment for the shipbuilding and repairing industry for 1990.

According to the data published by the BLS, total average employment in the shipbuilding and repairing industry had 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 of the private shipyards in the United States from 1982 through the first ten months of 1991 show an increase from $10.21 to an average of $12.18 (Exhibit 31). During the same period, the average weekly earnings rose from $408.35 to $501.37.

Exhibit 31

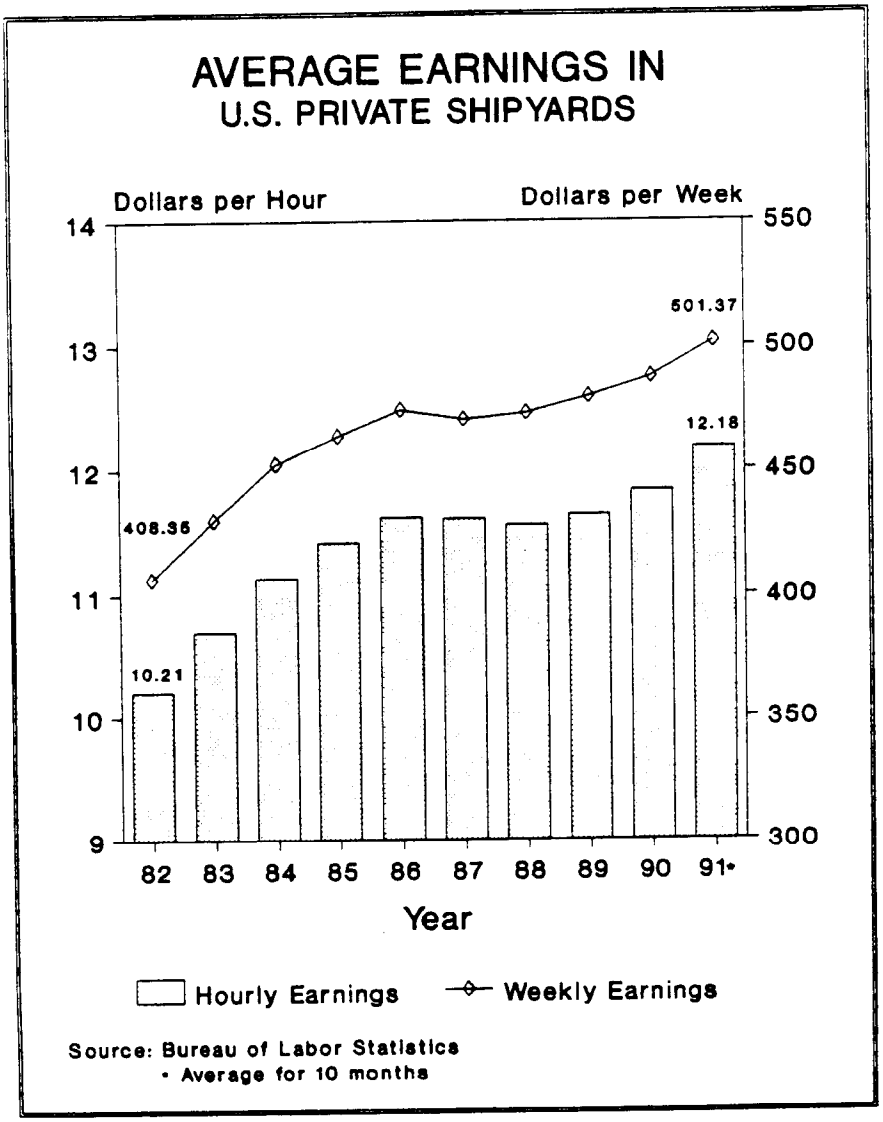


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TABLE 1

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 Position

SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SHIPYARD	BUILDING POSITION 1 (Number)	Metric Units (m) / English Units (ft)	General Cargo						Dry Bulk DWT		
			Gen. Cargo	Mob. Cargo	Container	RO/RO	LASH	Container	21,300	51,000	100,000
		Length (m)	145	221	186	208	272	289	174	183	274
		Beam (m)	21	32	27	31	30	32	23	32	32
		Length (ft)	475	724	610	684	893	947	570	600	900
		Beam (ft)	68	105	90	102	100	105	75	105	105
EAST COAST											
Bath Iron Works		198 X 27 SW / 650 X 88	1	0	1	0	0	0	1	0	0
	(2)	213 X 40 SW / 700 X 130	2	0	2	2	0	0	2	2	0
			3	0	3	2	0	0	3	2	0
BethShip Sparrows Point Yard	(2)	244 X 32 SW / 800 X 106	2	2	2	2	0	0	2	2	0
		365 X 59 GD / 1196 X 194	4	1	3	2	1	1	4	2	1
			6	3	5	4	1	1	6	4	1

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

BUILDING POSITION 1 (Number)		General Cargo						Dry Bulk DWT		
		Gen. Cargo	Mob. Cargo	Container	RO/RO	LASH	Container	21,300	51,000	100,000
	Length (m)	145	221	186	208	272	289	174	183	274
	Beam (m)	21	32	27	31	30	32	23	32	32
	Length (ft)	475	724	610	684	893	947	570	600	900
	Beam (ft)	68	105	90	102	100	105	75	105	105
SHIPYARD	Metric Units (m) / English Units (ft)									
EAST COAST										
Newport News	292 X 37 GD / 958 X 121	2	1	2	1	1	1	2	1	1
	334 X 41 GD / 1097 X 136	2	1	2	1	1	1	2	2	1
	490 X 75 GD / 1609 X 246	9	4	5	4	2	2	6	4	1
		13	6	9	6	4	4	10	7	3
GULF COAST										
Alabama Shipyard	274 X 50 LL / 900 X 164	4	0	0	0	0	0	0	0	0
		4	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

			General Cargo						Dry Bulk DWT		
BUILDING POSITION 1 (Number)			Gen. Cargo	Mob. Cargo	Container	RO/RO	LASH	Container	21,300	51,000	100,000
		Length (m)	145	221	186	208	272	289	174	183	274
		Beam (m)	21	32	27	31	30	32	23	32	32
		Length (ft)	475	724	610	684	893	947	570	600	900
		Beam (ft)	68	105	90	102	100	105	75	105	105
SHIPYARD	Metric Units (m) / English Units (ft)										
GULF COAST											
Avondale	(2)	311 X 53 LL / 1020 X 175	8	2	3	3	2	2	6	3	2
	(2)	265 X 38 LL / 870 X 125	2	2	2	2	0	0	2	2	0
			10	4	5	5	2	2	8	5	2
Ingalls	(5)	257 X 79 LL* / 844 X 260	25	11	13	11	0	0	16	11	0
		469 X 55 LL* / 1540 X 180	3	2	2	2	0	0	2	2	0
			28	13	15	13	0	0	18	13	0

1/ LEGEND

Maximum Ship Size
(LOA x Beam)
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MR = Marine Railway
LL = Land Level Position

SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SHIPYARD	BUILDING POSITION 1 (Number)		General Cargo						Dry Bulk DWT		
			Gen. Cargo	Mob. Cargo	Container	RO/RO	LASH	Container	21,300	51,000	100,000
		Length (m)	145	221	186	208	272	289	174	183	274
		Beam (m)	21	32	27	31	30	32	23	32	32
		Length (ft)	475	724	610	684	893	947	570	600	900
		Beam (ft)	68	105	90	102	100	105	75	105	105
	Metric Units (m) / English Units (ft)										
GULF COAST											
Halter Marine, Inc. Moss Point Division	146 X 20 LL / 480 X 65		1	0	0	0	0	0	0	0	0
			1	0	0	0	0	0	0	0	0
Tampa Shipyards	(2) 226 X 32 GD / 742 X 106		2	2	2	2	0	0	2	2	0
			2	2	2	2	0	0	2	2	0
Trinity-Beaumont	259 X 32 SW / 850 X 105		1	1	1	1	1	0	1	1	0
			1	1	1	1	1	0	1	1	0

* Ship size constrained by maximum launching capability of 259 X 53 meters (850 ft x 173 ft).

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

BUILDING POSITION 1 (Number)			General Cargo						Dry Bulk DWT		
			Gen. Cargo	Mob. Cargo	Container	RO/RO	LASH	Container	21,300	51,000	100,000
		Length (m)	145	221	186	208	272	289	174	183	274
		Beam (m)	21	32	27	31	30	32	23	32	32
		Length (ft)	475	724	610	684	893	947	570	600	900
		Beam (ft)	68	105	90	102	100	105	75	105	105
SHIPYARD	Metric Units (m) / English Units (ft)										
WEST COAST											
National Steel & Shipbuilding Co.	210 X 27 SW / 690 X 90		1	0	1	0	0	0	1	0	0
	(2) 274 X 34 SW / 900 X 110		2	2	2	2	2	0	2	2	2
	299 X 52 GD / 980 X 170		4	1	1	1	1	1	2	1	1
			7	3	4	3	3	1	5	3	3
Portland SRY	145 X 30 LL / 475 X 100		1	0	0	0	0	0	0	0	0
	247 X 33 LL / 810 X 108		1	1	1	1	0	0	1	1	0
			2	1	1	1	0	0	1	1	0

1/ LEGEND

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

SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

			General Cargo						Dry Bulk DWT		
BUILDING POSITION 1 (Number)			Gen. Cargo	Mob. Cargo	Container	RO/RO	LASH	Container	21,300	51,000	100,000
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		Beam (m)	21	32	27	31	30	32	23	32	32
		Length (ft)	475	724	610	684	893	947	570	600	900
		Beam (ft)	68	105	90	102	100	105	75	105	105
SHIPYARD	Metric Units (m) / English Units (ft)										
WEST COAST											
Todd-Seattle	(2)	168 X 18 SW / 550 X 60	1	0	0	0	0	0	1	0	0
			1	0	0	0	0	0	1	0	0
GREAT LAKES *											
Fraser Shipyards		251 X 25 GD / 825 X 82	1	0	0	0	0	0	1	0	0
			1	0	0	0	0	0	1	0	0

* NOTE: Maximum size ship that can exit the St. Lawrence Seaway is 222 meters

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

		General Cargo						Dry Bulk DWT		
BUILDING POSITION 1 (Number)		Gen. Cargo	Mob. Cargo	Container	RO/RO	LASH	Container	21,300	51,000	100,000
	Length (m)	145	221	186	208	272	289	174	183	274
	Beam (m)	21	32	27	31	30	32	23	32	32
	Length (ft)	475	724	610	684	893	947	570	600	900
	Beam (ft)	68	105	90	102	100	105	75	105	105
SHIPYARD	Metric Units (m) / English Units (ft)									
Merce Industries	165 X 21 / 540 X 68 GD	0	0	0	0	0	0	0	0	0
	250 X 24 / 820 X 78 GD	1	0	0	0	0	0	0	0	0
		1	0	0	0	0	0	0	0	0

* NOTE: Maximum size ship that can exit the St. Lawrence Seaway is 222 meters X 24 meters (730 ft x 78 ft).

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

			Tankers							OBO	
BUILDING POSITION 1 (Number)		DWT	25,000	38,000	89,000	120,000	125,000 Cu.m.	225,000	265,000	80,000	160,000
		Length (m)	189	210	272	280	284	335	335	270	304
		Beam (m)	21	27	32	42	43	43	54	32	444
		Length (ft)	620	688	894	920	932	1100	1100	886	998
		Beam (ft)	75	90	105	138	140	140	178	105	143
SHIPYARD		Metric Units (m) / English Units (ft)									
EAST COAST											
Bath Iron Works		198 X 27 SW / 650 X 88	1	0	0	0	0	0	0	0	0
	(2)	213 X 40 SW / 700 X 130	2	2	0	0	0	0	0	0	0
			3	2	0	0	0	0	0	0	0
BethShip Sparrows Point Yard	(2)	244 X 32 SW / 800 X 106	2	2	0	0	0	0	0	0	0
		365 X 59 GD / 1196 X 194	3	2	1	1	1	1	1	1	1
			5	4	1	1	1	1	1	1	1

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

			Tankers							OBO	
BUILDING POSITION 1 (Number)		DWT	25,000	38,000	89,000	120,000	125,000 Cu.m.	225,000	265,000	80,000	160,000
		Length (m)	189	210	272	280	284	335	335	270	304
		Beam (m)	21	27	32	42	43	43	54	32	444
		Length (ft)	620	688	894	920	932	1100	1100	886	998
		Beam (ft)	75	90	105	138	140	140	178	105	143
SHIPYARD		Metric Units (m) / English Units (ft)									
EAST COAST											
Newport News		292 X 37 GD / 958 X 136	1	1	1	0	0	0	0	1	0
		334 X 41 GD / 1097 X 136	1	1	1	0	0	0	0	1	0
		490 X 75 GD / 1609 X 246	6	4	2	1	1	1	1	2	1
			9	7	4	1	1	1	1	4	1
GULF COAST											
Alabama Shipyard	(4)	274 X 50 LL / 900 X 164	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 259 meters X 53 meters (850 ft X 173 ft) vessels.

1/ LEGEND

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(LOA x Beam)
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SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

			Tankers							OBO	
BUILDING POSITION 1 (Number)		DWT	25,000	38,000	89,000	120,000	125,000 Cu.m.	225,000	265,000	80,000	160,000
		Length (m)	189	210	272	280	284	335	335	270	304
		Beam (m)	21	27	32	42	43	43	54	32	444
		Length (ft)	620	688	894	920	932	1100	1100	886	998
		Beam (ft)	75	90	105	138	140	140	178	105	143
SHIPYARD		Metric Units (m) / English Units (ft)									
Avondale	(2)	311 X 53 LL / 1020 X 175	3	3	2	2	2	1	1	2	1
	(2)	265 X 38 LL / 870 X 126	4	3	0	0	0	0	0	0	0
			7	6	2	2	2	1	1	2	1
Ingalls	(5)	257 X 79 LL * / 844 X 260	16	13	0	0	0	0	0	0	0
		469 X 55 LL * / 1540 X 180	2	2	0	0	0	0	0	0	0
			18	15	0	0	0	0	0	0	0
Halter Marine, Inc. Moss Point Division		146 X 20 SW / 480 X 65	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0

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SHIP CONSTRUCTION CAPABILITY
BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

			Tankers							OBO	
BUILDING POSITION 1 (Number)		DWT	25,000	38,000	89,000	120,000	125,000 Cu.m.	225,000	265,000	80,000	160,000
		Length (m)	189	210	272	280	284	335	335	270	304
		Beam (m)	21	27	32	42	43	43	54	32	444
		Length (ft)	620	688	894	920	932	1100	1100	886	998
		Beam (ft)	75	90	105	138	140	140	178	105	143
SHIPYARD		Metric Units (m) / English Units (ft)									
Tampa Shipyards	(2)	226 X 32 GD / 742 X 106	2	2	0	0	0	0	0	0	0
			2	2	0	0	0	0	0	0	0
Trinity-Beaumont		259 X 32 SW / 850 X 105	1	1	1	0	0	0	0	0	0
			1	1	1	0	0	0	0	0	0

1/ LEGEND

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(LOA x Beam)
SW = Shipway
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BY
SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

			Tankers							OBO	
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		Length (m)	189	210	272	280	284	335	335	270	304
		Beam (m)	21	27	32	42	43	43	54	32	444
		Length (ft)	620	688	894	920	932	1100	1100	886	998
		Beam (ft)	75	90	105	138	140	140	178	105	143
SHIPYARD		Metric Units (m) / English Units (ft)									
WEST COAST											
National Steel & Shipbuilding Co.		210 X 27 SW / 690 X 90	1	1	0	0	0	0	0	0	0
	(2)	274 X 34 SW / 900 X 110	2	2	2	0	0	0	0	2	0
		299 X 52 GD / 980 X 170	2	1	1	1	1	0	0	1	0
			5	4	3	1	1	0	0	3	0
Portland SRY		145 X 30 LL / 475 X 100	0	0	0	0	0	0	0	0	0
		247 X 33 / 810 X 108	1	1	0	0	0	0	0	0	0
			1	1	0	0	0	0	0	0	0

1/ LEGEND

Maximum Ship Size
(LOA x Beam)
SW = Shipway
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BY
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		Length (m)	189	210	272	280	284	335	335	270	304
		Beam (m)	21	27	32	42	43	43	54	32	444
		Length (ft)	620	688	894	920	932	1100	1100	886	998
		Beam (ft)	75	90	105	138	140	140	178	105	143
SHIPYARD		Metric Units (m) / English Units (ft)									
Todd-Seattle	(2)	168 X 18 SW / 550 X 60	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0
GREAT LAKES *											
Fraser Shipyards		251 X 25 GD / 825 X 82	1	0	0	0	0	0	0	0	0
			1	0	0	0	0	0	0	0	0
Merce Industries		165 X 21 GD / 540 X 68	0	0	0	0	0	0	0	0	0
		207 X 24 GD / 820 X 78	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 222 meters X 24 meters (730 ft X 78 ft).

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SUMMARY

	General Cargo						Dry Bulk DWT		
	Gen. Cargo	Mob. Cargo	Container	RO/RO	LASH	Container	21,300	51,000	100,000
Length (m)	145	221	186	208	272	289	174	183	274
Beam (m)	21	32	27	31	30	32	23	32	32
Length (ft)	475	724	610	684	893	947	570	600	900
Beam (ft)	68	105	90	102	100	105	75	105	105
REGION									
EAST COAST	22	9	17	12	5	5	19	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	80	33	45	37	11	8	56	38	9

SHIP CONSTRUCTION CAPABILITY BY SHIP TYPES HISTORICALLY DELIVERED TO COMMERCIAL SERVICE

SUMMARY

		Tankers							OBO	
	DWT	25,000	38,000	89,000	120,000	125,000 Cu.m.	225,000	265,000	80,000	160,000
	Length (m)	189	210	272	280	284	335	335	270	304
	Beam (m)	21	27	32	42	43	43	54	32	44
	Length (ft)	620	688	894	920	932	1100	1100	886	998
	Beam (ft)	75	90	105	138	140	140	178	105	143
REGION										
EAST COAST		17	13	5	2	2	2	2	5	2
GULF COAST		28	24	3	2	2	1	1	2	1
WEST COAST		7	5	3	1	1	0	0	3	0
GREAT LAKES *		1	0	0	0	0	0	0	0	0
TOTAL POSITIONS - ALL YARDS		53	42	11	5	5	3	3	10	3

* NOTE: Maximum size ship that can exit the St. Lawrence Seaway is 222 meters X 24 meters (730 ft X 78 ft).

TABLE 2

NUMBER OF SHIPBUILDING POSITIONS BY LENGTH

(MAXIMUM SHIP SIZE)

NUMBER OF SHIPBUILDING POSITIONS 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
(In meters):	122	137	152	168	183	198	213	229	244	259	274	290	305	320	335	351	366	396	427	488
EAST COAST																				
Bath Iron Works	3	3	3	3	3	3	2													
Beth-Baltimore Marine Division	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1				
General Dynamics, E. Boat **																				
Intermarine	1	1	1																	
Newport News SB & DD	7	7	7	7	7	3	3	3	3	3	3	3	2	2	1	1	1	1	1	1
TOTAL	(14)	(14)	(14)	(13)	(13)	(9)	(8)	(6)	(6)	(4)	(4)	(4)	(3)	(3)	(2)	(2)	(1)	(1)	(1)	(1)
GULF COAST																				
Alabama Shipyards	1	1	1	1	1	1	1	1	1	1	1									
Avondale Shipyards	6	6	5	5	5	5	5	5	5	5	2	2	2							
Halter Moss Point	1	1																		
Ingalls	6	6	6	6	6	6	6	6	6	1										
Tampa Shipyards	2	2	2	2	2	2	2													
Trinity - Beaumont	1	1	1	1	1	1	1	1	1	1										
TOTAL	(17)	(17)	(15)	(15)	(15)	(15)	(15)	(13)	(13)	(8)	(3)	(2)	(2)							
WEST COAST																				
National Steel & SB	4	4	4	4	4	4	3	3	3	3	3	1								
Portland Ship Repair	2	2	1	1	1	1	1	1	1											
Tacoma Boat	4																			
Todd-Seattle	2	2	2	2																
TOTAL	(12)	(8)	(7)	(7)	(5)	(5)	(4)	(4)	(4)	(3)	(3)	(1)								
GREAT LAKES ***																				
Erie Marine	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Fraser Shipyards	2	2	2	2	2	1	1	1	1											
Marinette Marine	1																			
Merce Industries	2	2	2	1	1	1	1	1	1											
Peterson Builders	1																			
TOTAL	(7)	(5)	(5)	(4)	(4)	(3)	(3)	(3)	(3)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)			
GRAND TOTAL ALL COASTS AND GREAT LAKES	(50)	(44)	(41)	(39)	(37)	(32)	(30)	(26)	(26)	(16)	(11)	(8)	(6)	(4)	(3)	(3)	(2)	(1)	(1)	(1)

* Including Shipways, Graving Docks and Land Level positions.
** 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

Standard Form 17 (Rev. 7-90)

DEPARTMENT OF THE NAVY (NAVSEASYSCOM) & MARITIME ADMINISTRATION Coordinator for Ship Repair and Conversion (DOD-DOC)

FACILITIES AVAILABLE FOR THE CONSTRUCTION OR REPAIR OF SHIPS

Form Approved
OMB No. 0703-0006
Expires Dec 31, 1992

Public reporting burden for this collection of information is estimated to average 4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0703-0006), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to the appropriate Department of Defense Office or Maritime Administration.

DATE

TO: *(Complete departmental address)*

SHIPYARD AND ADDRESS

INSTRUCTIONS

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

BUILDING WAYS (M.L.W.)

NO. OF WAY	LAUNCHING (X one)		DIMENSIONS	MAXIMUM SHIP SIZE (Ton 2,240 lbs.)	DEPTH OF WATER: OVER WAY END	DEPTH OF WATER: AT DROP OFF	CONDITION OF WAY	CRANES SERVING WAY: NO.	CRANES SERVING WAY: TYPE (Plus hook height for bridge cranes)	CRANES SERVING WAY: LIFT CAPACITY (Std. Tons)
		End	Length	Length O.A.						
		Side	Width	Beam						
		Basin	Depth	Weight						
		End	Length	Length O.A.						
		Side	Width	Beam						
		Basin	Depth	Weight						
		End	Length	Length O.A.						
		Side	Width	Beam						
		Basin	Depth	Weight						
		End	Length	Length O.A.						
		Side	Width	Beam						
		Basin	Depth	Weight						
		End	Length	Length O.A.						
		Side	Width	Beam						
		Basin	Depth	Weight						
		End	Length	Length O.A.						
		Side	Width	Beam						
		Basin	Depth	Weight						
		End	Length	Length O.A.						
		Side	Width	Beam						
		Basin	Depth	Weight						
		End	Length	Length O.A.						
		Side	Width	Beam						
		Basin	Depth	Weight						
		End	Length	Length O.A.						
		Side	Width	Beam						
		Basin	Depth	Weight						
		End	Length	Length O.A.						
		Side	Width	Beam						
		Basin	Depth	Weight						

LENGTH OF LAUNCHING RUN	DEPTH OF RUN AT M.L.W.	TIDAL RANGE *(Difference M.L.-M.H.)*	IS FIRE PROTECTION AVAILABLE ON BUILDING WAY? ☐ YES ☐ NO	IS SNUBBING NECESSARY? ☐ YES ☐ NO

Merchant Marine Act of 1936, as amended.

Previous editions are obsolete.

1142/208

SHIP'S 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.*)	LIFT CAPACITY (*Std. Tons*)
		Act.								Lift
		Use.								Reach
		Act.								Lift
		Use.								Reach
		Act.								Lift
		Use.								Reach
		Act.								Lift
		Use.								Reach
		Act.								Lift
		Use.								Reach
		Act.								Lift
		Use.								Reach
		Act.								Lift
		Use.								Reach
		Act.								Lift
		Use.								Reach

DRYDOCKS (mean HIGH water) (*List building docks under building ways*)

DOCK NO.	MATERIAL CONSTD. OF-TYPE FLOATING - (FD); GRAVING - (GD); MARINE RAILWAY - (MR)	MAXIMUM SHIP SIZE ACCOMMODATED LENGTH OA-BEAM	LENGTH			CLEAR WIDTH		DEPTH / DRAFT			LIFTING CAPACITY (*Ton 2,240 lbs.*)
			OVERALL	AT COPING (GD); ON PONTOONS (FD)	AT KEEL BLOCKS; ON CRADLE (MR)	AT TOP; CRADLE (MR)	AT KEEL BLOCKS	OVER SILL (GD)	OVER FLOOR	OVER KEEL BLOCKS	

LEGEND: (Abbreviations of Services)

Fresh water .... F.W. - G.P.M. - P.S.I.
Salt water .... S.W. - G.P.M. - P.S.I
Steam .... S - P/HR - 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 .... FP - G.P.M. - P.S.I
Sanitary sewer .... SS - Yes or No

Standard Form 17 (Rev. 7-90)

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)	
			WIDTH	HEIGHT		
FABRICATING						
PLATE						
SHEET METAL						
SUBASSEMBLY						
CARPENTER						
WOODWORKING						
BOAT ASSEMBLY OR MOLDING						
MACHINE						
ELECTRICAL						
ELECTRONIC						
PIPE						
GALVANIZING						
FOUNDRY						
RIGGER						

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

SHOP OR YARD CRANES (5 tons or over)

BRIDGE TYPE				STATIONARY, RAIL OR MOBILE							
CAP. (Std. tons)	MAX. SPAN	HEIGHT OF HOOK	AREA / SHOP SERVICED	TYPE	CAP. (Std. tons)	MAX. REACH	CAPACITY AT REACH	BOOM LENGTH	HEIGHT HINGE	AREA SERVICED	HGT. OF HOOK ABOVE BASE AT OUT REACH

Standard Form 17 (Rev. 7-90)

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 lathe 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

LOCATION OF PRODUCTION FACILITIES FOR PRODUCTS LISTED IN ITEM 8 OF STD. FORM 129	ON WATERFRONT ☐ YES ☐ NO

EMPLOYMENT	CURRENT	CURRENT NO. SHIFTS	MOBILIZATION - SHIFTS	
MANAGEMENT, ADMINISTRATION				
PROFESSIONAL, ENGINEERING				
PROFESSIONAL, TECHNICAL *(all others)*				
PRODUCTION, SKILLED				
PRODUCTION, SEMISKILLED				
PRODUCTION, UNSKILLED				
NONPRODUCTION				
TOTAL				

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

CONSTRUCTION (**): REPAIR (** **).**

APPROXIMATE TOTAL EMPLOYMENT OF ALL AFFILIATED CONCERNS ONLY LISTED IN ITEM 6, 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 OVERLAND TRANSPORTATION OF FINISHED PRODUCTS *(Not to exceed limitations imposed by local ordinances)*

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

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

LIMITING LOCK DIMENSIONS TO TIDEWATER *(Identify locks)*

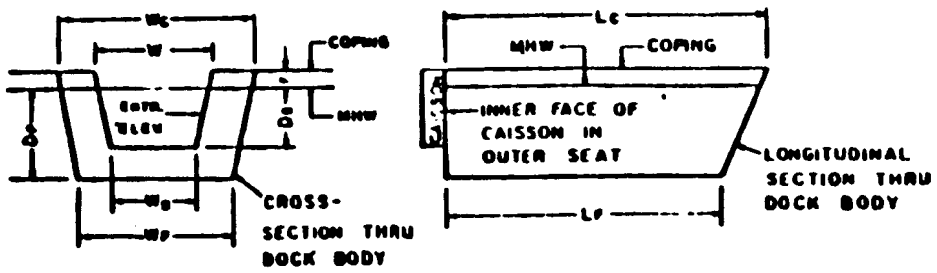
PROJECTS UNDER CONSTRUCTION WHICH WILL ALTER NAVIGATIONAL RESTRICTIONS *(Specify projects and state effect and estimated completions)*

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.)

GRAVING DRYDOCK CHARACTERISTICS SUMMARY

GRAVING DRYDOCK NOMENCLATURE



KEY

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

DRY DOCK NUMBER	LENGTH		ENTRANCE DIMENSIONS			DOCK BODY DIMENSIONS				SUPERFLOODING	STANDARD DEFINITION	A.C. AMPERES (60 HZ-3Ø)			REMARKS
			WIDTH		DEPTH	WIDTH		DEPTH	FREEBOARD			480V	2400V	13.2KV	
	FLOOR L_F	COPING L_C	SILL W_S	COPING W	MHW D_S	FLOOR W_F	COPING W_C	MHW D_F	F		$L_C \times W_C \times D_S / D_F$	Max. Hotel (Indus)	Alt. Hotel *	Dept/ Check **	(e.g. indicate dimensions of pits in dock floor)

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

**Dept and Check-out Power Consists of 13,200 V Supply and 3,750 KVA (480V SEC.) Portable Transformer.

FLOATING DRYDOCK CHARACTERISTICS SUMMARY

FLOATING DRYDOCK	MAXIMUM LENGTH OF PONTOON	MAXIMUM DEPTH OVER BLOCKS	CLEAR WIDTH BETWEEN WINGWALLS	LIFT CAPACITY (TONS)	NORMAL KEEL BLOCK HEIGHT	A.C. AMPHERES (60HZ-3Ø)			REMARKS (Indicate existence of hauling blocks, if end selection can be lowered, and max. length of ship DD can accomodate).
						480V MAX. HOTEL (Indus.)	2400V ALT. HOTEL	13.2KV TEST/ CHECK	

INTENTIONALLY LEFT BLANK

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 121.91 m (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 Longest Total linear	Remarks 1/ Type of work usually engaged in 2/ Employment - Mid-1991
EAST COAST	Metric Units (Meters)		
Shipbuilding Yards	English Units (Feet)		
Bath Iron Works Corp. 700 Washington Street Bath, ME 04530	198 X 27 SW (2) 213 X 40 SW	259 869	1/ Construction, conversion and repairs - all types of vessels. 2/ 9,504
	650 X 88 SW (2) 700 X 130 SW	850 2850	
BethShip Sparrows Point Yard Sparrows Point, MD 21219	(2) 244 X 32 SW 365 X 59 GD 274 X 40 FD	384 1920	1/ Construction, conversion and repairs of marine vessels. 2/ 539
	(2) 800 X 106 SW 1196 X 194 GD 900 X 131 FD	1260 6298	
General Dynamics Electric Boat Division 75 Eastern Point Road Groton, CT 06340-4989		229 1067	1/ Engaged exclusively in construction of submarines for the U.S. Navy. 2/ 18,001
		750 3501	
Intermarine, USA 301 North Lathrop Avenue P.O. Box 3045 Savannah, GA 31402-3045	162 X 19 GD *	122 238	1/ MHC construction. 2/ 485 * Can accomodate ship up to 366 m (1,200 ft) in length.
	533 X 63 GD *	400 780	

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 121.91 m (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-1991
EAST COAST	Metric Units		
Shipbuilding Yards	English Units		
Newport News Shipbuilding 4101 Washington Avenue Newport News, VA 23607	292 X 37 GD * 334 X 41 GD * 197 X 27 GD ** 262 X 31 GD ** 139 X 21 GD ** 159 X 21 GD ** 490 X 75 GD * 195 X 41 FD (4)183 X 12 LL	418 4196	1/ Construction, conversion and repairs - all types of vessels. 2/ 27,000 * Used for construction. ** Used for repair and overhaul.
	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 (4)600 X 40 LL	1370 13768	

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 121.91 m (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-1991
EAST COAST **Repair Yards with Drydock Facilities**	Metric Units English Units		
Atlantic Dry Dock Corp. 8500 Heckscher Drive Jacksonville, FL 32226-3311	152 X 27 MR	178 562	1/ Construction of small vessels. Repair and overhaul of small and medium size vessels. 2/ 613 * * Includes Atlantic Marine's Fort George Island employees.
	500 X 90 MR	585 1845	
Bath Iron Works Corp. 40 Commercial St. Portland, ME 04101	257 X 41 FD 168 X 27 FD	305 457	1/ Ship repairs and conversion. 2/ 1,301
	844 X 136 FD 550 X 88 FD	1000 1500	
Boston Graving Dock Corp. 256 Marginal Street East Boston, MA 02128	130 X 23 FD	311 948	1/ General ship repair. 2/ 112
	425 X 76 FD	1020 3111	
Economic Development and Industrial Corp. of Boston (EDIC) 38 Chauncy Street Boston, MA 02211	350 X 34 GD	274 488	1/ Leases public drydock in former Boston Naval Annex to local ship repair companies. 2/ N/A
	1149 X 111 GD	900 1600	

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 121.91 m (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-1991
EAST COAST **Repair Yards with Drydock Facilities**	Metric Units English Units		
Caddell Dry Dock & Repair Company, Inc. P.O. Box 327 Staten Island, NY 10310	137 X 25 FD	288 / 939	1/ General ship repair. 2/ 225
	450 X 81 FD	946 / 3082	
Colonna's Shipyard, Inc. 400 E. Indian River Rd. Norfolk, VA 23523	128 X 21 MR	274 / 815	1/ General ship repairs. 2/ 333
	420 X 70 MR	900 / 2675	
Detyens Shipyard, Inc. Rt. 2, Box 180 Mt. Pleasant, SC 29464	152 X 25 FD 152 X 20 FD	155 / 311	1/ General ship repair and conversion. 2/ 312
	500 X 83 FD 500 X 66 FD	510 / 1022	
G. Marine Diesel of New York P.O. Box 050221 Brooklyn, NY 11205	(2) 330 X 43 GD	233 / 233	1/ General ship repair. 2/ 70
	(2) 1082 X 141 GD	765 / 765	

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 121.91 m (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-1991
EAST COAST **Repair Yards with Drydock Facilities**	Metric Units English Units		
General Ship Corp. 400 Border Street East Boston, MA 02128-2533	208 X 24 GD*	274 / 771	1/ Ship repairs, overhauls and modernizations. 2/ 129 * GD is long-term leased from Boston Marine Industrial Park in the former Boston Naval Annex.
	683 X 78 GD *	900 / 2530	
Jacksonville Shipyards Bellinger Division 13911 Atlantic Blvd. Jacksonville, FL 32211	122 X 16 FD	108 / 281	1/ Ship repair and conversion. 2/ 98
	400 X 53 FD	355 / 922	
Jonathan Corporation 701 Front Street Norfolk, VA 23510	198 X 255 FD	124 / 245	1/ Ship repair and overhaul. 2/ 516
	650 X 82 FD	406 / 804	
Metro Machine Corp. P.O. Box 1860 Norfolk, VA 23501	206 X 29 FD	239 / 850	1/ Ship repairs and conversion. 2/ 809
	675 X 95 FD	785 / 2790	

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 121.91 m (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-1991
EAST COAST **Repair Yards with Drydock Facilities**	Metric Units English Units		
New York Shipyard Corp. One Beard Street Brooklyn, NY 11231	217 X 27 GD 216 X 32 FD 145 X 23 FD	351 1280	1/ General ship repairs. 2/ 350
	712 X 89 GD 710 X 106 FD 475 X 77 FD	1152 4200	
Norfolk Shipbuilding & Drydock Corporation P.O. Box 2100 Foot of Liberty Street Norfolk, VA 23501-2100	229 X 29 FD 316 X 48 FD	314 2388	1/ Ship conversion and repairs - all types of vessels. 2/ 2,879
	750 X 96 FD 1036 X 156 FD	1030 7835	
Robert E. Derecktor of Rhode Island, Inc. Coddington Cove Middletown, RI 02840	198 X 32 FD 1221 X 32 FD	465 1379	1/ Construction of Coast Guard ships and vessel repairs. 2/ 120
	650 X 106 FD 400 X 106 FD	1525 4525	
Westly Thomas Marine, Inc. Building #62 Brooklyn Navy Yard Brooklyn, NY 11205	219 X 34 GD	219 730	1/ General Ship repair. 2/ 43
	717 X 110 GD	720 2395	

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 121.91 m (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-1991
EAST COAST	Metric Units / English Units		
Topside Repair Yards			
American Shipyard Corp. One Washington Street Newport, RI 02840		731 / 1615 2400 * / 5300	1/ General ship repair. 2/ 140 * Includes Quonset Point facility.
Associated Naval Architects, Inc. 3400 Shipwright Street Portsmouth, VA 23703		137 / 439 450 / 1440	1/ General ship repair and overhaul. 2/ 82
Braswell Shipyards 60 Braswell St. Charleston, SC 29405		219 / 271 720 / 890	1/ Ship repairs and conversion. 2/ 330
Delta Marine, Inc. P.O. Box 2191, Hwy 421 North Wilmington, NC 28402		274 / 351 900 / 1150	1/ General ship repair. 2/ 71
General Ship Repair Corp. 1449 Key Highway Baltimore, MD 21230		133 / 258 435 / 845	1/ General ship repair. 2/ 46

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 121.91 m (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-1991
EAST COAST	Metric Units		
Topside Repair Yards	English Units		
Gowen, Inc. 72 Commercial Street Portland, ME 04104		152 457	1/ General ship repair. 2/ 10
		500 1500	
Jacksonville Shipyards Commercial Division P.O. Box 2347 Jacksonville, Fl 32203		244 1854	1/ Ship repair and conversion. 2/ 223
		800 6084	
JOMAR Corporation of Tidewater P.O. Box 5119 Suffolk, VA 23435		183 183	1/ General ship repair. 2/ 39
		600 600	
Jonathan Corporation Little Creek Shipyard Virginia Beach, VA 23455		170 340	1/ General ship repair and overhaul. 2/ 100
		558 1116	
M & W Marine Service, Inc. 601 Jefferson Ave. Newport News, VA 23607-6113		183 183	1/ General ship repair. 2/ 36
		600 600	

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 121.91 m (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-1991
EAST COAST	Metric Units		
Topside Repair Yards	English Units		
Marine Hydraulics International, Inc. 800 East Indian River Rd. Norfolk, VA 23523		183 396 600 1300	1/ General ship repair. 2/ 234
Melville Marine Industries One Little Harbor Landing Portsmouth, RI 02871		366 366 1200 1200	1/ General ship repair. 2/ 175
Metal Trades, Inc. P.O. Box 129 Hollywood, SC 29449-0129		98 171 320 * 560	1/ General ship repair. 2/ 129 * Can do topside repair to vessel 122 meters (400 ft.) in length.
Moon Engineering Co. 545 Front Street Norfolk, VA 23510		168 168 550 550	1/ General ship repair, primarily for Navy. 2/ 113

MAJOR U.S. SHIPBUILDING AND REPAIR FACILITIES
(Vessels 121.91 m (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-1991
EAST COAST	Metric Units		
Topside Repair Yards	English Units		
Moon Engineering Two Harper Avenue Portsmouth, VA 23707		187 374	1/ General ship repairs. 2/ 230
		613 1226	
Norfolk Shipbuilding & Drydock Corporation Brambleton Division Norfolk, VA 23501		183 1252	1/ Ship conversion and repairs - all types of vessels. 2/ 508
		600 4109	
North Florida Shipyards, Inc. P.O. Box 3255 Jacksonville, FL 32206		290 966	1/ Ship repairs and conversion. 2/ 532
		950 3170	
Promet Marine Services Corp. 242 Allens Ave. Providence, RI 02905		229 686	1/ General ship repair. 2/ 30
		750 2250	1/ General ship repair.
Reynolds Shipyard Corp. 200 Edgewater Street P.O. Box 0500/10 Staten Island, NY 10305		134 134	1/ General ship repairs. 2/ 20
		440 440	

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EAST COAST	Metric Units		
Topside Repair Yards	English Units		
Steel Style, Inc. 401 South Water Street Newburgh, NY 12550		152 183 500 600	1/ General ship repair. 2/ 17
Virginia Drydock Co. 307 Campostella Rd. Norfolk, VA 23523		152 305 500 1000	1/ General ship repair. 2/ 65

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GULF COAST	Metric Units		
Shipbuilding Yards	English Units		
Alabama Shipyard, Inc. P.O. Box 3201 Mobile, AL 36652	274 X 50 LL	328 642	1/ Ship construction, conversion and repairs. 2/ 239
	900 X 164 LL	1075 2107	1/ Ship construction, conversion and repairs.
Avondale Industries, Inc. P.O. Box 50280 New Orleans, LA 70150-0280	(2) 311 X 53 LL * 305 X 66 FD * (2) 265 X 38 LL ** 265 X 38 SW ** 229 X 35 FD ** 137 X 27 SW ***	1006 1431	1/ Modular ship construction, conversion, and repairs - all types of vessels. 2/ 7,211 3/ Can accommodate ship up to 366 meters (1200 ft) in length. * Upper main yard. ** Lower main yard. *** Westwego Plant.
	(2) 1020 X 175 LL * 1000 X 216 FD * (2) 870 X 126 LL ** 870 X 126 SW ** 750 X 114 FD ** 450 X 90 SW ***	3301 4694	
Ingalls Shipbuilding, Inc. P.O. Box 149 Pascagoula, MS 39568-0149	2597 X 53 FD * (5) 257 X 79 LL * 469 X 55 LL *	808 3002	1/ Construction, conversion, and repairs - all types of vessels. 2/ 15,531 * West Bank can only launch ships up to 259 meters X 53 meters (850 ft X 173 ft). Land Level Positions constrained by launching capability.
	850 X 173 FD * (5) 844 X 260 LL * 1540 X 180 LL *	2650 9850	

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GULF COAST	Metric Units		
Shipbuilding Yards	English Units		
Halter Marine, Inc. Moss Point Division P.O. Box 767 Moss Point, MS 39563	146 X 20 LL	146 376	1/ Construction, conversion and repair of ships, boats, barges. 2/ 261
	480 X 65 LL	480 1235	
Tampa Shipyards, Inc. P.O. Box 1277 Tampa, FL 33601	165 X 22 GD * 273 X 45 GD * (2) 226 X 32 GD **	258 1103	1/ Ship construction, conversion and repairs. 2/ 1,142 * Used for ship repair. ** Used for ship construction.
	542 X 72 GD * 896 X 146 GD * (2) 742 X 106 GD**	845 3620	
Trinity Industries - Beaumont Division P.O. Box 3600 Beaumont, TX 77704	259 X 32 SW	328 1041	1/ Ship construction, conversion and repair. 2/ 95
	850 X 105 SW	1075 3415	

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GULF COAST **Repair Yards with Drydock Facilities**	Metric Units English Units		
Atlantic Marine, Inc. - Mobile P.O. Box 3202 Mobile, AL 36652	213 X 26 FD 305 X 49 FD	345 990	1/ Ship repairs and overhaul. 2/ 505
	700 X 86 FD 1000 X 160 FD	1132 3247	
Bender Shipbuilding & Repair Co., Inc. 265 South Water Street Mobile, AL 36601	201 X 27 FD 126 X 17 FD 126 X 14 FD 183 X 36 FD	188 544	1/ Construction of vessels up to 91.44 meters (300 ft) in length. Also repairs and conversion. 2/ 900
	660 X 89 FD 414 X 55 FD 414 X 45 FD 600 X 118 FD	617 1784	
BethShip Sabine Yard P.O. Box 1448 Port Arthur, TX 77641	274 X 36 FD	213 213	1/ Repair of ships and offshore oil rigs. 2/ 250
	900 X 118 FD	700 700	
Bludworth Bond Shipyard Inc. P.O. Box 5065 8114 Huckley Houston, TX 77262-5065	133 X 24 FD *	366 366	1/ General ship repairs. 2/ 72 * Two drydocks are combined.
	435 X 80 FD *	1200 1200	

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GULF COAST **Repair Yards with Drydock Facilities**	Metric Units English Units		
Newpark Shipbuilding & Repair, Inc. 8502 Cypress Houston, TX 77012	130 X 24 FD	152 488	1/ Small vessel construction and repairs. 2/ 258
	425 X 80 FD	500 1600	
Texas Drydock, Inc. P.O. Box 968 Orange, TX 77631-0968	168 X 37 FD	305 579	1/ General ship repair. 2/ 100
	550 X 120 FD	1000 1900	

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GULF COAST	Metric Units		
Topside Repair Yards	English Units		
American Marine Corp. 3900 Jourdan Rd. P.O. Box 8126 New Orleans, LA 70182		549 549 1800 1800	1/ Construction and repair of offshore oil vessels and barges. 2/ 180
AMFELS, Inc. Hwy. 48, P.O. Box 3107 Brownsville, TX 78523		610 610 2000 2000	1/ General ship repair. 2/ 392
Avondale Industries, Inc. Algiers Division 3103 Patterson Drive New Orleans, LA 70114		588 1112 1930 3648	1/ Ship conversion, repair, and overhaul. 2/ 51
Boland Marine Manufacturing Co., Inc. P.O. Box 53287 New Orleans, LA 70153		319 319 1046 1046	1/ General ship repairs. 2/ 157

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GULF COAST	Metric Units		
Topside Repair Yards	English Units		
Bollinger Machine Shop and Shipyard, Inc. P.O. Box 250 Lockport, LA 70374-0250		1646 3712	1/ Coast Guard vessel construction. 2/ 737 * Max ship = 122 meters LOA (400 ft).
		5400 12180	
Buck Kreihs Co., Inc. 2225 Tchoupitoulas St. New Orleans, LA 70130		341 341	1/ Ship repairs and conversion. 2/ 294 * Max ship = 121.91 meters LOA (400 ft).
		1120 1120	
Coastal Marine Service of Texas, Inc. 1051 Houston Avenue Port Arthur, TX 77640		0 0	1/ General ship repair. 2/ 156 (subcontracted) * Vessels berthed alongside waterfront barges.
		0 0	
Dixie Machine Welding & Metal Works, Inc. 1031 Anunciation St. New Orleans, LA 70130		335 335	1/ General ship repairs. 2/ 140
		1100 1100	

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GULF COAST	Metric Units		
Topside Repair Yards	English Units		
Fredeman Shipyard, Inc. P.O. Box 129 Sulphur, LA 70664-0129		137 518	1/ Construction and repair of offshore vessels. 2/ 110
		450 1700	
Gulf Copper & Manufacturing Corp. 320 Houston Avenue Port Arthur, TX 77640		98 290	1/ General ship repair. 2/ 80
		320 950	
Gulf Marine Repair Corp. 1200 Sertoma Drive Tampa, FL 36605		152 152	1/ Ship repairs and overhaul. 2/ 145
		500 500	
Halter Marine, Inc. Equitable Shipyards 4325 France Road New Orleans, LA 70126		122 402	1/ Construction and repair of small vessels and barges. 2/ 546
		400 1318	
Hendry Corp. 5107 S. Westshore Blvd. Tampa, FL 33611		305 305	1/ General ship repairs. 2/ 106
		1000 1000	

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GULF COAST	Metric Units		
Topside Repair Yards	English Units		
Houston Ship Repair, Inc. Brady Island Ship Repair Facility 8510 Cypress Street Houston, TX 77012		259 259 850 850	1/ General ship repair and conversion. 2/ 100
Houston Ship Repair, Inc. Orange Division P.O. Box 2392 Orange, TX 77630		229 625 750 2050	1/ General ship repair and conversion. 2/ 87
International Ship Repair & Marine Services, Inc. 1616 Penny Street Tampa, FL 33605		305 661 1000 2170	1/ General ship repair. 2/ 152
Jay Bludworth, Inc. P.O. Box 2441 Corpus Christi, TX 78403		152 975 500 3200	1/ General ship repair. 2/ 44

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GULF COAST	Metric Units		
Topside Repair Yards	English Units		
John Bludworth Marine, Inc. 1600 N. Witter Pasadena, TX 77506		259 826	1/ General ship repair. 2/ 148
		850 2710	
McDermott, Inc. P.O. Box 188 Morgan City, LA 70381		143 363	1/ Construction and repair of tugs, supply boats, barges, and drill rigs. 2/ 732
		470 1190	
Textron Marine Systems 19401 Chef Menteur Hwy New Orleans, LA 70129		274 488	1/ LCAC construction. 2/ 605
		900 1600	
Vessel Repair, Inc. P.O. Box 2207 Port Arthur, TX 77643		335 640	1/ General ship repair. 2/ 65
		1100 2100	
Violet Dock Port, Inc. 6800 E. St. Bernard Hwy Violet, LA 70092		305 1432	1/ General ship repair. 2/ 40
		1000 4700	

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WEST COAST	Metric Units		
Shipbuilding Yards	English Units		
National Steel & Shipbuilding Co. Harbor Drive & 28th St. San Diego, CA 92186-5278	210 X 27 SW (2) 274 X 34 SW 299 X 52 GD 229 X 42 FD	305 2210	1/ Construction, conversion, and repairs - all types of vessels. 2/ 3,931 Graving dock and piers at U.S. Naval Station also leased, as required.
	690 X 90 SW (2) 900 X 110 SW 980 X 170 GD 750 X 137 FD	1000 7250	
Portland Ship Repair Yard 5555 N. Channel Avenue Building 50 Portland, OR 97217 Facilities also leased by: 1. Cascade General, Inc. 2. Northwest Marine, Inc. 3. West State, Inc.	145 X 30 LL 247 X 33 LL 198 X 26 FD 247 X 33 FD 351 X 55 FD	335 3231	1/ Ship construction, repair and conversion - all types of vessels. 2/ 3,135 * * Includes employees of lessors.
	475 X 100 LL 810 X 108 LL 650 X 84 FD 810 X 108 FD 1150 X 181 FD	1100 10600	
Tacoma Boatbuilding Co. 1840 Marine View Drive Tacoma, WA 98422	(2) 130 X 14 SW * (2) 131 X 15 SW *	212 419	1/ Shipconstruction, repairs, and conversion - all types of vessels. 2/ 88 * Vessel with beam up to 30 meters (98 ft.) can be constructed by joining the two shipways.
	(2) 425 X 45 SW * (2) 430 X 50 SW *	695 1375	

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WEST COAST	Metric Units		
Shipbuilding Yards	English Units		
Todd Pacific Shipyards Corp. Seattle Division 1801-16th Avenue, S.W. Seattle, WA 98124	(2) 168 X 18 SW * 128 X 19 FD 198 X 26 FD 287 X 41 FD	427 1834	1/ Ship construction, repairs, and conversion - all types of vessels. 2/ 1.278 * Max. ship size is 168 X 29 meters (550 ft X 96 ft) using two 168 X 18 meter SWs (550 ft X 60 ft).
	(2) 550 X 60 SW * 420 X 62 FD 650 X 84 FD 943 X 133 FD	1400 6017	

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WEST COAST	Metric Units		
Repair Yards with Drydock Facilities	English Units		
AK-WA, Inc. 401 Alexander Avenue Building 588 Tacoma, WA 98421	162 X 24 FD	198 533	1/ Ship repair and conversion. 2/ 233
	530 X 80 FD	650 1750	
Maritime Contractors, Inc. 201 Harris Avenue Bellingham, WA 98225	122 X 18 FD	396 777	1/ General ship repair. 2/ 110
	400 X 60 FD	1300 2550	
Southern Oregon Marine, Inc. 1746 Coos River Hwy Coos Bay, OR 97420	122 X 30 MR	122 122	1/ General ship repair and barge construction. 2/ 114
	400 X 100 MR	400 400	
Southwest Marine, Inc. P.O. Box 13308 Foot of Sampson Street San Diego, CA 92170-0308	200 X 31 FD 127 X 19 FD	213 589	1/ Ship repairs, overhaul, and conversion. 2/ 1,273 Graving dock at Naval Station can be leased as required.
	655 X 102 FD 418 X 62 FD	700 1932	

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WEST COAST	Metric Units		
Repair Yards with Drydock Facilities	English Units		
Southwest Marine, Inc. San Pedro Division 985 So. Seaside Avenue Terminal Island, CA 90731-7331	219 X 28 FD 128 X 16 FD 213 X 29 FD	547 1116	1/ Ship repairs, overhaul, and conversion. 2/ 313
	720 X 93 FD 420 X 54 FD 700 X 96 FD	1796 3661	
Southwest Marine Inc. San Francisco Division Foot of 20th Street San Francisco, CA 94120-7644	290 X 44 FD 213 X 29 FD	244 1149	1/ Ship repairs and overhaul. 2/ 373
	950 X 144 FD 700 X 94 FD	800 3770	
United Marine Shipbuilding, Inc. 1441 N. Northlake Way N. Seattle, WA 98103	122 X 17 FD	61 61	1/ General ship repairs. 2/ 67
	400 X 57 FD	200 200	

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WEST COAST	Metric Units		
Topside Repair Yards	English Units		
Al Larson Boat Shop 1046 S. Seaside Aveue Terminal Island, CA 90731		107 168 350 550	1/ Ship and boat repair. 2/ 100
Billfish, Inc. Berth 44, Outer Harbor San Pedro, CA 90731		189 189 620 620	1/ General ship repair. 2/ 92
Campbell Industries P.O. Box 1870 501 E. Harbor Drive San Diego, CA 92112		195 666 640 2185	1/ General ship repair and construction of vessels up to 91 meters (300 ft.) in length. 2/ 400
Commercial Marine Service, Inc. 258 Cannery Street Terminal Island, CA 90731		128 256 420 840	1/ General ship repair. 2/ 12

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WEST COAST	Metric Units		
Topside Repair Yards	English Units		
Continental Maritime of San Diego, Inc. 1995 Bay Front Street San Diego, CA 92113-2122		213 663 700 2175	1/ General ship repair. 2/ 523
Foss Shipyard 660 West Ewing Street Seattle, WA 98119		140 788 460 2585	1/ Vessel repair, alteration, and overhaul. 2/ 144
Lake Union Drydock Co. 1515 Fairview Avenue East Seattle, WA 98102		305 1291 1000 4235	1/ Ship repair and conversion. 2/ 174
Pacific Fishermen, Inc. 5351 24th Avenue, N.W. Seattle, WA 98107		152 396 500 1300	1/ Construction and repair of small vessels. Topside repair of large vessels. 2/ 45

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WEST COAST	Metric Units		
Topside Repair Yards	English Units		
Service Engineering Co. P.O. Box 7714 San Francisco, CA 94120		244 808	1/ General ship repair and conversion. 2/ 252
		800 2650	

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GREAT LAKES

(Maximum ship size that can exit the St. Lawrence Seaway locks is 222 meters X 24 meters (730 ft. X 78 ft.))

Shipbuilding Yards	Metric Units / English Units		
Erie Marine Enterprises Inc. Div. of Jonathan Corp. Foot of Holland Street P.O. Box 1730 Erie, PA 16507-0730	375 X 35 GD 1231 X 116 GD	381 / 859 1250 / 2820	1/ Ship construction, repair, and and conversion. 2/ 27
Fraser Shipyards, Inc. P.O. Box 997 Superior, WI 54880	251 X 25 GD 189 X 198 GD 825 X 82 GD 620 X 61 GD	274 / 1356 900 / 4450	1/ Ship construction, repairs, and conversion. 2/ 160
Marinette Marine Corp. Foot of Ely Street Marinette, WI 54143	122 X 20 SW 400 X 65 SW	651 / 651 2136 / 2136	1/ Ship construction, repair, and conversion. 2/ 218
Merce Industries, Inc. 3135 Front Street Toledo, OH 43605	165 X 21 GD 250 X 24 GD 540 X 68 GD 820 X 78 GD	244 / 491 800 / 1610	1/ Ship construction, repair, and conversion. 2/ 60

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GREAT LAKES

(Maximum ship size that can exit the St. Lawrence Seaway locks is 222 meters X 24 meters (730 ft. X 78 ft.))

Shipbuilding Yards	Metric Units English Units		
Peterson Builders, Inc. 101 Pennsylvania St. P.O. Box 650 Sturgeon Bay, WI 54235-0650	125 X 21 SW	274 767	1/ Ship construction, repair, and conversion. 2/ 990
	410 X 68 SW	900 2515	

GREAT LAKES

(Maximum ship size that can exit the St. Lawrence Seaway locks is 222 meters X 24 meters (730 ft. X 78 ft.))

Repair Yards with Drydock Facilities	Metric Units English Units		
Bay Shipbuilding Corp. 605 North Third Ave. Sturgeon Bay, WI 54235	195 X 20 FD 351 X 41 GD 222 X 32 SW	305 2162	1/ Ship construction, repairs, and conversion. 2/ 479
	640 X 66 FD 1150 X 136 GD 730 X 105 SW	1000 7095	

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GREAT LAKES			
(Maximum ship size that can exit the St. Lawrence Seaway locks is 222 meters x 24 meters (730 ft X 78 ft.))			
Topside Repair Yards	Metric Units English Units		
H. Hanson Industries dba Riverside Marine Industries, Inc. 2824 Summit Street Toledo, OH 43611		226 451 740 1480	1/ General ship repair. 2/ 48
Nicholson Terminal & Dock Company P.O. Box 18066 River Rouge, MI 48218		701 1097 2300 3600	1/ General ship repair. 2/ 120

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NON-CONUS **Shipbuilding Yards**	Metric Units / English Units		
NONE			
NON-CONUS **Repair Yards with Drydock Facilities**			
Ketchikan Shipyard, Inc. P.O. Box 5380 3801 Tongass Avenue Ketchikan, AK 99907	137 X 31 FD	305 / 305	1/ General ship repair. 2/ 30
	450 X 103 FD	1000 / 1000	
Marisco, Ltd. 607 Ala Moana Blvd. Honolulu, HI 96813	152 X 24 FD	*	1/ General ship repair. 2/ 100 * Leased from Port Commission.
	500 X 78 FD	*	
Puerto Rico Drydock & Marine Terminals P.O. Box 2209 San Juan, PR 00903	193 X 30 GD	305 / 1006	1/ General ship repairs. 2/ 103
	632 X 97 GD	1000 / 3300	

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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-1991
NON-CONUS	Metric Units		
Topside Repair Yards	English Unit		
Honolulu Shipyard, Inc. P.O. Box 30989 Honolulu, HI 96820		183 183	1/ General ship repair and overhaul. 2/ 171
		600 600	