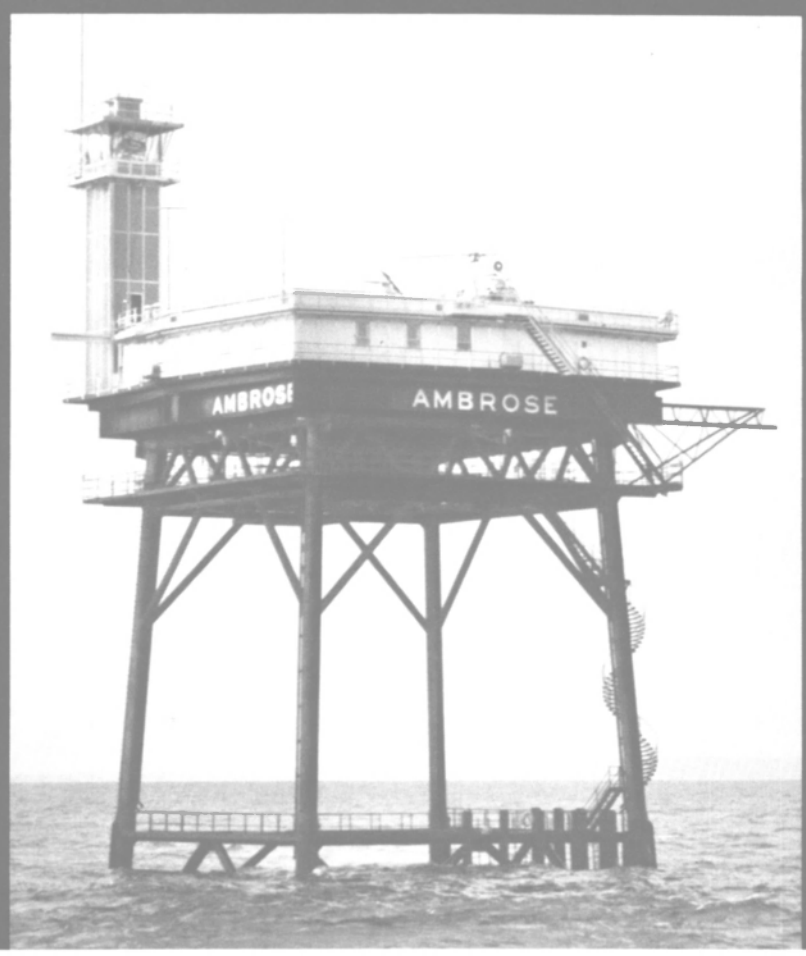
MARITIME REPORTER
AND
ENGINEERING NEWS

Special
SHALLOW-DRAFT REVIEW

Shallow-Draft Vessel Review
(SEE PAGE 14)

JANUARY 1, 1981

When you pass The Ambrose Light, you're not far from Gulf.



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Write **199** on Reader Service Card

Zelvin Levine Appointed Advanced Ship Operations Director At MarAd

Samuel B. Nemirow, Assistant Secretary of Commerce for Maritime Affairs, has appointed Dr. **Zelvin Levine** to the post of Director, Office of Advanced Ship Operations, one of three offices reporting to the Assistant Administrator for Research and Development.

In this new position, Mr. **Levine** is responsible for the Maritime Administration's (MarAd's) research and development programs in the areas of ship operations, including fleet management technology, ship performance and safety, and cargo-handling research. He also is responsible for the agency's National Maritime Research Center located at Kings Point, N.Y. One of the center's principal programs involves its Computer Aided Operations Research Facility (CAORF), which is the world's most advanced, computer-generated, visual display simulator devoted to ship operations research.

Mr. **Levine** has held senior management positions since joining the Maritime Administration. He has headed MarAd's Office of Advanced Ship Development (1975-80) and the Office of Maritime Technology (1972-75). He joined the agency in 1969 as program manager for advanced ship propulsion systems research and development after 14 years in the private sector.

B&W Yard Gets Contract For Tenth Bulk Carrier

Burmeister & Wain Shipyard, Copenhagen, has signed a contract with Newark Shipping Company Limited, Monrovia, Liberia, for the delivery of a 64,000-dwt bulk carrier of the fuel-saving type in the middle of 1982.

Since December 1979 the B&W yard has signed contracts for the delivery of no less than 10 ships of the above mentioned type, which is characterized by a low fuel consumption of less than 40 tons per day at an average speed of 15 knots.

With this contract the shipyard has secured work for the employees until first quarter of 1983. The B&W yard is optimistic in obtaining further orders.

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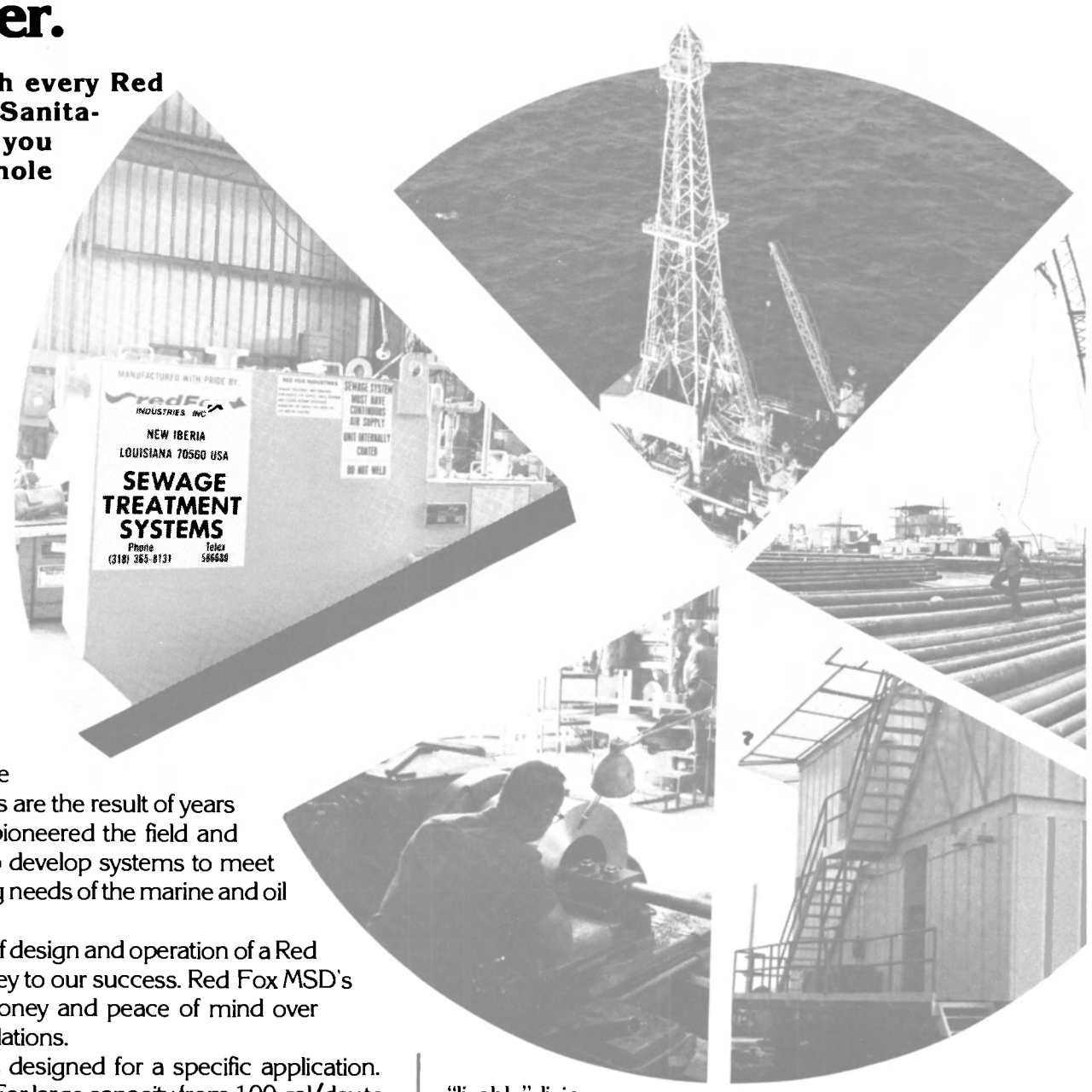

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Write 112 on Reader Service Card

$8.6-Million Contract For Frigate Overhaul Awarded By Navy To BIW

A contract for approximately $8.6 million to overhaul the frigate USS Brumby (FF-1044) was awarded by the U.S. Navy recently to Bath Iron Works, marking the second ship of the class slated for the shipyard within a month. A like contract for approximately $9 million for its sister ship, USS Edward McDonnell (FF-1043), was awarded to the company in October. Both frigates were commissioned into the Navy in 1965, and both are scheduled to arrive at the Bath, Maine, yard in February 1981 for 10-month overhauls.

"We won both contracts against intense competition in an extremely depressed shipbuilding industry," said BIW president **John F. Sullivan Jr.** "They reflect our aggressive marketing, which in turn reflects our total confidence in the ability of our management and shipbuilders to meet the most demanding budgets and schedules."

Mr. **Sullivan** said the dual overhauls will require about 800 workers at their peak. The newest award raises the value of contracts won by Bath Iron Works since September to approximately $64.7 million.

Gould Gets $4.4-Million Navy Contract For Navigational Sets

Gould, Inc., NAVCOM Systems Division, El Monte, Calif., has been awarded a $4,439,369 modification to a previously awarded letter contract for 43 AN/URN-25 TACAN navigational sets. The Naval Electronic Systems Command is the contracting activity. (N00039-80-C-0436)

Phillips Appointed Gulf Coast General Manager For Designers & Planners

Edwin F. Phillips

The Galveston Office of Designers & Planners, Inc. has been redesignated as the Gulf Coast Office, and has been relocated in Dickinson, Texas, midway between Galveston and Houston. **Monroe Levy**, vice president and manager of the Galveston Office, retired from D&P on December 31, 1980. However, he will continue as a principal owner and director of the corporation, and will remain on the staff as a consultant to the firm.

Edwin F. Phillips has been appointed as the Gulf Coast general manager. In his new capacity Mr. **Phillips** will report to the executive vice president **Wolfgang Reuter**, and will manage D&P's activities in the Gulf Coast Area. The announcement was made recently by **Ferd Serim**, president of the company. Designers & Planners is a firm of naval architects and marine engineers with offices in New York, Washington, and Dickinson, Texas.

Mr. **Phillips** joined D&P in 1959 and held various positions with the company both in New York and Galveston, including the position of chief naval architect of the Galveston Office since 1969. Prior to joining D&P, he was employed by Marine Computer Applications Corporation, Grumman Aircraft/Engineering Corporation, and the Shipbuilding Division of Bethlehem Steel Corporation.

The new address of the Gulf Coast Office is Designers & Planners, Inc., P.O. Box 1144, Dickinson, Texas 77539; telephone (713) 337-6141.

James H. Cottrell Joins Ogden Corporation As Vice President

James H. Cottrell has been named vice president of Ogden Corporation, it was announced by **Ralph E. Ablon**, chairman and chief executive officer. Mr. **Cottrell** joins Ogden from the Lummus Company.

James H. Cottrell

He will direct Ogden's expansion into equipment for process and energy-related plants. Emphasis will be placed upon utilization and expansion of fabrication capabilities at Avondale Shipyards and Yuba Heat Transfer. State-of-the-art techniques will be offered for fabrication of engineered process equipment, pipe spools, and plant modules.

In addition, Mr. **Cottrell** will coordinate Ogden's activities in coal transportation, where the skillls of several divisions are available for the manufacture of specialized railroad cars for coal transportation, handling of coal at ocean ports, and construction and operations of ships for coal movement.

Mr. **Cottrell's** industrial career commenced with Cities Service in 1958 on work associated with the Athabasca Tar Sands of Northern Alberta, Canada, and it includes over 15 years with C.F. Braun & Co. in various capacities to vice president, and Science Management Corporation as executive vice president.

Guralnick Associates Awarded Design Contract By MSC-Pacific

Morris Guralnick Associates, Inc. (MGA) has just been awarded a level-of-effort design contract by the Military Sealift Command, Pacific (MSCPAC), under which the San Francisco firm of naval architects and marine engineers will be called on to assist in design and engineering work associated with MSCPAC operations during the coming year.

In making the announcement of the new contract award, **Hugh F. Munroe**, president and chief executive officer of MGA, said: "In the past, occasional design tasks were issued by MSCPAC to design contractors only when an urgent need arose, and we have at times been engaged by MSC-PAC to supplement its ship design staff. Recently, however, conditions have developed in which more formal and continuing assistance is required by MSCPAC, resulting in solicitation and award of the type of contract just awarded to our firm. Under this contract, we will provide on-demand services to MSCPAC throughout the year."

The Military Sealift Command, Pacific, headquartered in Oakland, Calif., is the shipping arm of the Department of Defense, operating many classes of ships, including dry and bulk cargo types. In addition, MSCPAC operates support ships (underway replenishment and scientific) for the United States Navy and other customers. The maintenance of these vessels requires frequent modification to conform to changing conditions, and MGA will provide design and engineering assistance as required.

Morris Guralnick Associates, largest naval architectural and engineering firm of its type on the Pacific Coast, was founded in San Francisco 34 years ago. Presently engaged in several long-term projects for the maritime industry, the U.S. Navy, and other commercial and government clients, the organization in addition to its headquarters office in San Francisco operates a branch office in San Diego.

Combination Gas Tanker 'Hektor' Delivered By Moss Verft

The Moss, Norway, yard of Moss Rosenberg Verft A/S, a member of the Kvaerner Group, recently delivered the liquefied petroleum gas/chemical tanker Hektor to A/S Nordsjogas of Stavanger, Norway. The ship has a total cargo capacity of 24,000 cubic meters divided in three tanks. These are designed for carrying propane, butane, ammonia, vinyl chloride (VCM) as well as mixtures of propane and butane. Two types of cargo can be carried simultaneously.

Hektor is built according to Det norske Veritas class +1A1, Ice C, EO, Tanker for Liquefied Gas. She is constructed in accordance with U.S. Coast Guard Rules and Regulations for Foreign-Flag Vessels, and also complies with IMCO Gas Code Regulation A 328 IX. The ship has an overall length of 157.80 meters, beam of 24.40 meters, and depth of 16.00 meters (517.7 by 80 by 52.5 feet). At maximum draft of 10.70 meters (35.1 feet), she has a deadweight of 20,000 tons; gross tonnage is 15,819.

The ship is built with a single deck and without forecastle and poop. All accommodations and the engine room are arranged aft. Seven watertight bulkheads subdivide the ship, which is built with double bottom and single shell. The shell, main deck, and inner bottom in the cargo area are fabricated of steel meeting the requirements of a secondary barrier for cargo containment.

Hektor has three independent, self-supporting cargo tanks of prismatic shape. They are designed for carrying fully cooled LPG, NH_3, and VCM operating with a slight overpressure; lowest permissible temperature is minus 48 C. The tanks are built as a welded structure of plates of low-temperature steel, and insulated on the outside with polyurethane.

All pipe connections to the cargo tanks are connected to the tank dome. Discharging is carried out in about 10 hours by six deepwell pumps, two in each tank. Crossovers connect the ship's loading/discharge lines with loading arm on shore. Boil-off from the cargo is fed to the onboard reliquefaction plant, which consists of three two-stage units that reliquefy the gas and return it to the cargo tanks.

Versatile LPG/NH_3/VCM tanker **Hektor**, completed recently by Moss Verft for A/S Nordsjogas, Stavanger, Norway, is powered by 14,400-bhp Horton/Sulzer diesel.

Main propulsion is by a Horton/Sulzer 6RND76M diesel with maximum continuous rating of 14,400 bhp at 122 rpm. Trial speed was 17.5 knots at a draft of 9.2 meters (about 30.2 feet). Two side thrusters are installed, one forward and one aft.

The ship is equipped with a gas detector and an inert gas plant; both are of Moss design and were fabricated by Moss Verft. Navigation equipment includes two radars, Decca Navigator, radio direction finder, gyrocompass system, autopilot, echosounder, and magnetic compasses.

Diesel Shipbuilding Delivers Steel Harbor Tug To Ecuador

Diesel Shipbuilding Company of Jacksonville, Fla., recently delivered a 46-foot tugboat to the Port Authority of La Libertad, Ecuador. The main engines for the twin-screw La Libertad were supplied by Coastal Power Products of Jacksonville. They are a pair of General Motors Detroit Diesel engines, each with a continuous rating of 230 bhp at 1,800 rpm, with 32-volt starting and 60-amp, 32-volt alternators on each engine. Reduction gear ratio is 4.5:1. The propellers are Ellis 4-blade bronze, 48 by 36 inches, and the propeller shafts are 4½-inch PH stainless steel furnished by Western Branch Metals. Fuel capacity is 1,750 gallons.

The new tug is of steel construction with a 15-foot beam and draft of 6 feet. Hull construction is 5/16-inch plate and the deck is ¼-inch. There are five transverse bulkheads of ¼-inch plate, and one longitudinal of ¼-inch.

James W. Coppedge, president of Diesel Shipbuilding, said, "We have specialized in the construction of steel vessels, building a variety of shrimp boats and other workboats to meet the need for rugged, seaworthy boats. Our steel vessels have met that need for three generations."

The pilothouse has a Wagner model N400-1500, hydraulically operated steering system with a 42-inch mahogany wheel, Perko navigation lights with screens, and One Mile Ray searchlight. Quarters in La Libertad are of the day type, with settee cushions in the aft end of the wheelhouse, and two pipe berths.

Diesel Shipbuilding of Jacksonville has delivered the tugboat **La Libertad** to the Port Authority of La Libertad, Ecuador. Boat is powered by two Detroit diesels.

Talking Navigator Option From Texas Instruments —Literature Available

Texas Instruments Incorporated has just introduced a TI 9930 Talking Navigator Accessory Option with Autopilot Output for use with its Loran C based navigation system.

Using the new Speech Option, the commercial boat operator situated anywhere on the vessel where there is a speaker can receive Loran C-based information. Data is also available on call by pressing an appropriate key on the TI 9900 keyboard. Other messages include power-up status, system warnings, and entry corrections.

Another in a growing line of TI products utilizing Solid State Speech™ chips, the TI 9930 may be added to the TI 9900 fully automatic Loran C Navigator. A state-of-the-art device introduced a little over a year ago, the TI 9900 packs a complete navigation system into a unit the size of a large city telephone book.

Easily added to any TI 9900 or TI 9900N, the new Speech Option provides multiple remote reporting capabilities at low cost. The clear, crisp "voice" of the new unit can be heard anywhere a user chooses to mount a loudspeaker — in a pilothouse, below decks, on deck, or in the cockpit.

The unit can report eight basic navigational announcements: time (24-hour clock), position (latitude/longitude), speed over the bottom (knots), range to waypoint (nautical miles), time to go at present speed to next waypoint (hours-minutes-seconds), cross track error (miles off course), course made good (degrees true or magnetic), and bearing to next waypoint (degrees).

An operator can select up to four of the messages at a time, in any order, to repeat at any interval between six seconds and one hour. He can also utilize the normal visual display.

The TI 9930 will be shown publicly for the first time at the New York National Boat Show, beginning January 15, 1981.

For more information on the new Talking Navigator Option, Write 37 on Reader Service Card

$7-Million Navy Contract For Engineering Services Awarded To Newport News

Newport News Shipbuilding, Newport News, Va., has been awarded a $6,969,382 cost-plus-fixed-fee contract for engineering and technology services in the conduct of SSN-688 Class planning yard functions and engineering services for operational SSN/SSBN submarines. The Naval Sea Systems Command is the contracting activity. (N00024-81-C-2010)

J.G. German Appointed President And CEO Of German & Milne

German & Milne Inc., naval architects of Montreal, has announced the appointment of **John Gordon German** as president and chief executive officer. Mr. **German** is a graduate of the Massachusetts Institute of Technology and the University of Michigan, and has pursued a successful career in the field of ship design and marine transportation consultancy. He has many unusual and successful designs to his credit, and is currently engaged in special projects related to Arctic navigation.

$11.8-Million Support Services Contract Awarded To CACI-Federal

CACI, Inc.-Federal, Arlington, Va., has been awarded a $11,840,-226 modification to a previously awarded contract for services in support of the Saudi Naval Expansion Program. The Naval Regional Contracting Office, Washington, D.C., was the contracting activity. (N00600-79-C-0206)

At-Sea Navigation Seeks Title XI On Two Tug/Barge Units To Cost $54 Million

At-Sea Navigation, Inc., 534 East Putnum Avenue, Greenwich, Conn., has applied to the Maritime Administration for a Title XI guarantee to aid in financing the construction of two ocean-going tug-barge units for transportation and incineration of chemical wastes off the Eastern Coast of the United States.

The 3,360-bhp diesel tugs would be 295 gross tons each, and the barges 7,000 gross tons each. A builder has not yet been proposed, but the applicant has indicated it would seek delivery in March 1983.

If approved, the Title XI guarantee would cover $47,435,500, or up to 87½ percent of the total estimated cost of $54,212,000 for the two tug/barge units.

ASNE Puget Sound Section Meets Aboard Ferry 'Issaquah'

A guided tour of the pilothouses, engine rooms and engine control room of the new ferry M/V Issaquah while underway highlighted the recent meeting of the Puget Sound Section of the American Society of Naval Engineers. The combined dinner and technical meeting was hosted by the Washington State Ferry System, and was held as the ferry traveled between Fauntleroy and Southworth.

Dinner was followed by an interesting presentation by **Jim Solund**, project manager for construction. The presentation on the many engineering aspects of the ferry was followed by a brisk question and answer period. Capt. **R.C. Melberg**, maintenance director, provided excellent responses to the questions.

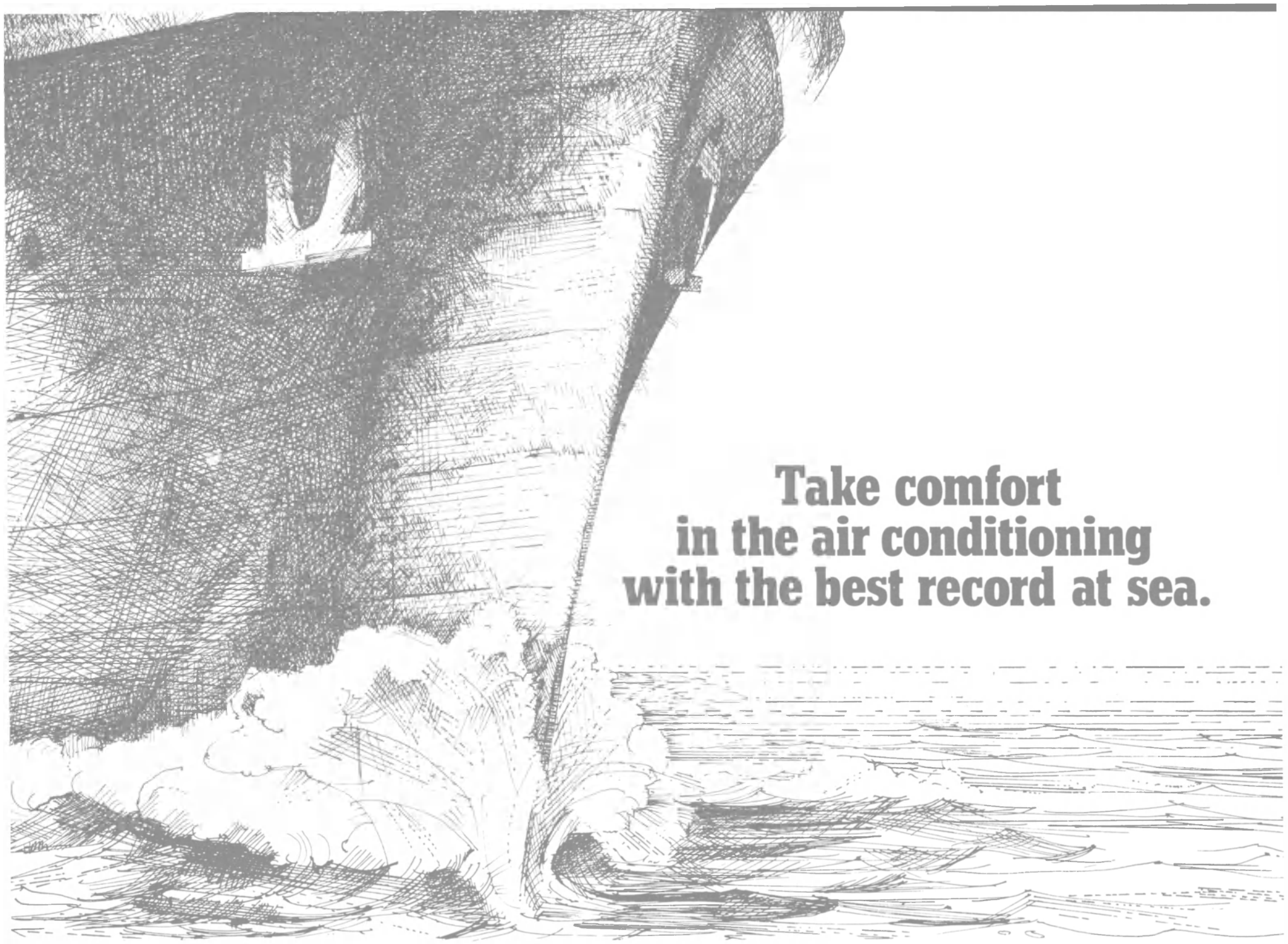
New Service Station For Propellers Added At Curacao Drydock Yard

The Curacao Drydock Company, Inc. of Willemstad, Curacao, Netherlands Antilles, recently opened a propeller service station that can accommodate propellers of nearly any type and size. The station came about by an agreement with Lips B.V. of Holland whereby several Curacao Drydock engineers, technicians, and welding specialists underwent an extensive theoretical and practical training course for the surveying, modifying, repairing, and general servicing of propellers. Extensive machinery was installed and special tools and materials were purchased in order to be able to offer the yard's clients another complete and efficient service.

Propellers need not belong to vessels that dock at Curacao Drydock for surveys and repairs. Interestingly, several shipowners have already sent loose damaged propellers to the yard and, once repaired, had them collected and stored onboard as the spare. Opened only for a few months, the propeller service station has repaired a considerable number of propellers, thus complementing the many repair services already offered by the Curacao Drydock.

Earlier in 1980, Curacao Drydock also concluded a service station agreement with the maker of S.E.M.T. Pielstick engines. Again, engineers and technicians attended training courses in France to acquire the specialized know-how to overhaul and repair these engines.

These repair services were thus started and added to the existing ones at Curacao Drydock, which include other major manufacturers of marine propulsion machinery, notably Burmeister & Wain, Gotaverken, M.A.N., Stork-Werkspoor Diesel, and Sulzer, among others, and the makers of specialized equipment and suppliers of services such as Simplex stern tube seals, Ascargo and MacGregor hatch covers, Chockfast epoxy chocking systems, Nicol & Andrew in situ machining, honing, and grinding, and Metalock repairs.



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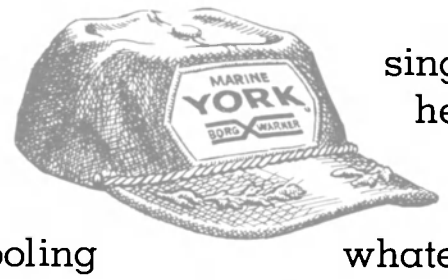

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McDermott International Buys Pipelaying Barge For $85 Million

McDermott Incorporated has announced that its wholly owned subsidiary, McDermott International, Inc., has purchased the semisubmersible pipelaying barge Viking Piper from Viking Jersey Equipment Limited, a 75-percent-owned affiliate of Santa Fe International Corporation, for the sum of $85 million.

The barge, with a gross weight of 19,968 tons and a displacement of 50,410 tons, will be redesignated the McDermott Lay Barge 200, and be based in the North Sea area. The company plans to employ it there and in other regions where weather conditions require a semisubmersible operation. Acquisition of this modern vessel allows McDermott to offer its customers increased capability for pipelaying operations on a worldwide basis, according to **J.E. Cunningham**, chairman of the board and chief executive officer.

The LB-200, with accommodations for a crew of 500, is a stern ramp lay barge capable of laying pipe with up to a 60-inch outside diameter at depths of up to 2,000 feet. It is 550 feet long, 192 feet wide, and 109 feet high. It has a line station feed with 10 stations, six of which are welding stations, and two pipe tensioners with a combined tensioning strength of 300,000 pounds and capable of feeding pipe at a rate of 100 feet per minute. The barge is also equipped with a saturation diving system, which operates at depths of up to 1,000 feet.

$5.9-Million Contract For Navy Overhaul Awarded To Southwest Marine

Southwest Marine Incorporated, San Diego, Calif., is being awarded a $5,878,000 formally advertised firm fixed price contract for the regularly scheduled overhaul of the tank landing ship Bristol County (LST-1198). The Supervisor of Shipbuilding, Conversion and Repair, USN, San Diego, Calif., was the contracting activity. (N62791-77-C-0001)

OPS Forms New Marine Design Services Division Roy Thomas Named Director

Offshore Power Systems (OPS), located in Jacksonville, Fla., has recently formed a marine design services division. A staff of over 100 engineering/design personnel complemented by a Computer-Aided-Design and Drafting System, a fully equipped and professionally staffed model shop, and a modern testing laboratory are available to serve the marine industry.

Offshore Power Systems, a Westinghouse enterprise, was originally formed as a joint venture between Westinghouse and Tenneco (Newport News Shipbuilding) with total responsibility for the engineering, design, analysis, licensing and manufacture of Floating Nuclear Plants. OPS is currently providing design services for two major shipyards.

Roy Thomas will be director of the Marine Design Division, and **Clinton Dotson** will be chief engineer of naval architecture and marine engineering. Mr. **Thomas** will be responsible for organizing and directing all marine design and engineering services provided to the maritime industries. He has over 20 years' experience in the marine field in design, engineering, supervision, project management and administration. Mr. **Thomas** spent 15 years at Newport News Shipbuilding prior to joining OPS as chief engineer, design.

Mr. **Dotson** will be responsible for all engineering work on marine design projects. He began his 25-year career in the marine industry as an apprentice in the Newport News Shipbuilding Apprentice School. He gained extensive experience in the design and analysis of both Navy and commercial vessels during his 19 years of employment at Newport News Shipbuilding, and held the position of engineering section manager in the Hull Technical Department prior to joining OPS in 1972 as manager, naval architecture.

Skaer Appointed Vice President-Marketing For Wall Industries

D. Philip Skaer II has been named vice president of marketing by Wall Industries, Inc., Beverly, N.J., manufacturers of diverse rope constructions for marine, industrial, hardware, utility, and fishing markets. He was formerly vice president and general manager of Tubbs Cordage Company's Jackson Rope Division. Prior to that, he was sales manager of the Broderick and Bascom Rope Company in St. Louis.

Wall also named **Russell Masson**, Jacksonville, Fla., as sales representative covering the Southeastern United States. He was formerly with the Cordage Group for 27 years.

Wall Industries, Inc. is the parent company of Yale Cordage, Inc., Yarmouth, Maine; Wall Rope Works; and the New Bedford Cordage Company, Beverly, N.J. The company is currently celebrating its 150th anniversary as a major rope manufacturer.

Title XI Approval For Schmidt's Tank Barge To Cost $1.68 Million

Assistant Secretary of Commerce for Maritime Affairs, Maritime Administration, **Samuel B. Nemirow** has approved in principle an application by O.L. Schmidt Barge Lines, Inc., for a Title XI guarantee to aid in financing the construction of a double-skinned tank barge.

The vessel, which was scheduled for delivery by the end of 1980, will have an overall length of 275 feet and a molded beam of 54 feet. It is expected to operate in the cartage of residential fuel in the Lake Michigan area, mostly between Chicago, and East Chicago, Ind. Port of Brownsville Shipyard, Inc., Brownsville, Texas, is the builder.

Title XI financing will cover $1,470,000, or 87½ percent of the estimated cost of $1,680,000.

Electric Boat Gets Two Navy Contracts Totaling $16.5 Million

General Dynamics' Electric Boat Division, Groton, Conn., has been awarded an $11,000,000 cost-plus-fixed-fee contract for SSBN (fleet ballistic missile submarine) planning yard support. The Naval Sea Systems Command is the contracting activity. (N000 24-81-C-2004)

Electric Boat also was awarded a $5,460,-000 cost-plus-fixed-fee contract for SSN (attack submarine) planning yard support. The Naval Sea Systems Command is the contracting activity. (N00024-81-C-2005)

A Review

OUTSTANDING U.S. SHALLOW-DRAFT VESSELS OF 1980

The shallow-draft sector of the U.S. shipbuilding industry continues its pattern of steady growth, especially in the offshore sector. Construction of utility boats, supply vessels, crewboats, and other types to service the offshore drilling and production platforms, as well as tugs and towboats for use on the inland waterways, is providing substantial and profitable work for most of the smaller yards.

This article—our First Annual Review of Shallow-Draft Vessels —is a portfolio of some of the outstanding craft that have been completed by U.S. shipyards during the past year.

CRABBER/TRAWLER 'BIRGIT-N'

The fishing vessel Birgit-N, first crabber/trawler built by Tacoma Boatbuilding for Bering Sea service, was delivered to **Peter Njardvik** and **A.O. Nordheim** to join their other vessels in the rigorous and highly competitive Bering Sea crab fishing. The vessel's design, by B.F. Jensen and Associates, incorporates several features that improve the efficiency of the trawler.

The new boat has an overall length of 123 feet, beam of 32 feet, and depth to main deck of 16 feet. Propulsion is by a Caterpillar D399 diesel with an output of 1,125 bhp at 1,225 rpm, providing a speed of 12 knots through 4.5:1 reduction gearing. The engine is controlled by Mathers Controls equipment. Electric power is provided by three Caterpillar generators—two model 3406 each of 210 kw and one model 3304 of 90 kw. The hydraulic system is by Vickers.

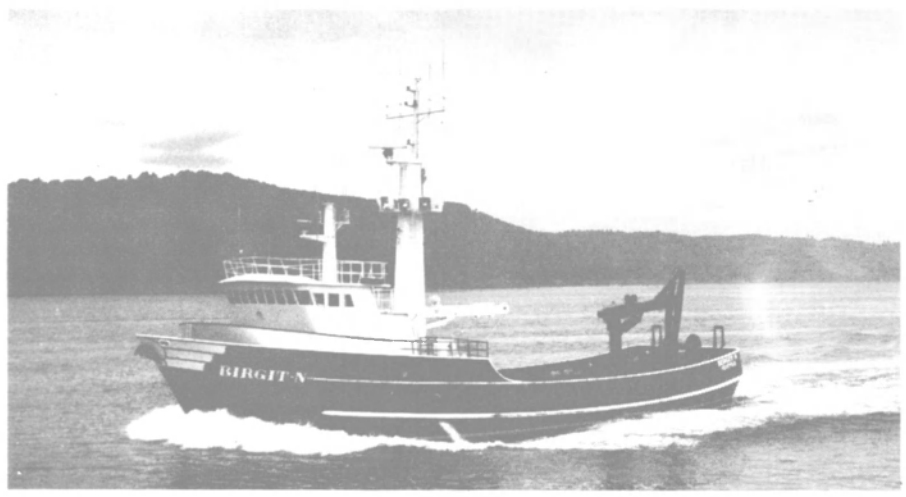
The Birgit-N has four crab tanks with a total capacity of 8,800 cubic feet, each tank being insulated with 6 inches of closed-cell urethane foam. This four-tank arrangement allows for ease of loading crab, and also facilitates handling of salmon when the vessel operates as a tender during the Alaskan salmon season.

A 60-ton York refrigeration plant is installed to maintain fish in the tanks at a temperature of 30 F in chilled seawater. Sumps located in the forward tanks and a sliding watertight door between tanks will allow rapid discharge of the frozen salmon via a fish elevator through the forward tank hatches.

A major benefit of the four-tank arrangement is a shaft alley allowing access from the engine room to the steering compartment and lazarette below decks. The circulation pumps are located in the shaft alley, thus leaving more usable space in the engine room. All compartments below the deck are protected by watertight doors.

The efficiency of Birgit-N's design is enhanced by the use of two 10-ton cranes both supplied by Northern Line Machine, a division of Tacoma Boat. The forward crane has a reach of 36 feet, and will serve as the picking boom. The aft crane is a unique level-luffing design with a reach of 48 feet. The level-luffing feature of this crane allows the operator to raise and extend the boom without the need to constantly pay out or haul in line. No matter how the boom is manipulated, the line length remains fixed. This arrangement is said to be safer, faster, and more precise than existing installations. Both cranes are controlled by hydraulic servos on the main control valves that are located in the engine room.

The boat is also equipped with a pair of trawl winches, a stern ramp, and a Northern Line net reel to allow the Birgit-N to trawl for bait fish.



Birgit-N

TOWBOAT 'BOONE'

Boone

Dravo SteelShip Corporation, Pine Bluff, Ark., recently delivered the towboat Boone to Cincinnati Gas and Electric Company for use at its East Bend Station, a coal and lime facility located on the Ohio River near Rabbit Hash, Ky.

The Boone has a length of 60 feet, beam of 22 feet, and depth of 7.5 feet, and is powered by twin Caterpillar 3412 marine diesels developing a total of 900 bhp at 1,800 rpm. The engines are cooled by Fernstrum grid coolers. Caterpillar 3316, 45-kw, electric-start generators sets power the electrical system, which includes Beebe 33-RC deck winches, Carlisle & Finch searchlights, and other equipment.

The vessel is equipped with two 62-inch by 34-inch, four-blade bronze propellers furnished by Michigan Wheel. Two steering and four flanking rudders provide for maneuverability and speed. The heavily braced and framed hull is fabricated of ⅜-inch plate; deck plating is ¼-inch. Fuel capacity is 8,000 gallons.

SUPPLY BOAT 'CLIPPER KEY WEST'

Blount Marine Corporation of Warren, R.I. has delivered the 156-foot offshore supply vessel Clipper Key West to Hamilton, Inc. of Panama City, Fla. The vessel admeasures under 200 gross tons, and is equipped to carry up to 600 long tons of combined calcium chloride or liquid mud and deck cargo. Clear deck length inboard is 114 feet, with a clear inboard width of 30 feet 8 inches. Her four mud tanks have a total capacity of 1,800 cubic feet.

Main propulsion is provided by two General Motors Detroit Diesel Allison 16V149 diesels developing a total of 1,800 bhp at 1,800 rpm and driving Columbian Bronze stainless steel propellers. Two 99-kw generators furnish electric power. A 36-inch Murray and Tregurtha bow thruster is powered by a 210-bhp diesel. On sea trials at full draft the vessel attained a speed of 12 knots.

Steering is S.S.I. electrohydraulic with an automatic pilot. Two radars, Sitex 22 and 23, a Marconi CH100 SSB radio, Motorola Triton VHF radio, Raytheon 6000 Dual C Loran, and Data Marine depth recorders complete the pilothouse equipment.

The Clipper Key West meets U.S. Coast Guard requirements for Gulf Service, and is classed +A-1 by the American Bureau of Shipping. She joins the supply vessels Clipper Paradise Island and Clipper Cozumel built by Blount Marine Marine for the same owner.

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Clipper Key West

Write 362 on Reader Service Card ►

Shallow Draft Vessel Review

(continued from page 15)

CREW/SUPPLY VESSEL 'C/RAIDER'

C/Raider

Swiftships, Inc. of Morgan City, La., recently delivered the crew/supply boat C/Raider to CO-MAR Offshore Corporation, also of Morgan City. The vessel is the first in the CO-MAR fleet to be fitted with a ZF 2½:1 reduction gear. Her MTU engines combined with the ZF gears allow the craft to use larger propellers. This results in the vessel being able to transport heavier loads at higher speeds.

A twin-screw vessel, the C/Raider has a propulsion package consisting of two MTU 12V331 engines and ZF gears. A Delco 30-kw generator is driven by two Detroit Diesel 3-71 engines. On sea trials the boat attained speeds up to 25 knots.

Having passed U.S. Coast Guard inspection, the C/Raider is certified to carry 65 passengers, aviation fuel, and corrosives. Accommodations are provided for a five-man crew.

With a cargo deck space 58 feet by 16 feet, the vessel's cargo capacity on deck is 110 long tons; below-deck capacity is 52 tons. Loaded draft is 6 feet. The tanks hold 3,740 gallons of fresh water, 13,350 gallons of drill water, 500 gallons of drinking water, and 4,000 gallons of fuel, giving the vessel an endurance of 40 hours.

Columbian supplied the propellers, four-blade, 42-inch by 38-inch Crewboat Bronze models. Electronics were supplied and installed by Bibbins & Rice. They include a Furuno radar, two radiotelephones, a Drake TRM-1 SSB radio, Drake MRF-55 VHF radio, Texas Instruments TI-9900 automatic Loran, an Impulse 600CV depth sounder, and Danforth C654C compass.

C/Raider is equipped with lifesaving gear, and has full firefighting capabilities, and air-conditioning and heating throughout.

CEMENTING VESSEL 'HALLIBURTON 224'

Rockport Yacht & Supply Company, Inc. of Rockport, Texas, recently delivered the first of two 130-foot cementing vessels to Halliburton Services of Duncan, Okla. Named the Halliburton 224, the vessel operates out of Harvey, La., and incorporates Halliburton's latest pumping machinery and five P-tanks installed in the main deck. The vessel has an overall length of 130 feet 7 inches, beam of 33 feet, and depth of 7 feet.

Propulsion is provided by two Caterpillar D-353 diesel engines, each with continuous output of 415 bhp at 1,225 rpm. The power train includes Twin Disc MG521, 4:1 reverse/reduction gears, two four-blade propellers, and stainless steel shafts.

The specialized pumping machinery is located on the main deck forward and in a machinery space below deck. The vessel is classed by the American Bureau of Shipping A-1, AMS, Inland and Coastwise Service. The sister vessel Halliburton 225 has also joined the Halliburton fleet.

Rockport Yacht & Supply and its associate shipyard, RYSCO Shipyard, Inc. of Blountstown, Fla., are subsidiaries of Luling Oil and Gas Company of San Antonio, Texas. The RYSCO yards are builders of supply boats, utility vessels, and tugs, and are known internationally for their seaworthy shrimp boats and fishing trawlers.

Halliburton 224

PUSHER TUG 'JEANNE MARIE'

Jeanne Marie

The recently delivered Jeanne Marie is the first of three sister vessels to be built by Marine Builders of Clarksville, Ind., for Archway Fleeting and Harbor Services of St. Louis, Mo. Powered by a matched pair of Cummins KT-2300-M diesels with a combined output of 1,400 bhp at 1,800 rpm, the pusher tug is the first newly constructed boat on the nation's inland waterways powered by the KT-2300-Ms.

The tug is 70 feet long with a beam of 26 feet and draft of 5½ feet. The sturdy vessel has been designed to handle heavy traffic. Twin Disc 530 gears with a 6.06:1 reduction ratio transmit power to twin 72 by 60 inch, stainless steel Kahlenberg propellers. Two knees rising 8 feet above the deck are bolted to the ship's understructure for added strength and stability.

A Racor 800B-5 recycle blending system helps save fuel by centrifuging crankcase oil after changes and recirculating the 35 to 40 gallons into the fuel system. A pair of Cummins 40-kw, N-495-GS generator sets, one a standby unit, provide electric power for lights, winches, and radios.

The steel-hulled pushboat is being used in Archway's switching operations based at Reidy Terminal in St. Louis. To further insure against lost time due to maintenance work, a service agreement has been signed with the St. Louis Cummins marine distributor, Cummins Missouri, Inc., for parts and service requests on a priority basis.

TUGBOAT 'JEKYLL ISLE'

The 76-foot tugboat Jekyll Isle has been delivered by Gladding-Hearn Shipbuilding Corporation of Somerset, Mass., to Jekyll Towing and Marine Services Corporation of Jekyll Island, Ga. Equipped with a wide array of deck gear and electronics, the new vessel is the latest in a series of innovative tugs designed and built

'JEKYLL ISLE' SUPPLIERS

Main engines (2), 16V-92 **GM-Detroit Diesel Allison.**
Generator engines (2), **Detroit Diesel Allison.**
Reduction gears, **Twin Disc.**
Propellers (2), **Kaplan.**
Crane, **Appleton.**
A-Frame drive, **Wabco.**
Winches (2), **MARCO.**
Winch, capstan, and anchor windlass, **New England Trawler.**
Anchors (2), **Baldt.**
Tender, **Boston Whaler.**
Steering gear and wheel, **Wagner.**
Steering controls, **Mathers.**
Compasses, **Ritchie; Wagner.**
Searchlights (3) and navigation lights, **Perko.**
Electric panels, **Federal Pacific; Henschel; Simplex.**
Bilge and deck wash pumps, **Jabsco.**
Fire pump; **Gorman Rupp.**
Fendering, **Schyler.**
Heating and air conditioning, **Environmental Systems.**
Radars (2) and Loran, **Raytheon.**
Depth recorder, **Simrad.**
Sonars (2), **Wesmar.**
Digital depth sounder, **Raytheon.**
Facsimile recorder, **Furuno.**
Bridge watch, **Radar Devices Inc.**
Cordage, **Samson.**

by Gladding-Hearn during the yard's 25 years of operation.

Main propulsion power is supplied by two GM Detroit Diesel Allison 16V-92 engines with a total output of 1,200 bhp at 1,800 rpm, giving a free-running speed of 11.3 knots. At cruising speed the boat has a range of 4,000 miles, and she can operate for up to 20 days at sea without resupplying when on low-fuel operation, such as maintaining a station-holding pattern. Fuel Capacity is 13,000 gallons, and her 550-gallon water tanks can be replenished by a 150-gpd Maxim evaporator.

The Jekyll Isle is fitted with fuel-saving Kort nozzles, and she has a bollard pull of 17½ tons. The vessel has both U. S. Coast Guard and American Bureau of Shipping certification for Unrestricted Ocean Service, and meets USCG stability standards for towing, passenger service, and over-the-side crane lifts with up to 24-foot outreach.

Two Detroit Diesel 3-71 diesel generators supply 30 kw each. The electrical system is designed for non-parallel operation. Two banks of 12-volt dc batteries power electronics, emergency lighting, and auxiliary engine starting. Main engine starting and certain specialized electronics are powered by a 24-volt dc system.

Deck gear includes three winches, a knuckle-boom crane, 25-ton, pneumatic-release towing hook, and a 6-ton hydraulic A-frame. The latter lowers to the deck while the vessel is in the towing mode. An aft steering station — with controls for the A-frame, main winch, knuckle-boom crane, and hydro-winch—and a 600-watt searchlight for aft maneuvering are located on a walkway behind the pilothouse.

The vessel's electronics include a Wagner autopilot, Raytheon 1025 radar, a smaller Raytheon backup radar, Simrad EQ depth recorder with MC expander system, and Wesmar scanning sonar and Towfish sonar. Loran is a Raytheon 600 with navigational computer including latitude and

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Jekyll Isle

Shallow Draft Vessel Review —Jekyll Isle

(continued from page 17)

longitude readout. Radios are two Nautilus VHFs and one 1,000-watt SSB. For routing and operational planning she carries a Furuno facsimile weatherfax system.

The boat is designed for crew and passenger comfort as well as performance. For coastal day trips she can carry a master and up to 12 passengers. For offshore missions she has four berths located in the forecastle and two in the dinette area, providing accommodations for four crewmen and three to four guests. The vessel has central heating and air-conditioning throughout.

TOWBOAT 'JOHN M. DONNELLY'

In the shadow of the St. Louis Arch, Ingram Barge Company recently christened its new 9,000-bhp towboat, the John M. Donnelly. Designed and built by St. Louis Ship, Division of Pott Industries, the vessel features the exclusive Hydrodyne hull, and is the third towboat in the Ingram fleet built by St. Louis Ship.

The Donnelly's hull measures 200 feet by 50 feet by 11 feet 6 inches, with a normal operating draft of 8 feet 6 inches, and is designed to have an overall height of 38 feet 6 inches at design draft. The all-welded steel hull is heavily framed longitudinally and transversely, with the aft deck raised to provide additional strength to the stern.

Propulsion power is furnished by three GM Electro-Motive Division 16-645E7BA marine diesels, each developing 3,000 bhp at 900 rpm, fitted with Falk 30MRV48 vertical offset, reverse/reduction gears. The engines and gears are cooled with water circulated through a St. Louis Ship skin cooling system. The engines are started from the engine room only, and are controlled by WABCO pneumatic control equipment in the pilothouse and at each engine. Three five-bladed, stainless steel, 109-inch propellers turn in stainless steel lined Kort nozzles. In additional to the conventional engine room controls, the Donnelly is equipped with an Engine Monitor Inc. monitoring system featuring an alarm panel in the pilothouse and one in the engineer's control booth.

John M. Donnelly

Electric power is provided by two GM Detroit Diesel 150-kw diesel generator sets. A General Electric deadfront switchboard located in the soundproofed and air conditioned control booth is wired for parallel operation of the generators.

Pollution-control equipment has been installed to bring the towboat into compliance with all existing environmental protection requirements. All propulsion engine, reduction gear, and generator diesel sumps, as well as the propulsion engine's lube oil filters and coolers, can be pumped by a Viking pump to the dirty oil holding tank, or to a valved discharge connection on the main deck. Provision is also made for pumping out the dirty oil holding tank to this deck connection.

All bilge suctions are pumped via a Gorman-Rupp bilge pump to the oily water bilge collecting tank. A Hyde bilge pump draws from the oily water collecting tank and discharges to the Hyde separator, where separation and dispersal by gravity takes place. A St. Louis Ship FAST model 13-M sewage treatment plant treats the sewage from the toilet drains, and is valved to discharge the effluent overboard or to a flanged connection on the main deck.

Deck machinery consists of two Schoellhorn-Albrecht 20-hp, motor-driven double-barreled capstans, and six NABRICO 10-hp motor-driven winches. Two Sasgin boat davits, one with an Ingersoll-Rand pneumatic hoist, are located aft, port and starboard on the second deck, to handle supplies, the small workboat, and the runabout.

All living quarters, lounge, galley, messroom, engineer's control booth, and pilothouse are heated or air-conditioned, with either hot or chilled water circulated through McQuay Perfex fan coil units, with circulating water being supplied from either a Weil-McLain heating boiler or a Carrier liquid chiller unit.

Two Varo 18-inch xenon searchlights are located atop the pilothouse. One Carlisle & Finch 14-inch, remote-controlled searchlight is located aft on the 2nd deck.

Navigation and communication equipment includes two Sperry radars, two Triton VHF-FM radiotelephones, one Northern SSB radio, two Honeywell fathometers, Hose McCann sound-powered telephone system, and a Galbraith E3750 public address system.

PASSENGER/SUPPLY BOAT 'MARINA S.'

The Marina S. is a passenger/supply vessel built by Mississippi Marine Towboat Corporation of Greenville, Miss., for Dinko's Marine Service of Aransas Pass, Texas. The new vessel is being used for contract work in Gulf waters from Brownsville, Texas, to Key West, Fla. With a length of 100 feet, beam of 24 feet, depth of 11 feet 6 inches, and normal operating draft of 8 feet, the vessel can accommodate 33 passengers and a crew of four.

The combination craft is powered by twin GM Detroit Diesel 16V-71 engines with a total output of 910 bhp at 1,800 rpm, coupled to Twin Disc gears with reduction ratio of 5.17:1. A pair of Lima 50-kw generators driven by Detroit Diesel 4-71 engines operating at 1,200 rpm provide electric power.

The vessel is fitted with a dual-station Orbitrol steering system, Decca RM914C radar, Sperry 8T autopilot, Raytheon 50A VHF radio, Dubose SSB radio, Texas Instruments TI-9900 Loran C,

Marina S.

Furuno F-850 depth finder, and a Kahlenberg D-2 air horn.

Fuel capacity is 18,494 gallons, potable water 1,705 gallons, cargo water 37,644 gallons, and lube oil capacity 150 gallons. Deck cargo capacity is about 35 tons. The vessel is fitted with a central water-cooled air-conditioning system.

Mississippi Marine offers towboat design and construction from initial design through completion. The yard also builds barges and offshore vessels, offering several stock designs that can be custom-fitted to fit individual owners' needs.

The Marina S. was designed by New Orleans naval architect **Coe M. Best Jr.**

UTILITY VESSEL 'PBR-216'

The offshore utility vessel PBR-216 and five sister boats have been completed by The Service Marine Group, Inc. of Morgan City, La., for PBR Offshore, Inc., also of Morgan City.

The PBR-216 has an overall length of 118 feet, beam of 26 feet, depth of 11.5 feet, and draft of 10 feet. Cargo water capacity is 58,000 gallons, fuel oil capacity is 30,000 gallons, and deck cargo load is 103 tons, with additional below-deck capacity of 217 tons.

The utility vessel is powered by two General Motors Detroit Diesel 16V-92N engines with a total output of 1,200 bhp at 1,800 rpm, supplied by George Engine Company, driving Twin Disc 5:1 reduction gears for a speed of 12 knots. Electric power is provided by two Detroit Diesel engines driving 50-kw generators.

Other equipment includes Sitex model 22 radar, Motorola 55/75 VHF radio, Drake TRM-115 SSB radio, SRD model CLX Loran, and Datamarine 2650 depth finder.

TOWBOAT 'PERCHERON'

The 65-foot towboat Percheron was built by Balehi Marine, Inc. of Lacombe, La., for Clydesdale Corporation, Harvey, La. The new vessel is powered by a pair of Detroit Diesel engines supplied by Kennedy Engine Company of Biloxi, Miss. Owners are **Cliff Spanier** and **Larry Gisclair;** the design work was done by naval architect **David P. Levy.**

Twin Disc reduction gears, 6½-inch Aquamet 18 stainless steel shafts, 7-inch Aquamet 18 rudder stocks for the two steering and four flanking rudders, combine with a pair of Coolidge 72-inch by 54-inch stainless steel propellers to assure optimum performance for the Percheron.

Tank capacities are 22,300 gallons of diesel fuel, 9,000 gallons of potable water, and 160 gallons of lube oil.

Pilothouse outfit includes a Furuno KRA-124 radar, two Nautilus Motorola VHF radios, Apelco AH-130 Loudhailer, controls for two Nabrico 40-ton electrohydraulic winches, Perko running lights, Carlisle & Finch searchlights, Buell-Stromberg air horns, Custom Hydraulic steering system, and Kobelt engine controls.

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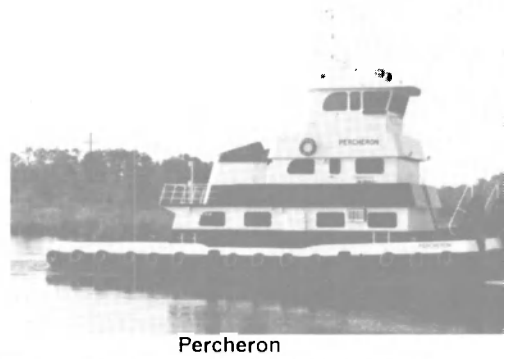

Percheron

Shallow Draft Vessel Review

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FIRE/UTILITY VESSEL 'POINT T'

Halter Marine, Inc. of New Orleans introduced a new line of fire/utility boats with the recent delivery of the 150-foot Point 'T' to Point Venture, Ltd. of Morgan City, La. In addition to her 61,000-gallon liquid mud capacity, the new vessel carries three 6-inch, 2,400-gpm fire monitors capable of pumping water as well as 1,720 gallons of foam.

The Point 'T', with overall dimensions of 150 feet by 36 feet by 14 feet, is powered by two GM Detroit Diesel 16V-149NA engines each developing 900 bhp at 1,800 rpm.

She has a cargo capacity of 275 long tons and has 2,200 square feet of cargo space on her aft deck. She can carry 78,560 gallons of fuel oil, 1,283 gallons of lube oil, 3,974 gallons of fresh water, 108,196 gallons of ballast water, and has a sanitary holding capacity of 895 gallons.

Auxiliary machinery includes two GM 75-kw generators driven by two Detroit Diesel 6-71 engines, a Continental Electric generator control panel, an Engine Monitor monitoring system, two Quincy D325 air compressors, and Aurora fire, ballast, bilge, and fuel-transfer pumps. The vessel is fitted with a Bird-Johnson bow thruster driven by a GM diesel, and the engine room is protected by a fire alarm system and automatic CO_2 flooding system.

Living quarters include six cabins, 20 berths, and a fully equipped galley. Classed by the American Bureau of Shipping A-1 +AMS, Point 'T' meets the requirements of USCG NVC 1-78 and USCG Subchapter I; carries a Panama Canal Admeasurement Certificate; and is approved by the U.S. Public Health Service.

Point 'T'

CREW/SUPPLY BOAT 'PORT ARTHUR'

Progressive Shipbuilders and Fabricators, Inc. of Houma, La. has delivered the aluminum crew/supply vessel Port Arthur to Port Arthur, Inc., also of Houma. The 110-foot boat has a beam of 24 feet and depth of 10 feet 6 inches. She is able to carry 63 passengers and a crew of five, as well as 47 long tons of deck cargo. Normal service speed is 28 knots.

Main propulsion is provided by four GM Detroit Diesel 12V71 engines, each with an output of 445 bhp at 1,800 rpm, supplied by George Engine Company. Twin Disc supplied the four reduction gears, model MG 514, with 2½:1 ratio. Engine controls were supplied by WABCO.

Fuel capacity is more than 6,000 gallons, drill water 7,500 gallons, and potable water 800 gallons.

Navigation and communications equipment, supplied through Rhodes Electronics of Houma, include Furuno FRS 36 radar, Simrad LC 123 Loran C, Konel 1022 SSB radio, and Raytheon DE 750 Fathometer. Two GM/Delco diesel generators provide electric power.

Port Arthur

SURFACE-EFFECT BOAT 'RODOLF'

Rodolf

The Rodolf, a 48-foot surface-effect vessel built by Bell-Halter of New Orleans for the Portland (Oregon) District of the U.S. Army Corps of Engineers, began service with a tour of the Gulf and Atlantic Coasts to demonstrate its operational and hydrographic surveying capabilities.

Two 350-bhp GM Detroit Diesel 8V-92N engines power twin four-bladed propellers, and a Detroit Diesel 105-bhp 4-53N engine drives the 30-inch-diameter lift fan. The widely spaced propellers make the craft highly maneuverable at all speeds, both cushion-borne and hullborne.

As a result of the surface-effect vessel's unique design, the Rodolf is expected to improve significantly hydrographic and surveying technology through its high-speed capability and minimal wake. The boat rides on a cushion of air contained by catamaran style side hulls and flexible bow and stern skirts. At cruising speed the center portion of the hull is clear of the water, supported on the air cushion, thereby reducing resistance, providing higher speed, and improving ride and stability qualities.

Bell-Halter is a joint venture of Bell Aerospace Textron and Halter Marine formed to design, construct, and market air-cushion craft for commercial service.

TRAWLER 'STORM PETREL'

Storm Petrel

Another first for MARCO Seattle was accomplished with the delivery of the fishing vessel Storm Petrel to owner/skipper **George Fulton**. She is a refrigerated seawater, trawler/combination boat, MARCO's first to be designed and engineered principally as a trawler. The new vessel has an overall length of 123 feet, beam of 31 feet, and depth of 14 feet.

Propulsion power for the Storm Petrel comes from a turbocharged and aftercooled Caterpillar D399-TA diesel with a continuous rating of 1,125 bhp at 1,225 rpm, driving a 96-inch Coolidge stainless-steel propeller through Reintjes reverse/reduction gears, providing a normal service speed of 12 knots. Auxiliary power is provided by one Caterpillar 3304N and two Cummins KT1150GC engines.

The vessel features a two-deck aluminum pilothouse above the raised deck. The bridge deck has a 360-degree field of vision, and contains an aft-facing hydraulic control console that includes trawl winch controls.

The new boat has a complete outfit of electronics and other navigational aids, including two radars, two sonars, Loran, and a variety of radio equipment (see accompanying supplier list).

Much attention was given to net- and fish-handling space and equipment aboard the vessel, combining such features as the refrigerated seawater system, an eight-well configuration with a total capacity of 8,800 cubic feet, an articulated stern ramp, and a combination of gear that includes the first pair of MARCO's new WT-303 trawl winches and a removable four-drum stern gantry.

The new hydraulic ramp arrangement, which encloses the boat's stern when not in use, was developed by Mr. **Fulton**. MAR-

CO's new WT-303 winches deliver more power than previous models, providing the ability to handle the loads of midwater trawling. They feature a transmission that allows the winch to maintain constant speed and power once 30 percent of the cable is on the drum.

reduction gears with a ratio of 4.192:1. Two steering rudders and four flanking rudders are operated by independent hydraulic rams.

Two 100-kw generators are powered by GM Detroit Diesel engines. Hot water and heating are provided by a Kewanee boiler; the Dunham-Bush air conditioning system has a capacity of 20 tons.

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Volunteer State

'STORM PETREL' SUPPLIERS

Main engine: **Caterpillar** diesel model D399TA, turbocharged and aftercooled.

Reduction gear: **Reintjes** two-speed hydraulic reversing.

Propeller: **Coolidge** 96-inch-diameter, four-blade, stainless steel.

Steering: **Wagner** hydraulic, model T-19.

Auxiliary engines (3): **Cummins** models KT1150GC and NT855GC, both turbocharged; **Caterpillar** model 3304N.

Radars (2): **Furuno** FR1011 and FR701.

Depth recorders (2): **Furuno** FW-GT22 and FUG-22.

Net recorder: **Furuno** FNR-700.

Sonars (2): **C-Tech** "Omni"; **Wesmar** SS165-2400-FT.

Loran: **North Star** 6000 with SLC Nav-Pac.

Loran plotter: **Epsco** C-Plot II.

VHF radio: **Raytheon** 50A.

SSB radio: **Northern** N571, 150-watt.

Emergency radio: **Northern** N571, 100-watt.

Gyrocompass: **Sperry** SR-130.

Autopilot: **Sperry** 8T.

Intercom: **Raytheon** 350.

Wind speed indicator: **Danforth-White.**

Seawater circ. pumps (4): **Crane/Deming.**

Motors for above (4): **Lincoln.**

Chiller barrels (20): **General Refrigeration.**

Compressors (2): **Carrier.**

Telescoping crane: **Slattery,** 12-ton.

Stern ramp: **MARCO** hydraulic articulating.

Ramp winches (2): **Gearmatic.**

Winches (10): **MARCO** W3000 (3), W0600 (2), W0650 (3), WT303/40 (2).

Net reels (4): **MARCO** RT96S.

Motors for above (4): **Hydrostar** 525.

Bait chopper: **Hansen.**

TOWBOAT 'VOLUNTEER STATE'

The twin-screw, 5,830-bhp towboat Volunteer State has entered service moving commodities on the Lower Mississippi River. Built by Jeffboat, Incorporated in Jeffersonville, Ind., the new vessel is owned by American Financial Corporation and operated by H & S Transportation Company, Inc. and River Lines, Inc. of Nashville, Tenn.

The Volunteer State is powered by two Alco Power Inc. 16-cylinder diesel engines, model 16-251F, each rated 2,915 bhp at 1,200 rpm. These drive five-bladed, stainless steel propellers through two Falk 3040 reverse/

Shallow Draft Vessel Review —Volunteer State

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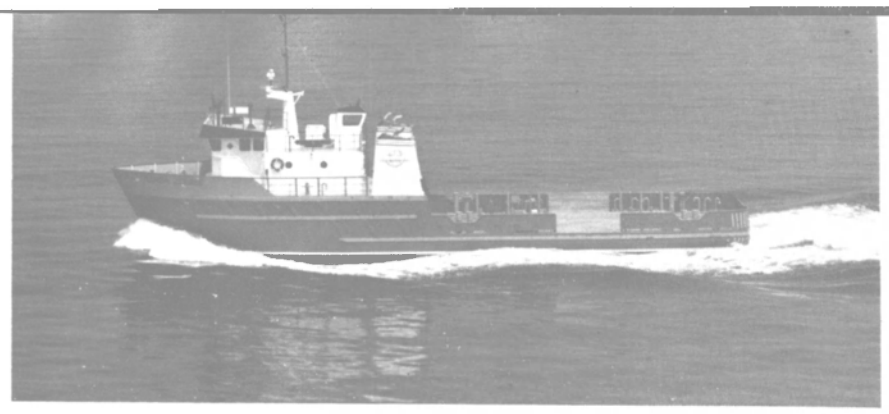
Two Westinghouse 5320B air compressors are each rated 23.8 cfm at 250 psi.

Included in the deck machinery are two Schoellhorn-Albrecht type 21063 10-hp capstans, and four Beebe model 62 5-hp winches. The fire pump was supplied by Ingersoll-Rand.

Among the electronics are a Sperry MXIG-AX radar, Raytheon DE 760 digital depth indicator, and Intech VHF and SSB radios. National Marine Service provided a Series 70 Tugmonitor system, Carlisle & Finch two xenon searchlights, and Kahlenburg a model Q-4 air horn.



UTILITY VESSEL 'WANDA LOUISE'

Hudson Shipbuilders, Inc. (HUDSHIP) of Pascagoula, Miss., recently delivered its fifth vessel for 1980, the 120-foot utility boat Wanda Louise, built for Gerald P. Hebert Enterprises, Inc. of Lafayette, La. Designed by Har Keswani & Associates of New Orleans especially for the production department of Transco Exploration Company, the new vessel will service production platforms up to 125 miles offshore.

The Wanda Louise is said to be a unique vessel for her size. In addition to having an American Bureau of Shipping loadline and being built to U.S. Coast Guard Subchapter I Requirements, her deck cargo capacity is more than 130 tons, and she has freezer/cooler equipment to handle perishable items for the platforms and standby vessels.

Liquid cargo capability includes fuel, industrial water, and triethylene glycol. Heavy-duty, 3-inch pumps are used to transfer these liquids. She is required to off-load cargo in any type of weather, and is equipped with anchor chain and windlass rather than a cable and winch.

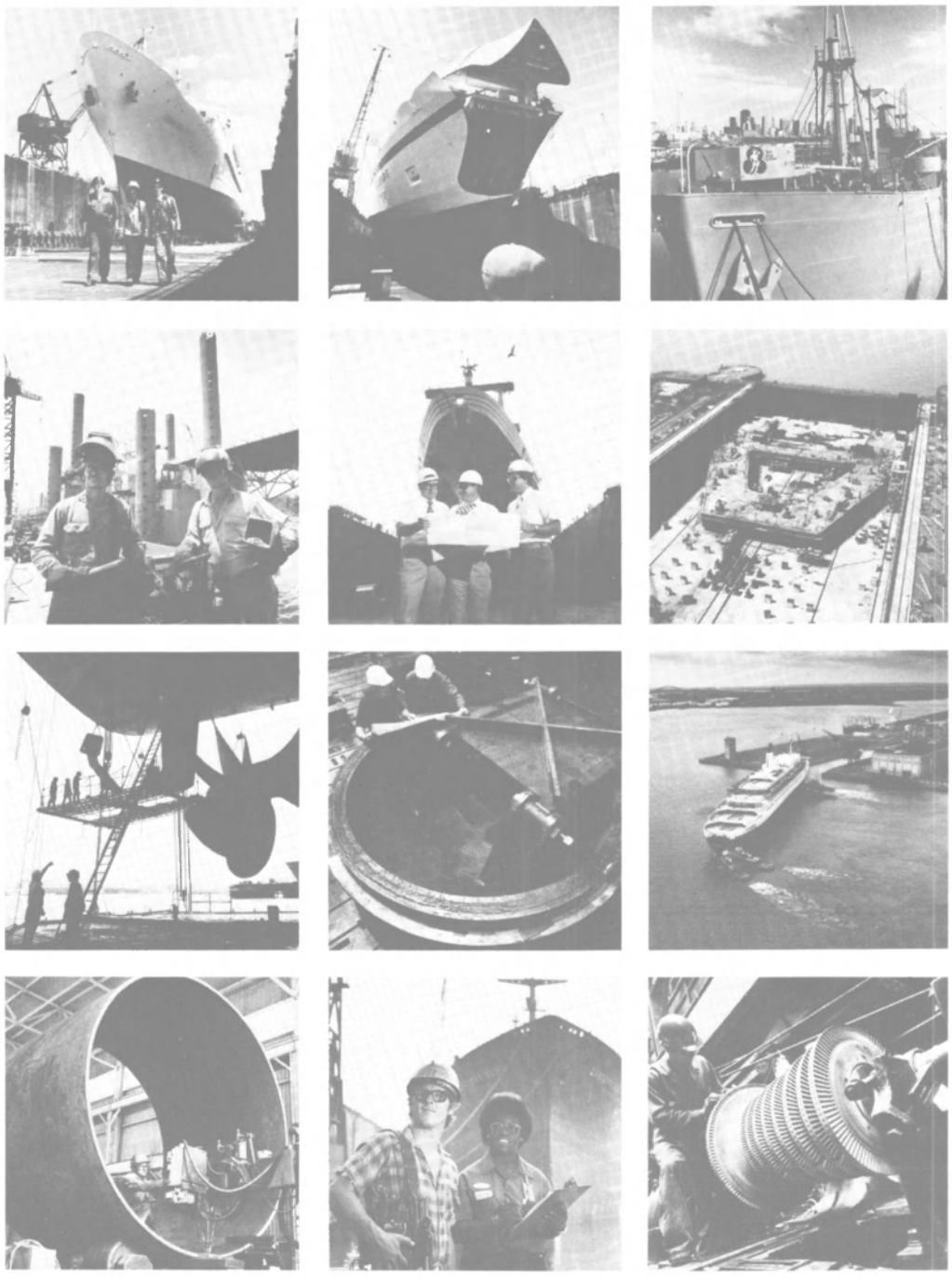
Wanda Louise is powered by twin GM Detroit Diesel Allison 16V92NA engines, each rated 600 bhp at 1,800 rpm and supplied by George Engine Company, and

(continued on page 24)

'WANDA LOUISE' SUPPLIERS

Main engines (2), **GM Detroit Diesel** 16V92 NA.
Reduction gearing, **Twin Disc** 527 5:1.
Engine controls, **Mathers.**
Generators (2), **Delco/GM** 50-kw.
Control panel, **National Electric Coil.**
Keel coolers, **Channel Iron.**
Stuffing boxes, shaft and stern bearings, **Johnson.**
Steering system & autopilot, **Sperry.**
Shaft, **Aquamet** 5½-inch.
Sanitary system, **Red Fox.**
Air compressors (2), **Quincy.**
Pumps, **Barnes; Aurora.**
Anchor windlass, **HBL.**
Radars (2), **Furuno** FR-240 and FR-701.
SSB Radiotelephone, **Marco/Konel** 1022.
Depth recorder, **Impulse** 3601.
VHF Radiotelephone, **SSE** Sea Command.
Loran C, **Micrologic** ML-220.
Engine monitoring system, **Marine Electric.**
Air horn, **Kahlenburg.**
Searchlights (2), **Carlisle & Finch.**
Navigation & running lights, **Perko.**
Fire monitor, **Akron.**
Pump for above, **Aurora.**

BethShip 1981



Bethlehem's shipyard activities cover the waterfront. A dozen are illustrated in our 12½ x 26-in. 1981 wall calendar, a different photograph each month. If you'd like one of these calendars, send your request to:

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Shipbuilding Department
Bethlehem Steel Corporation
476 Martin Tower
Bethlehem, PA 18016

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Shallow Draft Vessel Review —Wanda Louise

(continued from page 22)

Twin Disc model 527 reduction gears. On sea trials the vessel exceeded 12 knots. Auxiliary power is provided by two 50-kw Delco generators driven by GM Detroit Diesel 4-71 engines. Engines are monitored by a 21-point Marine Electric system.

The pilothouse is designed for maximum visibility. Furnished and installed by Rhodes Electronic Service of Houma, La., the vessel's electronics include Furuno radars, Sea Command VHF radiotelephone by SSE, Impulse depth recorder, Apelco Trident loudhailer, Micrologic Loran C, Marco-Konel SSB radio, Nav-Lite panel by Continental Electric, and Sperry steering and autopilot system.

SCALLOPER 'WESTPORT'

Bender Shipbuilding & Repair Company of Mobile has delivered the scalloper Westport to Tradewind Fishing Corporation of New Bedford, Mass. She is the first of four identical vessels to be built at the Bender yard — another for the same owner and two for Donna Lynn Fishing Corporation, also of New Bedford.

This latest series of vessels embodies many changes and improvements arising from operating experience with the fishing boat Tradewind, which was delivered to Tradewind Fishing in 1978. The Westport has an overall length of 98 feet, beam of 25 feet, and depth of 14 feet.

The new vessel is powered by a Caterpillar D399 diesel engine with an output of 1,125 bhp at 1,225 rpm, driving a Columbian Bronze 4-blade, 70- by 75-inch propeller in a Kort nozzle through a Caterpillar clutch and a Cat 7261 reduction gear having a ratio of 3.84:1. Service speed is 11.5 knots; engine controls are Mathers model AD12.

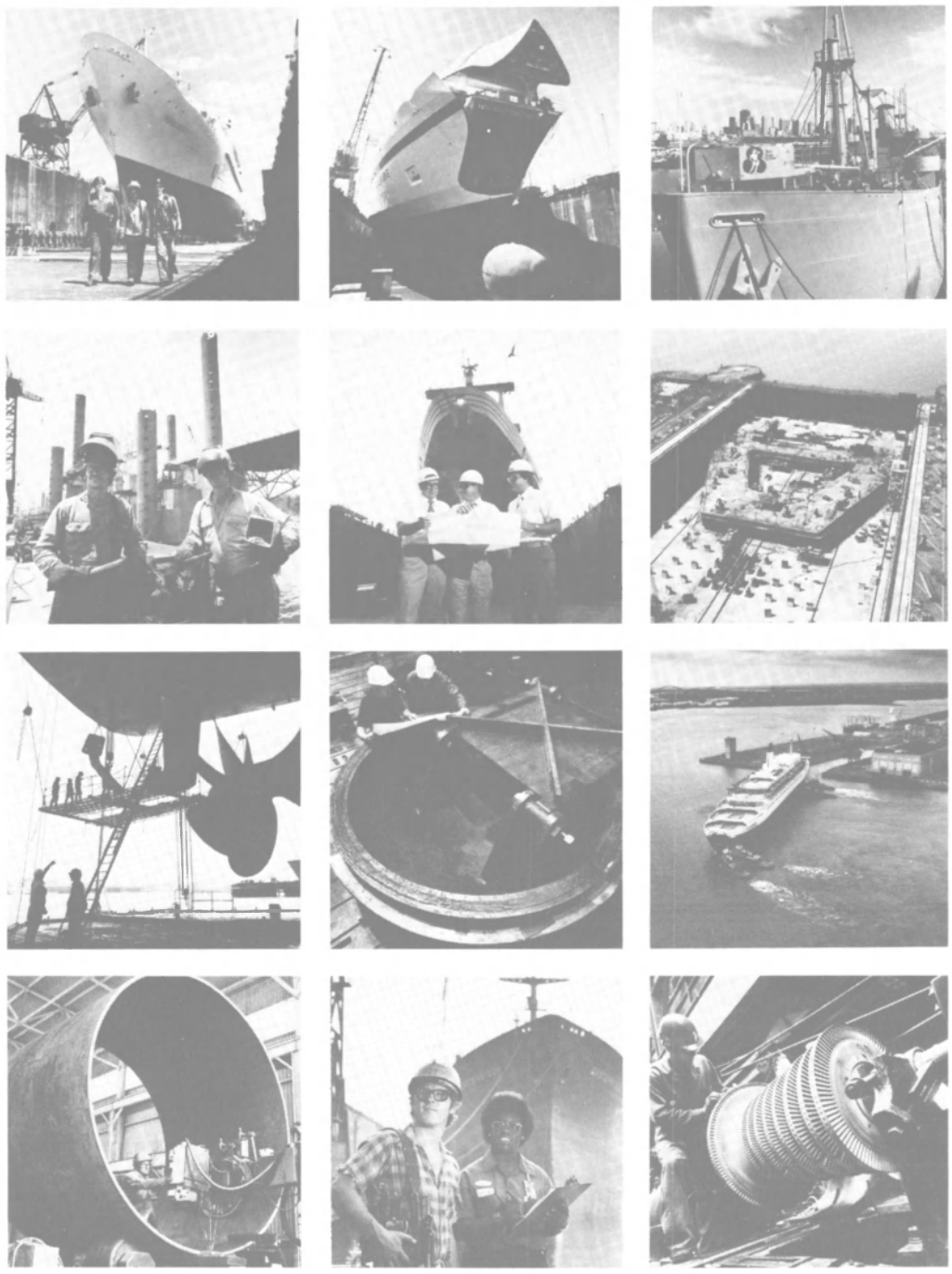
Cutless rubber stern bearings were supplied by Lucian Moffitt; main shaft bearings are Dodge Sleevoil. The main engine is cooled by Fernstrum keel coolers. Two auxiliary engines are Caterpillar model D3304T.

Deck equipment includes two Hathaway model 12 AITHS hydraulic trawl winches and a 16-inch Hathaway trawl block. Hydraulically positioned gallows are moved outboard into fishing position by hydraulic rams. When in this position, fishing loads are carried by the structure of the vessel.

Central air-conditioning by Therman serves the wheelhouse and main and lower deck accommodations. The shucking house aft has Carrier air-conditioning and heating. The 15-person inflatable liferaft was supplied by Swit-Lick, and the air horn is a Kahlenberg model T1.

Electronic gear, supplied as a package by EPSCO and installed by the R.H. Sassaman Company of Mobile, includes the following: EPSCO radar model M16, radar model EB Seaveyor, Loran C model Seanav XL (one 32-volt dc and one 115-volt ac), two model 2001 depth recorders, model 901 autopilot with model 505 standard compass; Cobra CB radio with SSB, Northern SSB radio model N550, Yaesu shortwave receiver model FRG-7, and Raytheon loudhailer.

BethShip 1981



December	49		1	2	3	4	5	6
	50	7	8	9	10	11	12	13
	51	14	15	16	17	18	19	20
	52	21	22	23	24	25	26	27
	1	28	29	30	31			
January	1	28	29	30	31	1	2	3
	2	4	5	6	7	8	9	10
	3	11	12	13	14	15	16	17
	4	18	19	20	21	22	23	24
	5	25	26	27	28	29	30	31
February	5	1	2	3	4	5	6	7
	6	8	9	10	11	12	13	14
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	8	22	23	24	25	26	27	28

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Ed Miske, Barry Hall, Standing: Fred West, Dick Steiner, Duane Cozard, Bernie Logan, Fred Ramsden

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Caterpillar Announces Two Improved Diesels —Free Brochure Available

At the recent Fish Expo in Boston, Caterpillar Tractor Company's Engine Division announced two improved models in its marine diesel engine line. One is a new, direct-injection configuraof the well-accepted turbocharged and aftercooled 3412 marine engine. The direct-injection 3412 DITA version is said to offer some 8-10 percent increased fuel efficiency compared with the precombustion chamber 3412 model.

Higher torque rise, greater operating range, and reduced heat rejection are also features of this new configuration. Approved ratings include 520 bhp (388 kw) continuous and 625 bhp (466 kw) medium-duty commercial at 1,800 rpm. The matched Cat 7221 and 7231 marine transmissions are offered for the continuous rating, with the 7231 offered for the medium-duty commercial rating.

The 3412 DITA is designed primarily for medium to large fishboats (75-95 feet), inland towboats, and offshore utility vessels. With its attractive fuel economy, fishboat owners wanting higher horsepower will find the 3412 DITA and matching marine transmission a logical choice.

The second improved model announced by Caterpillar is the turbocharged 3208 T diesel, which is replacing the current version 3208. Significant component improvements are said to be engineered into the compact, lightweight V8 diesel to extend its application to all levels of commercial propulsion service. Ratings for the 3208 T include 260 bhp at 2,800 rpm for light-duty commercial, 230 bhp at 2,400 rpm for medium-duty commercial, and 200 bhp at 2,400 rpm continuous.

Cat says the 3208 T provides the best power-to-weight ratio and largest displacement of any engine in its horsepower range. The weight of the engine and Twin Disc MG507 transmission is only 2,320 pounds. Displacement of the compact, 90-degree, V8 four-cycle diesel is 636 cubic inches (9.4 liters). The engine is equipped with a rear-mounted, water-cooled turbocharger with single exhaust outlet. Physical dimensions and connection points are the same as the current turbocharged 3208.

For further information and free literature on these two new Caterpillar engine models,

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Ralph Johnson Joins PRC Guralnick In San Diego As Naval Architect

Ralph P. Johnson has joined the San Diego office of PRC Guralnick as a naval architect, according to **John L. Torresen**, vice president and chief design engineer.

Mr. **Johnson**, a graduate of the University of Michigan, had been hull group supervisor at Campbell Industries, San Diego. His background includes five years' experience in the design of large tug, supply, and fishing vessels. A Navy veteran, he performed engineering duties for four years, and last served aboard the attack carrier USS Ranger as boiler officer.

Brown Named General Manager Of Toronto Harbour Commissioners

Ian C.R. Brown, who has been with the Toronto Port Authority for nine years, has been appointed general manager of the Toronto Harbour Commissioners, according to an announcement by **Karl Jaffary**, chairman of the board. Mr. **Brown** succeeds **Ernest B. Griffith**, who remains as executive director of World Trade Centre Toronto, which is operated by the Commissioners.

The new general manager joined the Port Authority in 1971. Over the years he has held various posts. He was appointed assistant general manager in 1975. Mr. **Brown** is first vice president of the Canadian Port and Harbour Association. He is also on the board of the Canadian Importers Association.

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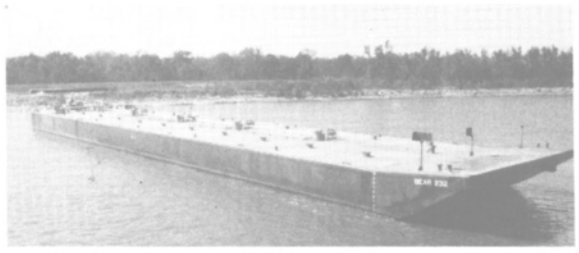
Bergeron Enters New Product Line With Four Tank Barges

Bergeron Industries, Inc. recently delivered four tank barges from their Braithwaite, La., marine facility, marking the company's entrance into a new product line. Long a major designer and builder of deck barges, Bergeron is using this experience in tank barge construction.



Bear 232 (pictured above) is the second of two single-skin tank barges designed and built for Alabama River Towing of Mobile. The barges measure 264 feet by 50 feet by 11 feet, and have a total tank capacity of about 23,000 barrels. They are equipped with steam coils and a stripping system. Although they are single-skin design, the barges are certified by the Coast Guard as a Type III hull for carriage of hazardous cargoes, including benzene, and possess an American Bureau of Shipping load line for limited offshore service.

N.M.S. No. 2301 was rebuilt from a 297-foot 6-inch by 54-foot by 12-foot, double-skin box-type barge for National Marine Service. The box barge was cut into two pieces, with new rake sections built and installed to produce two 205-foot by 54-foot by 12-foot semi-integrated barges. N.M.S. No. 2301 and N.M.S. No. 2300 are Coast Guard approved for Subchapter 0 products, and possess American Bureau of Shipping load lines for limited offshore service.

Levingston To Build $45-Million Jackup Rig For Noble Drilling Corp.

Ed Paden, president of Levingston Shipbuilding Company of Orange, Texas, has announced plans to build a second Levingston Class 111-C jackup drilling rig for Noble Drilling Corporation of Ardmore, Okla. Noble Drilling, a leading domestic drilling contracting firm formed in 1921, is a wholly owned subsidiary of Noble Affiliates, Inc. In addition to the two new jackups on order with Levingston, Noble owns seven platform rigs, three shallow-water mobile rigs, three inland rigs, and 34 land rigs.

Overall dimensions of the triangular-shaped rig are 200 feet by 186 feet by 23 feet. The 414-foot-long, square-truss legs allow the vessel to drill in water depths of 300 feet and to a maximum well depth of 25,000 feet. Design criteria of the cantilevered unit make it capable of operating under the harshest weather conditions. The unnamed jackup will be able to withstand winds of up to 109 knots and seas of 50 feet. Accommodations will be provided for a crew of 54.

This is the fifth in a series of jackup rigs to be built at Levingston. They provide further continuity in the company's plan to equally divide yard efforts between conventional shipbuilding and offshore projects. Levingston is optimistic about additional offshore business as well as continuation of its successful bulk carrier program.

The approximate cost of this rig is $45 million. Completion is scheduled for December 1982.

Bulkfleet Marine Awards Maintenance System Contract To Stanwick

The Stanwick Corporation's Operations Engineering Division has been awarded a contract by Bulkfleet Marine Corporation to provide an automated maintenance management system for Bulkfleet's two dedicated, deep-notch tug/barge units (DDNTBU) in the 28,000-dwt class, powered by four economically efficient heavy fuel burning diesel engines.

The system to be installed by Stanwick provides simple yet effective means for managing and documenting preventive and repair maintenance actions. As an automated system, it is characterized by operational simplicity, minimum paperwork for chief engineers, and timely and efficient production of maintenance status and machinery history reports.

According to **Dexter Rumsey,** a vice president of Stanwick's Operations Engineering Division and designer of Stanwick's automated maintenance management system, the system will achieve improved equipment reliability and extended equipment life at lower manpower and parts costs. The system is of a modular design, which allows customers the flexibility and capability to address unique and specific reporting requirements through customization and adaptation of the full spectrum of maritime operational needs.

Bulkfleet Marine Corporation's director of engineering **Bob Osmer** predicts that these two tug barge units will offer customers the most economical transport service currently available in the petroleum and bulk products industries.

Three New Management Appointments Made At Crowley Maritime

Three appointments have been made in Crowley Maritime Corporation's International Division, according to a recent announcement by **Richard F. Andino**, San Francisco, Crowley vice president and general manager of the division.

Tom Pickford has been appointed manager of marine operations, a newly created position with responsibility for coordinating the division's efforts in all facets of marine equipment evaluation and control. Mr. **Pickford** was previously instrumental in various Crowley joint venture operations, including a recent stint as managing director of a Tokyo-based joint venture service. He is based in San Francisco.

Bill Coleman has been named division area manager for Central America and is based in Mexico City. He is responsible for developing markets throughout Central America and representing Crowley's interest in TAB, a joint venture with the Mexican steamship company Transportation Maritima Mexicana S.A. TAB provides equipment and services to the oil and marine construction industries in Mexico and Central America. Mr. **Coleman** brings over 15 years' maritime experience to the position, including service for Crowley in Indonesia and the Caribbean.

Cecil Payne has assumed responsibilities as project manager of a TAB rock-haulage contract at Dos Bocas, Mexico, the site of a new tanker terminal. Prior to this appointment, he served in a number of capacities for Crowley, most recently as director of special projects for Crowley's Caribbean Division, Jacksonville, Fla.

Newport News Awarded $51-Million Navy Contract For Attack Sub Work

Newport News Shipbuilding in Virginia, a unit of Tenneco Inc., has just received a U.S. Navy contract worth about $51 million for detail design and yard services in support of nuclear-powered attack submarines (SSNs). The Newport News yard currently has eight submarines of this type under construction or on order, at a total contract value of more than a billion dollars.

J.P. Fischer Elected Operations VP For American Steamship

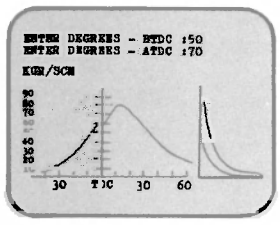
Joseph P. Fischer

Joseph P. Fischer has been elected vice-president operations. it was announced by **Thomas W. Burke**, president of American Steamship. **Mr. Fischer** joined American Steamship as senior marine superintendent in 1977, and was elected vice president-engineering in 1979. He spent nearly 19 years with the naval architectural firm of R.A. Stearn, Inc. of Sturgeon Bay, Wis. Mr. **Fischer** started his marine career in 1947 as a loftsman for the Christy Corporation, now a part of Bay Shipbuilding Corporation, also of Sturgeon Bay.

$36-Million Research Contract Awarded By Navy To Johns Hopkins

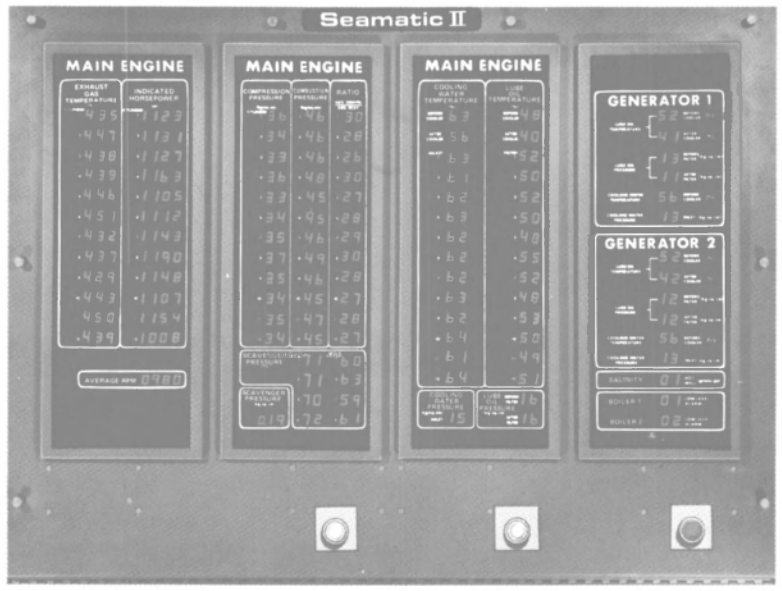
The Johns Hopkins University, Applied Physics Laboratory, Laurel, Md., has been awarded a $35,916,600 modification to a previously awarded contract for research work connected with tactical/strategical systems and space science, research and development, and other related areas. The Naval Sea Systems Command was the contracting activity. (N00024-78-C-5384)

SELF CONTROL FOR SHIPOWNERS



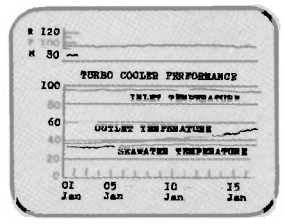
Diesel Tuning

Data Display



Data Display Unit

CRT Video Station



Trendline Analysis

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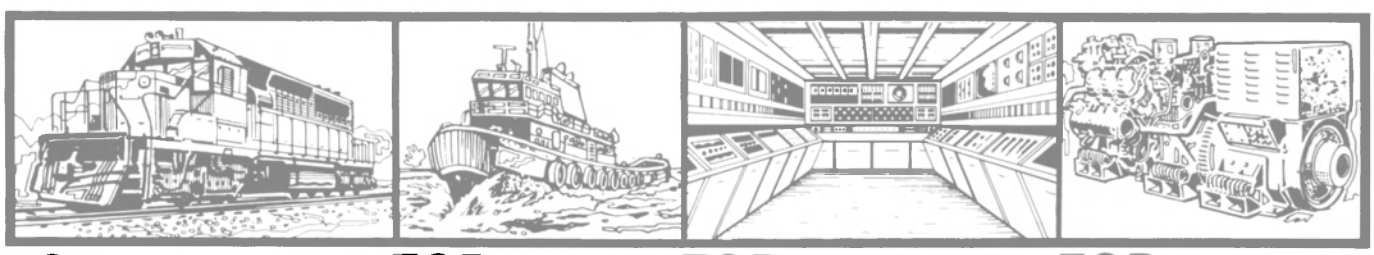

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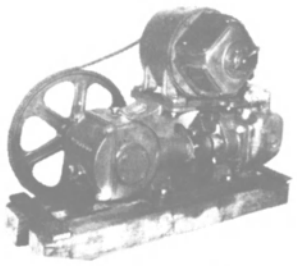
PUMPS

WORTHINGTON 2½x2 SANITARY & FLUSHING PUMP — 20 GPM — 80 LBS



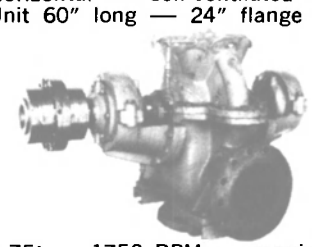
Motor driven type KAA — 1½" suction — 1" discharge. MOTOR: 2 HP — 230 VDC. Can also be furnished with A.C. motor if desired.

UNUSED 5"x4" — 500 GPM @ 20 PSI — 1800 RPM WEIL GENERAL CIRCULATOR SERVICE PUMP

With totally enclosed explosion-proof motor. Bronze pump — horizontally split case — flooded submergence test pressure 300 PSI. MOTOR: Continental 10 HP — 440/3/60 — 1800 RPM — fan cooled — totally enclosed — horizontal — self-ventilated — EXPLOSION-PROOF. Unit 60" long — 24" flange to flange.

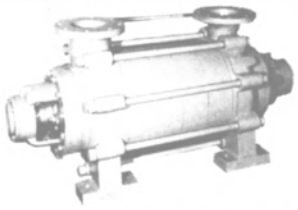
2000 GPM @ 75'

BRONZE PUMPS



8X8 — 2000 GPM @ 75' — 1750 RPM — requires 50 HP 440/3/60 1750 RPM motor — frame 445-S. Pumps are ball-bearing split case centrifugals with cast iron driplip base. Very good condition.

UNUSED NIJUIS FIRE PUMP — PUMP ONLY



HID-5125250 — 531 GPM @ 323' head @ 1800 RPM

6X5 BRONZE GARDNER-DENVER PUMP

Split case type D — 1000 GPM — 125 lbs — 281' @ 1800 RPM. Requires 100 HP diesel drive. Suction lift 15 to 25' — 10½" diameter flange. 6" Suction 5" Discharge.

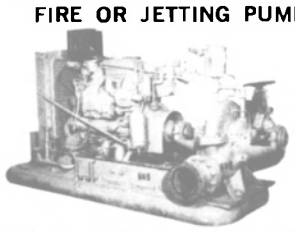
"EUREKA" DUPLEX DOUBLE-ACTING RECIPROCATING BILGE PUMP 500 GPM — 100' HEAD

Motor driven — pump operates at 320 RPM. MOTOR: 15 HP — 440/3/60 1750 RPM. DIMENSIONS: 5'9" high — 3' wide — 4' deep. Ex-M.V. Globtic Sun.

NIJUIS 3510 GPM DIESEL DRIVEN FIRE PUMP

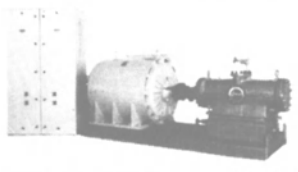
3510 GPM @ 350' head — 161.7 PSI. Pump is 10X8 — factory new — horizontally split case. ENGINE: GM 6V-71 or 8-V-71. Can furnish with heat exchanger & radiator.

GARDNER-DENVER 6 X5" BRONZE CENTRIFUGAL FIRE OR JETTING PUMP



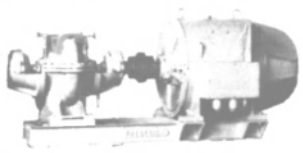
Driven by GM 3-71 diesel engine. PUMP: 1000 GPM @ 150 PSI/1500 GPM @ 100 PSI — 1750/2000 RPM. Maximum head 175 PSI. Self-contained fuel tank in base. Automatic self-priming optional.

NEW UNUSED — 700 GPM — 150 PSI DELAVAL ROTARY PUMP



6X8 — 700 GPM @ 150 PSI — 1150 RPM — with 4-speed motor & control 100/75/50/37.5 HP — 440/3/60 — 1200/900/600/450 RPM. With Cutler-Hammer controller.

UNUSED BRONZE 2000 GPM @ 337' HEAD FIRE OR HIGH PRESSURE SERVICE PUMP

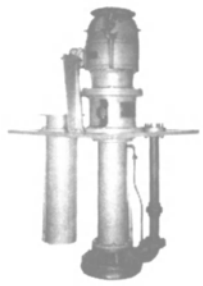


Mfg by Frederick Iron & Steel — 8" side discharge; — 8" bottom suction — model 8DSU-SPL. MOTOR: Crocker Wheeler — 250 HP — 240 volts DC — 1900 RPM — 102 7/8" O.A.L. — 34½" wide — 37" high.

NEW UNUSED KINNEY 20 GPM FUEL OIL SERVICE PUMP

Vertical — 50 PSI — with 2" inlet & outlet. MOTOR: 2 HP — 440/3/60 860 RPM — with starter. For fuel oil service, etc.

NEW UNUSED SUMP OR LOW PRESSURE DRAIN PUMPS



Bronze — 40 GPM @ 40 PSI. 2" Discharge — single impeller — CW rotation — 32" from deck plate to base. Complete with flotation equipment. Totally enclosed 5 HP 440/3/60 1725 RPM motor. Repair parts for motor & pump included.

CARVER CHILLED WATER SERVICE PUMP 160 GPM — 57 PSI

For air conditioning or water circulation. 160 GPM @ 57 PSI — 110 ft. head. Closed coupled — 10 HP 440/3/60/3500 RPM.

500 GPM FIRE SERVICE PUMP

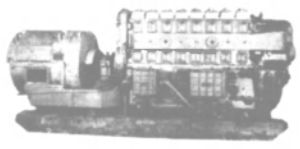
Mfg. by Buffalo. Bronze — 500 GPM @ 100 Lbs. — 5X4 — 30 HP/240 DC — 105 amps — 1750 RPM.

PASSENGER/CRUISE SHIP SELF PRIMING NEW WORTHINGTON VERTICAL SUBMERSIBLE BILGE PUMP

FOR EMERGENCY USE ON PASSENGER SHIPS, ETC. PUMP: JAS — 264 GPM — 171' head — two 6" inlets — one 5" outlet. MOTOR: 40 HP — 230 volts DC — 149 amps. COMPLETE WITH NASH — SELF PRIMING PUMP ATTACHED.

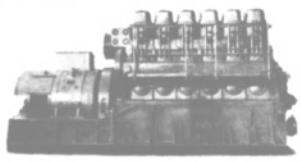
DIESEL GENERATOR SETS

290KW GM 8-268A DIESEL GENERATOR SET



120/240 VDC—1250 amps—shunt wound. ENGINE: GM 8-268A — 8 cyl — 6½X7 — 1200 RPM — good condition.

300KW BALDWIN DIESEL GENERATOR SET

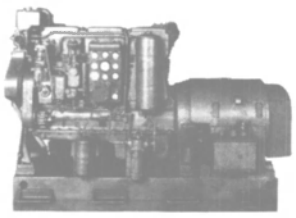


300KW — 120/240 VDC — 1250 amps — stab. shunt — 450 RPM. Baldwin diesel model VO. Ex C-1MAVO1.

100KW GBD8 DIESEL GENERATORS

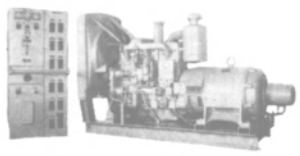
From LST vessels. 120/240 VDC — 417 amps — stab shunt — 1200 RPM — Delco generator — self-excited. ENGINE: Superior GBD-8 — 8 cyl — 5½X7 — 150 HP — 30 volt electric starting. Reconditioned to ABS. Dry weight 10,000 lbs. — OAL 124" — 65 11/16" high — 42" wide. Height necessary to pull piston 68". Fuel consumption 0.620 lbs/hr.

60 KW CUMMINS DIESEL GEN. SETS



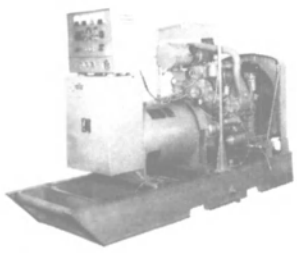
60KW — 120 volts — 500 amps DC generators. 6-Cyl. model H Cummins diesel engine.

75 KW CUMMINS DIESEL GENERATOR SET



75KW — 93.8 KVA — 440/3/60 — 1200 RPM — electric starting. Cummins 6-cyl engine with free-standing switchgear.

GM-4-71-T TURBO-CHARGED 100 KW DIESEL GENERATOR SET RADIATOR COOLED 1800 RPM

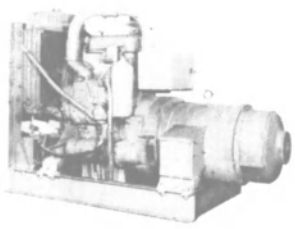


12 wire — all voltages possible — 100 KW 440/220/3/60. With switchgear. Has protective cabinet.

GM 8-268A 200 KW A.C. DIESEL GENERATOR SETS

ENGINE: 8-268A — 6½" bore — 7" stroke — 1200 RPM — driving Westinghouse generator — 200 KW — 440 volts — 3-phase — 60 cycle — 321 amps — 80% PF @ 1200 RPM. Switchgear available.

20KW 2-71 DIESEL GENERATOR SETS TEST RUN 1 HOUR



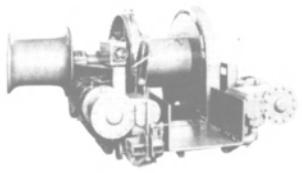
220/3/60 — 1200 RPM — Electric Machinery Co. or Delco. Brushless — will demonstrate running. (Also have 20KW sets with 220/440/3/60 — with brushes — 1200 RPM — Delco. Weight 2200 lbs.)

GM 3-268A 100 KW DIESEL GENERATOR SETS

ENGINE: GM 3-268A — 6½X7 — 1200 RPM — 80% PF — electric starting. GENERATOR: 100 KW — 440/3/60/1200 RPM — 161 amps. Dripproof — open — self-ventilated. (Class A insulation stator — class B insulation on field). EXCITATION: 2 KW DC unit — 9′ 1¾″ long — 37″ wide.

WINCHES

STEAM MOORING WINCHES

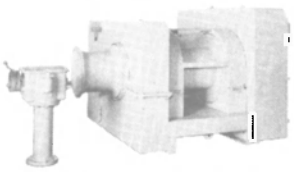


12″ X 14″ — AUTOMATIC TENSIONING with foot brake & declutchable gypsy head 20,000 LBS @ 100 FPM — FIRST LATER ALSO HANDLES 16,000 @ 150 FPM OR 50,000 @ 8 FPM.

Drum will show 1500 ft or 1½″ wire in 9 layers. Steam inlet 3½″ — 4″ exhaust — 171 PSI working pressure. BASE DIMENSIONS: 6′ X 6′ 3½″ — overall 8″ 4½″ wide x 9′ long. Mfg by Friedrich Kocks.

ALL UNITS CAN BE DEMONSTRATED RUNNING

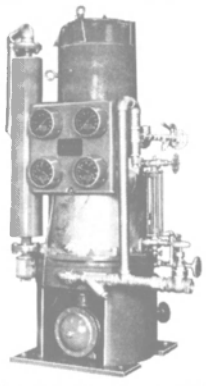
MODEL U1 UNIT WINCHES



7450 Lbs. @ 223 FPM. G.E. 50 HP Motor — 230 VDC. With controls and master switch.

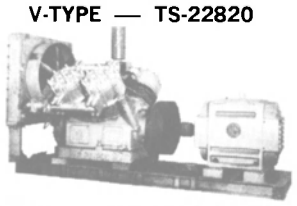
AIR COMPRESSORS

NASH MULTI-PHASE CONTROL AIR COMPRESSOR 50 CFM — 100 PSI



Model MV-673. Continuous pressure maintained by pressure control valve. Complete with motor, heat exchanger, separator, silencer, pressure control valve, water seal pressure control valve. CAPACITY: 50 CFM @ 100 PSI — 3500 RPM. Motor 27 HP — 440/3/60. Cooling water flow 35 GPM — relief valve set for 110 PSI. Vertical configuration. Pressure switch: on 80 PSIG — off 100 PSIG. Just removed from AT&T Vessel "Long Lines". Excellent condition.

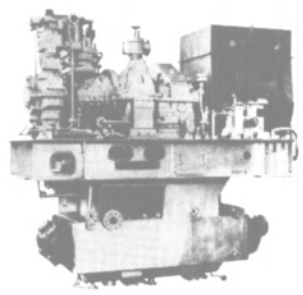
MARINE SHIPBOARD AIR COMPRESSOR V-TYPE — TS-22820



160 CFM @ 125 lbs — two stage 870 RPM — 8X8¼X8¾ — air cooled — with intercooler. Direct — connected air compressor #2261021. MOTOR: 50 HP 440/3/60 — mfg by U.S. Motor. AIR COMPRESSOR: Mfg by Air Pumps Ltd. Excellent condition — formerly used on AT&T Vessel "Long Lines" and removed only because they needed a larger unit. Complete with inter- and after-cooler. Very good condition.

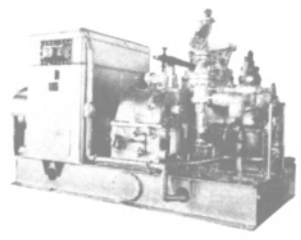
TURBO GENERATORS STEAM TURBINE — GEARS

1000 KW DELAVAL ALLIS-CHALMERS GEARED TURBO GENERATORS



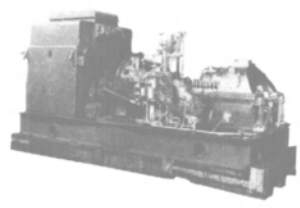
DeLaval turbine 1442 HP — 10019 RPM — class GJN — 9-stage — 1050 PSI — 950° TT. GEAR: 10019/12000. GENERATOR: Allis-Chalmers 1000 KW — 450/3/60/1200 — static excitation. Complete with condenser & switchgear optional. Send for brochure.

750 KW G.E. 7-STAGE TURBINE



450/3/60/1200 RPM — type FN3-FN24 — 10033 RPM. GEAR: 10033/1200 RPM. GENERATOR: type ATL — 6-pole — 450/3/60/1200 RPM — 0.80PF. EXCITER: 10KW 120 volts DC. Steam inlet 2½″ — 125% load — 2 hour normal steam condition. Normal steam condition 525 lbs/825°TT — 1 lb absolute back pressure at turbine exhaust flange. Steam flow 100% load 7870 lbs. OAL 11′ 4½″ — OAW 6′ ½″ — OAH 6′ 4″. Total weight 24,500 lbs.

MARINER CLASS TURBINE & GEAR ONLY



G.E. 700KW DRV618-MR73 — 10938/1200 RPM 850 PSI — 850°TT — GEI-90755 CONDENSING. Complete with rotor bearings, diaphragms, packing, etc. Gear complete — type S — 432 — Form B — 10938/1200 RPM.

TURBINE & GEAR ONLY — NON-CONDENSING

G.E. 700KW DRV318-MR1 — 10938/1200 RPM — 850 PSI — 850°TT — 24 PSIG exhaust pressure. Rotor, diaphragms, packings, bearings available.

AUXILIARY TURBO GENERATORS ROTORS ETC.

- **400KW DELAVAL ROTOR — 7-STAGE — CLASS CD — 5910 RPM**

835 lb W.P. — 840°TT — ex-Esso: Gloucester — Dallas Class — some Beth Sparrows Point & Quincy vessels, & Newport News Hulls 499-504 — in Book 820.

- **750KW DELAVAL ROTOR — 7-STAGE — CLASS G.J.**

9823 — 585/865# steam pressure

- **GEARS**

Class KD — 9283/1200 — ex-City Service "Alton Jones" type vessels

GE ROTOR NEW 750 KW

Type FN-3-FN24 — 7-stage — 10033 RPM

WESTINGHOUSE NEW 1250 KW

540# — 825°TT — 8050 RPM

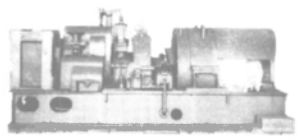
- **FOR G.E. T2 VESSELS**

G.E. DORV-325M — 5654 RPM — T2 tanker

- **WESTINGHOUSE 538KW**

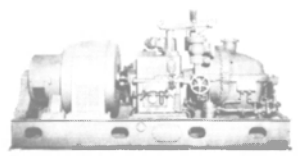
5010 RPM — T2 vessel

TURBINE & GEAR ONLY



New DeLaval type H.D. Turbine — #245204 — gear type KDC — 730 HP — 440# — 740°TT — 9977 RPM — with reduction gear output 1200 RPM. Turbine serial #245204.

G.E. 300KW TURBO GENERATOR & GEAR

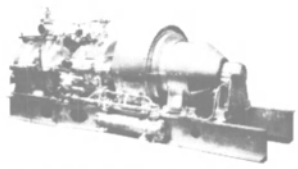


G.E. 300KW generator & 40KW D.C. exciter — 450/3/60/1200 RPM — ex USN D.E. vessel. TURBINE: DORV-325N — 4873 RPM — 400# — 50°F superheat.

300KW WESTINGHOUSE — LOW PRESSURE TURBINE & GEAR ONLY

Condensing or non-condensing designed for 300KW— 5286 RPM/1200 RPM on gear. CAPACITY: 300KW Normal 250 psi — 0°superheat — 25″ vacuum 180KW — 250 psi — 0°superheat — 3 psi back pressure 300KW — 200 psi — 0°superheat — 25″ vacuum. Steam/hour 6463 lbs — 100% load — steam/KW hr. — 20.88.

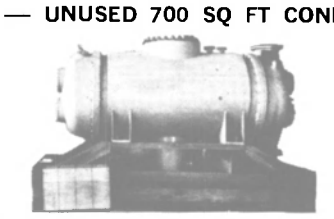
TURBO GENERATOR SET NEW — 200KW A.C. — 40KW D.C.



Ex USN — turbine type DN — 5-stage — 10012 RPM. GEAR: s-155 — single hellcal. GENERATOR: 200KW — 450/3/60/1200 RPM. Steam conditions: 540# — superheat 197°/208°.

MISCELLANEOUS

2 NEW — UNUSED 700 SQ FT CONDENSERS



Mfg by American Locomotive Works. 700 sq ft — 2-pass — gunmetal waterbox & return head. ⅝″ tubes — 0.049″ (18 BWG) — cupronicel 70-30 — 100″ effective length — 476 tubes. Located San Pedro, Calif. With hot well — 20″ Center steam inlet — 9″ inlet & outlet. Shell 30 lbs/head 30 lbs.

Technology Survey Of Major U.S. Shipyards

A Survey Of 13 U.S. Shipyards And 16 Foreign Shipyards Identifies 16 Areas Where U.S. Shipyards Lag Behind Their Foreign Counterparts

Robert Lowry, William L. Stevens and John D.F. Craggs*

At the end of World War II, the United States had the largest and most productive shipbuilding industry in the world. During the past 30 years this country's shipbuilding industry has contracted to a fraction of its former size and has only in recent years made substantial investments in new facilities. On the other hand, foreign shipbuilders, notably the Japanese, have invested billions of dollars since WWII in new facilities and can now produce merchant ships in a much shorter time and with substantially fewer manhours than are required in the United States.

In an effort to improve the productivity of the U.S. shipbuilding industry the Maritime Administration (MarAd) initiated the National Shipbuilding Research Program, which since 1971 has sponsored and jointly funded research and development (R&D) projects with a view toward improving the competitiveness of the industry. However, there has not been a uniform evaluation of the technology being applied to all phases of shipbuilding with a view toward identifying industry-wide needs. The R&D programs to date have usually dealt with development of specific equipments and procedures where deficiencies have tended to be apparent.

In 1975 the British Government conducted a technology survey of all U.K. shipyards in connection with the nationalization of the industry. After seeing the procedure used, MarAd concluded that a similar survey of major U.S. shipyards would be useful.

In May 1978 MarAd contracted for an assessment of the level of technology now being employed by major U.S. shipyards, as compared with the best comparable foreign shipyards. The procedure used to make this assessment was the same as that used in the United Kingdom.

This report identifies U.S. ship construction operations and procedures that are lagging behind their foreign counterparts. It is hoped that this survey will provide guidance in two ways:

1. Encourage individual shipyards to examine in depth areas where they are using low-level technology, and

2. Serve as a baseline to the Government for determining what shipyard improvement programs it should support.

In considering the results of the survey, there are two important caveats:

First, shipyard productivity depends upon a combination of many factors. The facilities, tools and procedures covered in this survey are most important, but they are only as good as the people who manage and operate them. This survey does not measure management, motivation or effort.

Second, this survey identifies only the levels of technology being used. The decision by a ship-

(continued on page 36)

*Mr. **Lowry**, president, and Mr. **Stevens**, vice president, Lowry and Hoffmann Associates, Inc., Arlington, Va., and Mr. **Craggs**, director, A&P Appledore International, Ltd., Newcastle upon Tyne, England, presented the paper condensed here before the recent Annual Meeting of The Society of Naval Architects and Marine Engineers. The complete paper, with comments, will be published in the 1980 TRANSACTIONS.

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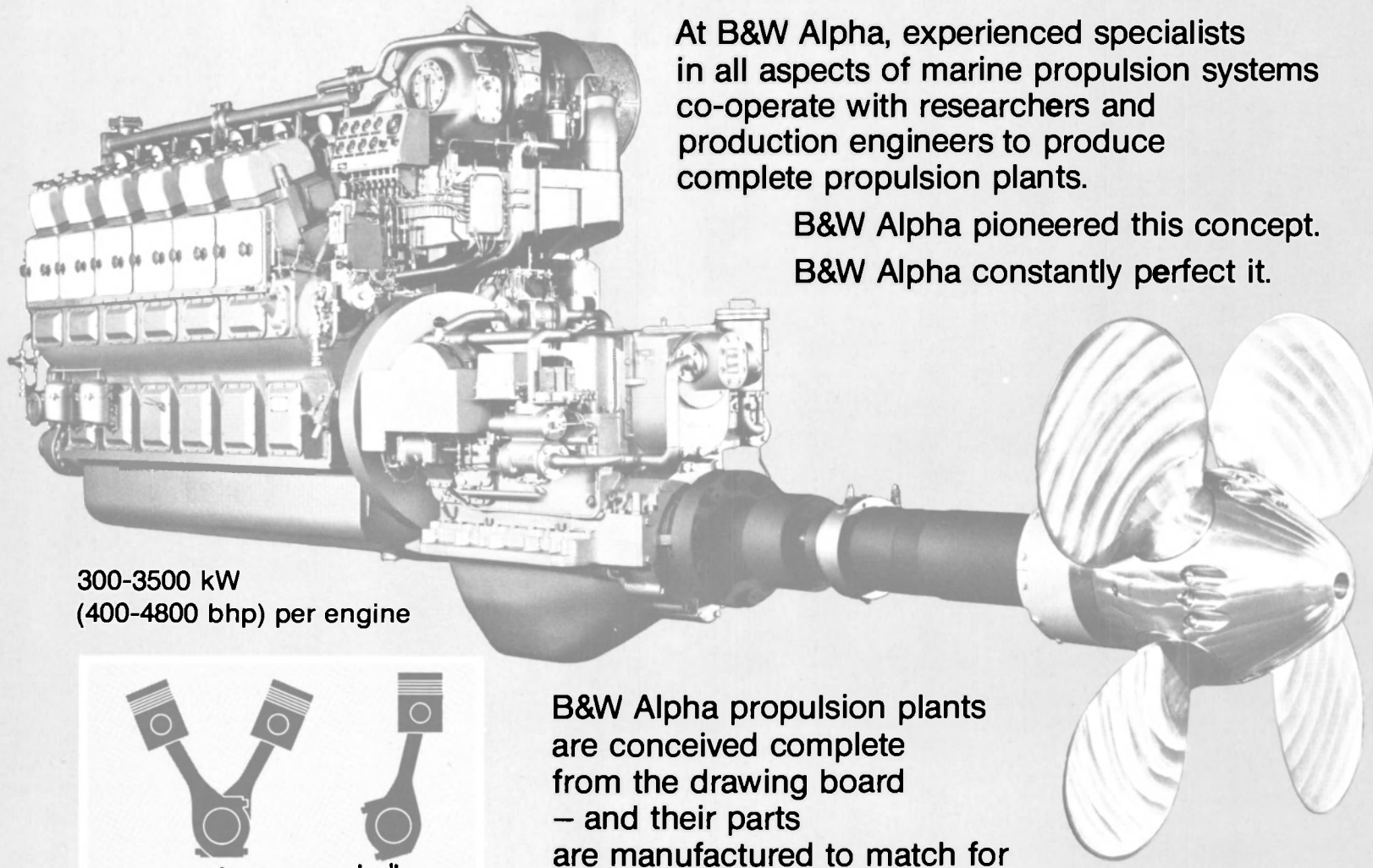

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Technology Survey Of Major U.S. Yards

(continued from page 34)

yard to use more advanced technology would depend upon an economic feasibility analysis that takes into account the market and the characteristics of the individual shipyard.

Survey Procedure

The evaluation system used for this technology survey was developed by A&P Appledore International, Ltd. (APA). The survey was conducted by Marine Equipment Leasing, Inc. (MEL).

The system for evaluating shipbuilding technology was first used in an extensive study prepared for the British Government. The purpose of the U.K. study was to obtain a commonly based, objective appreciation of the quality and quantity of the hardware and the associated methods and technology being used in each shipyard. Since that time, the system has been formally applied in Canada, France, Egypt and India.

Information on the technology and methods employed in each shipyard is collected by way of a survey of these principal operational categories:

A. Steelwork Production
B. Outfit Production and Stores
C. Other Pre-erection Activities
D. Ship Construction and Outfit Installation
E. Layout and Materials Handling
F. Environment and Amenities
G. Design, Drafting, Production Engineering and Lofting
H. Organization and Operating Systems

These categories in turn have been broken down into 70 elements. Each of the 70 elements covers a discrete shipbuilding operation or procedure.

A descriptive set of standards for each of the 70 elements was prepared. These standards consist of examples of methods and practices which typify each of four levels of technology for each element. The surveyor is thereby able to assign a "level of technology" to each aspect of shipyard operation which is studied. During the survey, the "closest" whole level number is marked and comments peculiar to the shipyard and element being studied are recorded.

The selection of the U.S. shipyards to be surveyed was based primarily on size, employment and product. Since the survey included foreign shipyards building primarily for deepsea commercial service with some naval construction, the largest of the U.S. shipyards building for this service were selected. These shipyards are now building over a broad span of complexity and ship size, from a nuclear-powered aircraft carrier and submarines to gas turbine-powered frigates and from commercial ships ranging from a 10,000-dwt tanker to 395,000-dwt ultralarge crude carriers (ULCCs) and liquefied natural gas (LNG) ships.

In order to survey 13 U.S. shipyards in the allotted time, two survey teams were required. The earlier surveys of foreign shipyards also involved different surveyors. All surveyors, however, used the same standards and essentially the same survey techniques. Several steps were taken to assure consistency of survey results.

First, during the week of June 5, 1978, two senior members of the APA staff conducted a workshop for the six MEL surveyors on survey content and procedure. The workshop covered in detail what was included in each of the 70 elements and a discussion of the four technology levels for each element. This workshop and the ensuing exchange of views enabled the U.S. surveyors to be on the same "wavelength" as their British counterparts.

The second step taken by MEL to assure consistency and comparability of data was to design data sheets for collecting data.

The third step took place after

(continued on page 38)

RAYCAS.
Because safety at sea is no accident.

The world's finest Collision Avoidance system is also the most economical.

Will you collide? RAYCAS (Raytheon Collision Avoidance System) provides the answer in seconds, and helps you select the best evasive action.

RAYCAS combines a compact computer module with a Mariners Pathfinder® 16-inch Bright Display radar. This provides three unique installation options:

1. add only the RAYCAS module to an existing Raytheon 16-inch Bright Display radar;
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3. install the complete RAYCAS/Raytheon Bright Display Radar System.

Whichever you choose, you get a proven Collision Avoidance System that exceeds existing requirements . . . and cost less than other units.

Unmatched radar performance.

The Raytheon Bright Display presentation helps make RAYCAS the most effective Collision Avoidance System in the world.

In addition to direct daylight viewing, it features two-level video and automatic interference rejection. This provides the clutter suppression and noise-free picture so essential for reliable target acquisition and tracking. Proven 3 and 10-cm interswitch capability assures compliance with MARAD requirements for dual installations.

User-oriented presentation.

RAYCAS uses basic radar system video as input for the computer. The computer-generated collision avoidance symbols are then electronically superimposed directly on the Bright Display radar picture. As a result, observers can use familiar radar procedures assisted by target vectors, points of potential collision and other anti-collision data.

RAYCAS features.

- *Relative-motion Display:* Centered or 70% off-centered with course-up or north-up.
- *True-motion Display:* Own ship moving across scope with course-up or north-up.
- *Target Acquisition:* Manual or automatic with fixed and adjustable guard zones.
- *Tracked Targets:* Up to the 20 most dangerous targets.
- *Target Vectors:* Indicate true or relative courses and speeds; adjustable time base helps predict future position.
- *Target Trails:* Indicate target's past position and course.
- *Dangerous Targets:* Automatically selected by pre-set CPA (Closest Point of Approach) and TCPA (Time to CPA).
- *Points of Potential Collision:* Automatically displayed.
- *Digitally Displayed Data:* CPA and TCPA; own ship's speed and course; target's range, bearing, speed, and true course; own vector length; vector time; BCR (Bow Crossing Range) and BCT (Bow Crossing Time).
- *Trial Maneuver:* Scope displays results of own ship's trial course and speed changes.
- *Visual and Audible Warnings:* Dangerous target, target in guard zone, equipment fault, trial maneuver, and target lost.
- *Automatic Drift Correction:* Computed by tracking on fixed navigation aid.
- *Navigation Lines:* Scope presentation of 8 lines for fairways.
- *Brightness Controls:* Separate adjustments for radar and computer video.
- *Performance Monitor:* Manual or automatic monitoring of radar performance.

Two-year warranty.

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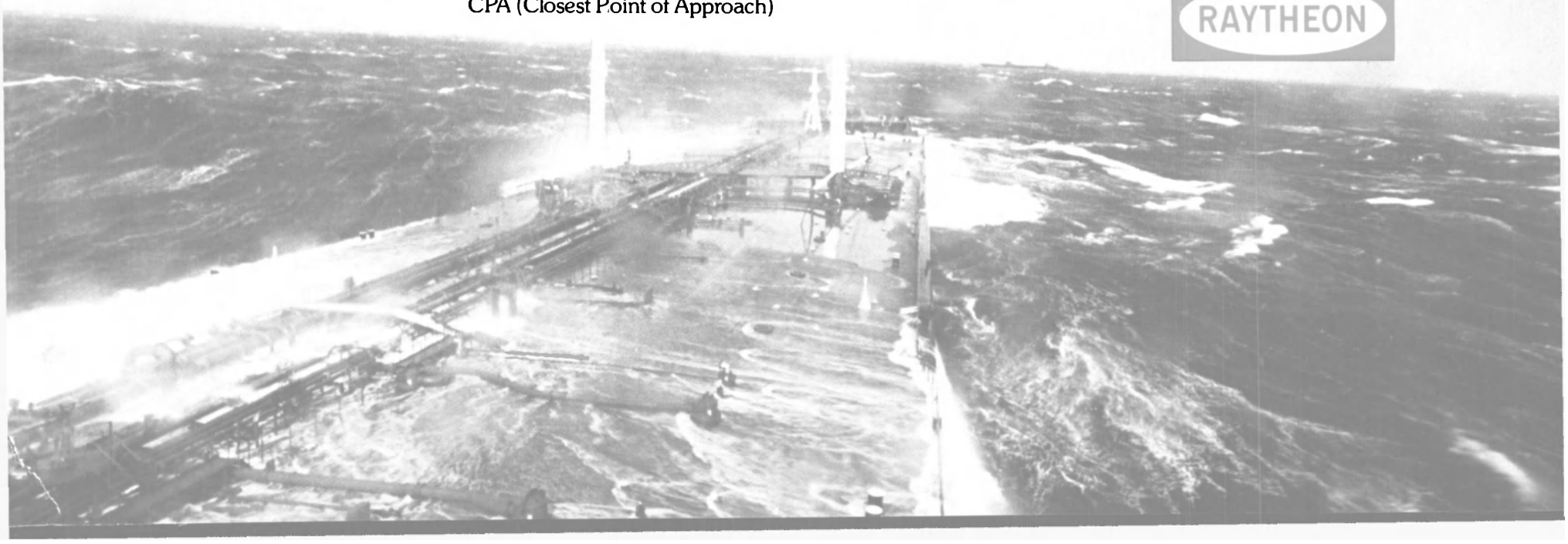


Technology Survey Of Major U.S. Yards

(continued from page 36)

the survey when all the surveyors met and exchanged annotated data sheets. Initially, each surveyor assigned a technology level to each element he surveyed. When the data sheets were exchanged with the counterpart surveyor on the other team, the level assignments were withheld and the counterpart surveyor read the notes and made his own level assignments. Then, the two surveyors compared notes and reached agreement on the level assignments. This was done between the three pairs of surveyors that made up the two teams. It turned out that the surveyors were in agreement at least 90 percent of the time.

The fourth and final step took place in England. During the process of comparing U.S. shipyards with foreign counterparts, each level assignment was reviewed using the surveyors' notes with the same staff engineers who conducted the workshop so as to assure consistency with the APA survey of the foreign shipyards.

The selection of foreign shipyards took into account all the information contained in the descriptions of the U.S. shipyards provided by MEL. For all the foreign shipyards, levels of technology have been assigned in accordance with the same standards by which the U.S. shipyards were judged. In half of the shipyards, APA had conducted a full survey of facilities, equipment, technology and methods. For the remaining shipyards, senior APA staff members had spent a minimum of two manweeks in each shipyard during the past three years. In selecting comparable foreign shipyards the following criteria were used: work experience past and present, maximum ship length, number of employees, physical size, and type of shipyard, that is, new or redeveloped. A total of 25 shipyards representing six countries — Japan, Germany, France, Denmark, Sweden and the U.K.—were selected.

Comparison and Analysis

The approach was to go from the broad to the detail level, from the eight categories to the 70 elements. More specifically:

1. The average technology levels of the U.S. and foreign shipyards for each of the eight categories are presented in four different ways to provide a broad perspective of the differences found.

2. Certain of the 70 elements are identified as critical and are presented in some detail.

3. Areas in which the U.S. shipyards measure favorably are identified.

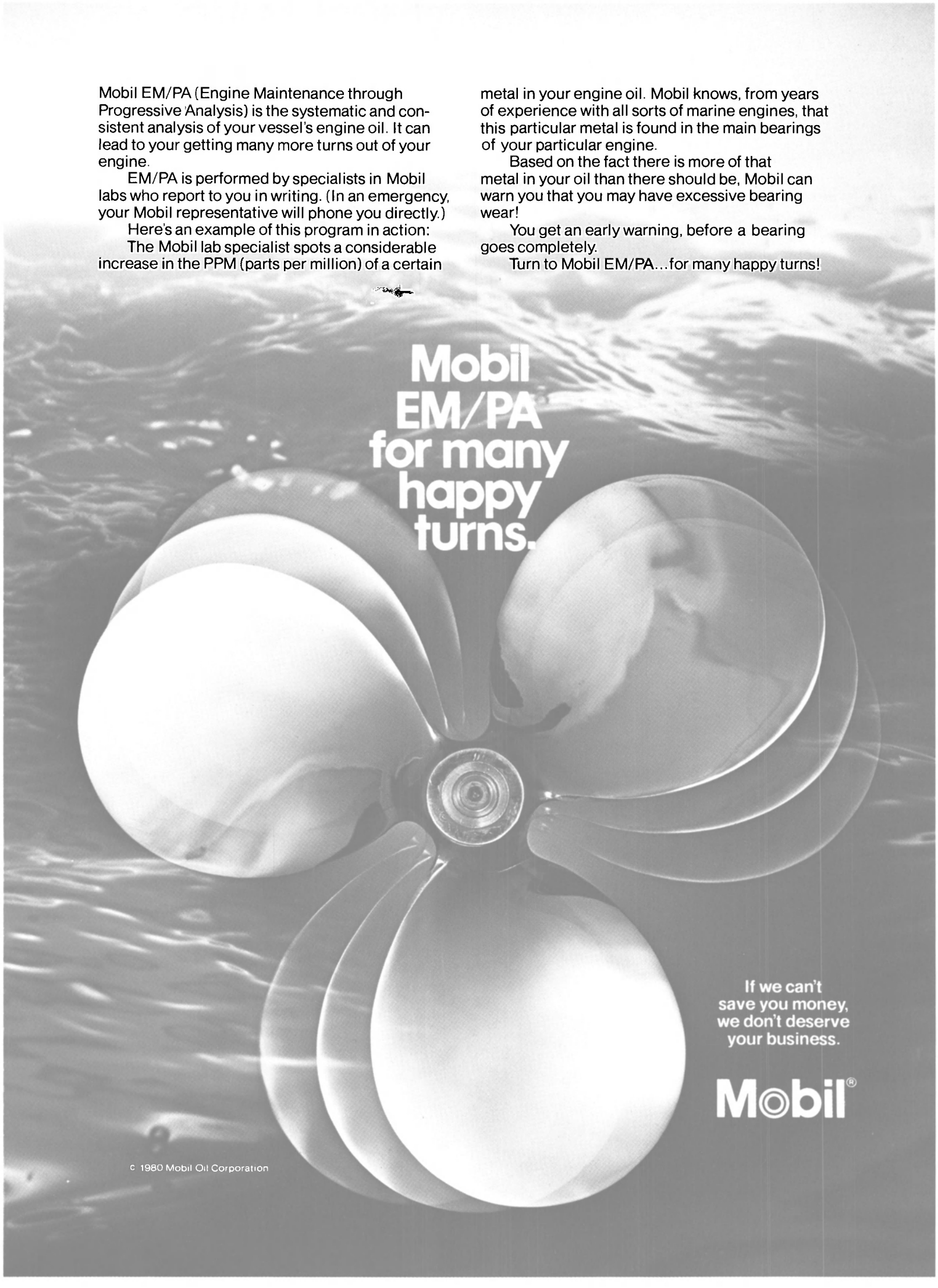
4. Some of the causes of technology level differences are identified.

The data developed during this technology survey provide a wealth of detail for comparison and analysis. Some of the information presented in this paper shows the following:

The U.S. shipyards lead the foreign shipyards only in Category B, Outfit and Production Stores. Average technology levels are the same for Category H, Organization and Operating Systems. For the remaining six categories, U.S. shipyard technology levels are lower on the average, the greatest disparities arising with Categories C and F, Other Preerection Activities and Environment and Amenities, respectively. The first four categories (A-D) cover the technology employed in the "hands-on" manpower-intensive part of a shipbuilding project. Two of the remaining four categories primarily concentrate on the workplace and working conditions. The last two deal with the engineering and systems elements which direct and control the hands-on work. In actual fact, these last four categories are supportive since their purpose is to make it possible for the workforce to complete the ship in as short a time period as possible with minimum expenditure of manpower.

The shortfalls in three of the

(continued on page 40)



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Technology Survey Of Major U.S. Yards

(continued from page 38)

first four categories stem from two broad causes. One concerns facilities and equipment, for example, covered workplaces, semi-tandem building berths, heavy-lift cranage. The other concerns items which are amenable to solution by thoughtful execution of the elements comprising the last four, and particularly, the last two categories. Examples include the adoption of extensive preoutfitting practices, construction of modules, and improved dimensional control. In a number of cases, management initiative alone is all that is needed.

Early in the assessment of the survey findings, it was noted that the technology levels of the larger shipyards were higher than those of the smaller shipyards. The major U.S. shipyards were divided into three size groups of two, six and five shipyards — large, medium and small, respectively — to test this observation. The foreign shipyards were divided into comparable groups of four, ten and seven shipyards by keeping them with the specific U.S. shipyards with which they are compared throughout the survey. This showed that medium-sized U.S. shipyards compared least favorably with their counterparts.

On the average, the U.S. shipyards were assigned high technology levels on those elements involving the coordination and control of shop and ship work. The very nature of the task of meshing all of the actions, physical and otherwise, essential to building a complex ship, coupled with Department of Defense work management requirements, certainly has contributed to this good showing.

Summary

The primary objective of this survey is to provide shipyard management and the Government with comprehensive information on which to base and evaluate plans for improving shipbuilding and technology.

U.S. shipyards on an average are using a lower level of technology than foreign shipyards in six of the eight major categories studied.

The survey shows that of the 70 elements examined, foreign shipyards, based on overall averages, employ a higher level of technology in 51 cases. When shipyard size is considered, the larger the shipyard, the higher the technology. This is true for both U.S. and foreign shipyards. The smaller of the major U.S. shipyards tend to be more on a par with their foreign counterparts. The most marked differences in technology levels are found in the medium-sized shipyards that account for nearly half of the major U.S. shipyards.

Fuller Named Executive Vice President For American Steamship

D. Ward Fuller

D. Ward Fuller has been elected executive vice president of American Steamship Company, it was announced by **Thomas W. Burke,** president of the GATX subsidiary company. Mr. **Fuller** joined American Steamship in 1977 as special assistant to the chairman, and was elected vice president-finance in 1978, and vice president-marketing in 1979. Prior to joining American Steamship, he was corporate treasurer for GATX Leasing Corporation in San Francisco. He was assistant vice president, world banking group, Bank of America from 1973 to 1975, and maintained a private law practice between 1970 to 1973.

J.M. Wilson Named Vice President-Engineering At Philadelphia Resins

John Murray Wilson

John Murray Wilson has been promoted to vice president of engineering for Philadelphia Resins Corporation, Montgomeryville, Pa. He also will be in charge of product research and development, and the engineering of field applications for the corporation's industrial, marine and rope divisions. He also will continue to maintain contact with the corporation's worldwide distributors and factory-trained, certified representatives.

In his new position, Mr. **Wilson** will continue to maintain important contacts with key individuals in various departments or disciplines within the U.S. Navy, the U.S. Coast Guard, and worldwide classification and manufacturing societies.

Prior to joining Philadelphia Resins in 1973 as chief engineer, Mr. **Wilson** served as service supervisor for marine and industrial applications for General Electric Company. His five years of service with GE (USA) was preceded by service with General Electric of England, and with Associated Electrical Industries (AEI), also of Great Britain.

Webb Institute Receives $3,500 Grant From Gulf Oil Foundation

Webb Institute of Naval Architecture, Glen Cove, N.Y., has announced receiving a $3,500 Departmental Assistance Grant from the Gulf Oil Foundation. Institute officials said that the Grant will be used for its General Scholarship Program to further its education in naval architecture and marine engineering.

The purpose of Gulf's departmental assistance grants is to further special projects proposed by colleges and universities. In addition to departmental assistance grants, other phases of Gulf's Aid to Education Program include: undergraduate scholarships, graduate fellowships, employee gift matching, capital grants, and various special grants.

The check was presented to vice Adm. **C.R. Bryan,** president of Webb Institute, by **John W. Kimble,** director machinery design of Gulf.

Clements Named Group VP At Tracor Components, Succeeding J.D. Hughes

Frank W. McBee Jr., chairman and president of Tracor, Inc., has announced the election of **Walter A. Clements** as group vice president of Tracor Components. Mr. **Clements,** also president of Littelfuse, Inc., a Tracor subsidiary in Des Plaines, Ill., succeeds **Jack D. Hughes,** who retired from the company effective December 31, 1980.

Mr. **Hughes** had served as group vice president of Tracor Components since Tracor's 1968 acquisition of Littelfuse, Inc., a 54-year-old electrical and electromechanical components manufacturing firm which he joined in 1943 and served as president of between 1965 and 1980.

Mr. **Clements** has been with Littelfuse since 1950, beginning as a sales engineer and advancing to vice president of distribution sales and advertising in 1958 and vice president of sales and marketing in 1961. In 1969, he was elected executive vice president of Littelfuse and a member of the board of directors. As group vice president of Tracor Components, Mr. **Clements** will remain as president of Littelfuse and become chairman of the Littelfuse board of directors.

Walbridge Reelected Chairman Of AIMV— Other Officers Named

John R. Walbridge has been reelected chairman of the board of the American Institute of Marine Underwriters (AIMU). Elected along with Mr. **Walbridge** (senior vice president of The Insurance Company of North America) were: **Edward K. Trowbridge,** deputy chairman (senior executive vice president of Atlantic Mutual Companies); **Thomas O. Clark,** vice chairman, (vice president, Ocean Marine Division of the Commercial Union Assurance Companies); **Thomas A. Fain,** president; and **George S. Zacharkow,** treasurer (chairman of the the Marine Office of America Corporation).

Seven other American marine insurance market executives were elected to AIMU's board of directors: **Harry S. Keefe,** Talbot, Bird & Co., Inc.; **Warren P. Noll,** Royal Insurance Companies; **John E. Greene,** Hartford Insurance Companies; **William Mack,** American International Marine Agency; **Richard N. Maiocco,** Aetna Insurance Company; **Sam V. Tranchina,** Great American Insurance Company; and **George W. Stellwag,** Highlands Insurance Company.

Colantone Named Senior Account Executive At Crowley Maritime

Michael Colantone has joined the Crowley Maritime Corporation's Caribbean Division as senior account executive for Chicago, according to a recent announcement by **Robert G. Homan,** senior vice president and general manager of the division. As senior account executive Mr. **Colantone** will be responsible for marketing Crowley's services in Indiana, Michigan, and Illinois. He comes to Crowley with over 25 years of transportation experience.

Mr. **Colantone** may be contacted at (312) 828-0670, Crowley's Midwest Regional Marketing Office, 500 North Michigan Avenue, Chicago, Ill.

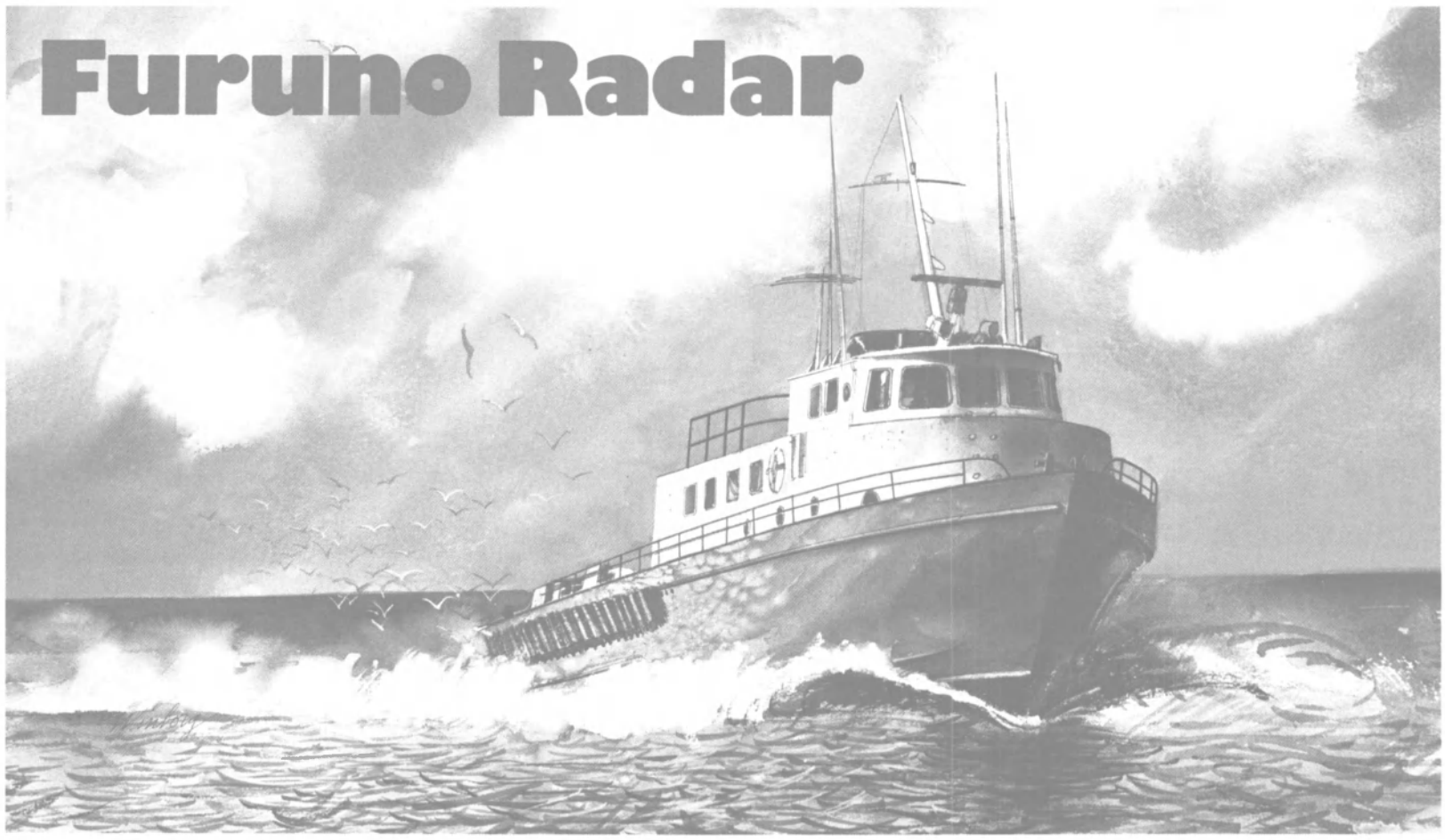
Steven Moodie To Retire As President And Director Of Interocean Shipping

The retirement, effective January 31, 1981, of **Steven M. Moodie** as president and director of Interocean Shipping Company and its subsidiaries, Venoil and Venpet, Inc., and Steamship Service Corporation has been announced by **Thomas T. Church,** vice president, Bethlehem Steel Corporation, transportation. The companies are wholly owned subsidiaries of Bethlehem Steel.

Mr. **Moodie,** who has also served as vice president of Bethlehem Steel's Marine Division and Great Lakes Steamship Division, is concluding 38 years of service with Bethlehem. He was graduated from the New York State Maritime College in 1942. He joined Calmar Steamship Corporation, a former subsidiary of Bethlehem, that year as a third mate and sailed on various Calmar vessels during World War II.

After the war, he sailed on ore carriers of the Ore Steamship Corporation, and in 1947 became master of the S/S Bethore. In 1951, he became port captain in the New York office of Bethlehem's steamship companies. In 1954, Mr. **Moodie** was promoted to marine superintendent and assumed responsibility for all shoreside operations of the deck department.

He has since served in various capacities in marine operations at Sparrows Point, Md., and New York. He was named manager of the Great Lakes Steamship Division with offices in Cleveland in 1968, and was appointed assistant vice president of the Water Transportation Subsidiary Companies in 1972. Mr. **Moodie** was elected president and director of the various steamship companies in 1975, and has been responsible since then for Bethlehem Steel's water transportation operations.



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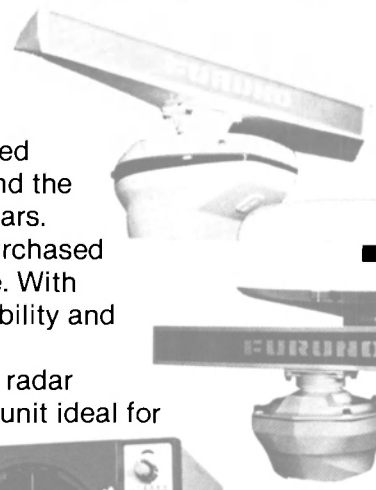

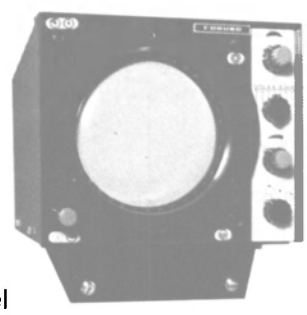

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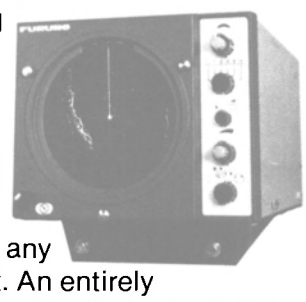

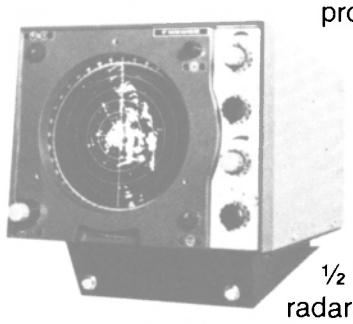

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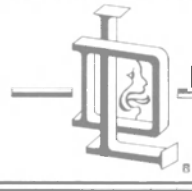

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Promet Gets Orders From Sedco, Sun Contractors For Four Drilling Units

Promet Private Limited of Singapore, in collaboration with Baker Marine Corporation of Ingleside, Texas, has announced the signing of contracts with Sedco, Inc. of Dallas to construct two self-elevating, cantilever beam mobile drilling platforms. These repeat orders from Sedco follow a contract won by Promet early in 1980 to construct a 151 by 156 by 18-foot platform that is scheduled for delivery in March 1981.

Baker's responsibility lies in the design and engineering of the platforms, and furnishing to Promet all structural design drawings and system schematics required for construction according to the standards of the American Bureau of Shipping.

Construction has begun on the first rig and the second will be started in March 1981, with deliveries scheduled for the first half of 1982. Both rigs will measure 174 by 162.5 by 18 feet, and will have three independent truss legs 301.5 feet long. The units will be raised and lowered by means of Baker Marine rack and pinion electro-hydraulic drives.

Both BMC 200 I.C. class jackups will operate in water depths up to 200 feet, and will have a jacking speed of 60 feet per hour. Each rig will have 10,800 short tons of total holding capacity in drilling position. Designed with three-level quarters, each rig will provide accommodations for 70 personnel.

At the same time, Promet announced receipt of contracts from Sun Contractors for construction of two four-legged jackup barges — making a total of three units of that type and two three-legged barges ordered from Promet by Sun Contractors. The latest barges ordered will measure 130 by 69 by 10 feet, and are scheduled for delivery in September 1981 and January 1982.

Dieselcare '80 Conference Stressed American Activities

Some 150 delegates attended recent Dieselcare '80 Seminar at the New York Hilton Hotel. At lectern greeting opening session is moderator **Perry W. Nelson,** executive vice president of M. Rosenblatt & Son, Inc.

This year's successful edition of the popular Dieselcare Seminars that are sponsored by *Shipcare & Maritime Management* was held recently at the New York Hilton Hotel. In a departure from previous years, the general theme of the two-day conference was based on the experience of American shipowners with medium- and slow-speed diesel engines, including operations, maintenance, fuels, training, spares, and other aspects.

Moderators for the four sessions were: **Perry W. Nelson,** executive vice president, M. Rosenblatt & Son; **Barry K. Brown** of Worth Shipping Services; **Robert J. Bazzini,** Eastern Region marketing manager,

Transamerica Delaval; and Professor **S.G. Christensen** of the U.S. Merchant Marine Academy. The final session concluded with a panel discussion, "Coping With Fuel Quality Problems."

Megasystems Building New $1.5-Million Center In Boca Raton, Florida

Fast-growing Megasystems, Inc., designers and manufacturers of state-of-the-art microprocessor electronic monitoring and control systems is building a full-scale additional executive and manufacturing center in Boca Raton, Fla.

The Cleveland-based Megasystems originally planned the new $1.5-million, 26,000-square-foot facility as a headquarters site, but burgeoning sales have forced an alteration of the original plans. Under the new plan, the recently enlarged Cleveland facility will continue to service the Great Lakes and Canada. Centered on a five-acre site in the Arvida Park of Commerce, the new Megasystems facility is expected to be completed by March of 1981.

In anticipation of the formal opening, a temporary sales and hiring center already has been opened to recruit and train qualified personnel to staff the new facility.

According to **Dean Chimples**, president of Megasystems, the Boca Raton location was selected for two reasons: it is one of the world's largest electronics manufacture and supply centers; and it has fast and easy access to the Caribbean, Europe, the Mediterranean, and the Gulf Coastal areas—all of them areas in which Megasystems serves major shippers and shipbuilders.

Founded in 1975 to develop complete marine automation systems, Megasystems has fitted more than 3,000,000 dwt of vessels in the past two years and, with the current expansion and in-hand orders, expects to more than double production within the next year.

WOMA Announces New Sales Brochure On Its Water-Blasting Equipment

WOMA Corporation of South Plainfield, N.J., a leader in high-pressure "water as a tool" technology, has a new sales brochure describing their unique industrial cleaning and maintenance systems. Over 25 years of research and development, innovation, and experience has resulted in a wide array of field-proven systems that meet the requirehents of virtually all industries, including shipbuilding, quickly, safely, and efficiently. Because of the unique properties and ready availability of water, WOMA's systems not only function where strict environmental controls are necessary, but can also save money over other cleaning methods, according to the manufacturer.

The brochure's cover depicts two of WOMA's high-pressure water units, highlighted by their powerful four-gun operation. Inside is a section illustrating some typical WOMA systems that can range in horsepower from 10 to 500, and feature diesel and electric drivers. Some of the more important and unique features of WOMA systems are detailed, including the WOMA pump, specially manufactured by WOMA for their high-pressure water systems. Another section is devoted to depicting some of the hundreds of WOMA accessories.

For the free brochure and further information on WOMA high-pressure water cleaning and maintenance systems,

Write 36 on Reader Service Card

Re-engining Of Seatrain Ships Discussed At New York SNAME

The topic at the recent meeting of the New York Metropolitan Section of The Society of Naval Architects and Marine Engineers — the annual joint get-together with The Society of Marine Port Engineers New York — was the re-engining of the four Seatrain Lines' Euroliner Class containerships.

In each of these four ships, the original gas turbine propulsion units were replaced with two Stork-Werkspoor nine-cylinder, medium-speed TM620 engines, each rated at 16,000 bhp when burning heavy fuel. Each engine drives a Lips controllable-pitch propeller at 90 rpm through single-reduction Lohmann and Stolterfoht gears. The conversion work was performed at the Ross yard of Howaldtswerke-Deutsche Werft of Hamburg.

The principal author was **L.J. Neut,** technical manager, Marine Division, Stork-Werkspoor Diesel, B.V. of Amsterdam, the Netherlands. He was assisted in the presentation by Stork's **P. van Oirschot** and **P. Wieske**. The three men presented an interesting and informative description of the Seatrain conversions, including economic aspects, fuel considerations, testing of propeller designs by Lips, measurements at the Netherlands Ship Model Basin, and some operating experience.

Principals at recent joint meeting were (L to R): **George Murphy,** president of The Society of Marine Port Engineers New York, N.Y., Inc.; **L.J. Neut,** technical manager, Marine Division, Stork-Werkspoor Diesel, B.V. of Amsterdam, Holland, author; and **Eric Lithen,** chairman of the New York Metropoliitan Section of SNAME.

SNAME Chesapeake And MTS Washington Sections In Joint Meeting

Authors and officers at recent joint SNAME/MTS meeting included (L to R): **Peter E. Wilkniss,** NSF, author; **Wilbur G. Sherwood,** NSF, author; **Alexander Landsburg,** Maritime Administration, secretary-treasurer, Chesapeake Section SNAME; **Morris A. Ransone,** Tetra Tech, Inc., chairman, Washington Section MTS, **Robert J. Scott,** Gibbs & Cox, Inc., chairman, Chesapeake Section, SNAME; **James W. Curlin,** Deputy Assistant Secretary for Land and Water Resources, U.S. Department of the Interior; and Andreas **B. Rechnitzer,** Office of the Oceanographer of the Navy.

A joint meeting was held in November at the Fort Meyer Officers' Club by the Chesapeake Section of The Society of Naval Architects and Marine Engineers and the Washington, D.C. Section of the Marine Technology Society. The paper, the National Science Foundation Drilling Programs—A Status Report, by **Wilbur G. Sherwood, Peter E. Wilkniss** and **Archie McLerran,** all of the National Science Foundation (NSF), provided a subject that appealed to the similar, yet also diverse, interests of both organizations.

The presentation by Mr. **Sherwood** began with a brief history of the National Science Foundation's Deep Sea Drilling Program, which began in 1961 when the CUSS I drilling platform undertook nine days of drilling in 3,240 feet of water off LaJolla, Calif. The program continued on using more capable platforms and culminated in the use of the drillship Glomar Challenger, which is now obtaining deep ocean sediment samples off the Southeast Coast of the United States.

During the past 19 years, the Deep Sea Drilling Project has added materially to our under-

standing of the earth's crust, including data leading to the development of the plate tectonics model. In addition, significant technical advances in offshore drilling, such as dynamic positioning, satellite navigation, sonar drill hole re-entry techniques, improved core bits and equipment, and improved coring techniques are now being used by the offshore oil drilling and mining industry. Other recent developments include the ability to run intermediate casings in deep water (18,000 feet or greater), successful fishing and recovery of a drill string in 18,000 feet of water, improved deepwater drill string designs, and the development of instruments capable of obtaining data from deep holes.

The limitations of the Glomar Challenger have led to the need for a more capable platform to support a major new initiative, the Ocean Margin Drilling Project, which entails drilling in 13,000 feet of water to depths of 20,000 feet below the subsea bottom. This effort will be jointly funded by the U.S. Government and the oil industry, and primary emphasis will be placed on increasing basic scientific knowledge about the passive ocean margins where thick sediments exist and sophisticated well control techniques and blowout prevention are required.

It is intended to use the Government-owned Glomar Explorer for this program because of its seakeeping and stability characteristics, deadweight capacity, available volume for laboratories, and precise stationkeeping system. To date, a baseline conceptual design has been completed and NSF intends to complete an updated Baseline Design, including trade-off studies, and to issue a request for proposals for a program systems integration contractor in Fiscal Year 1981.

New Firm Will Provide Skilled Workers For Building & Repair Yards

The Consolidated Industrial Skills Corporation (CISCO) has been formed to supplement companies with skilled, first-class labor. Currently, CISCO is servicing major shipbuilding concerns in the Gulf and East Coasts with pipefitters, shipfitters, machinists, and electricians on an as-needed basis.

With the nationwide supply of qualified tradespeople in great demand, CISCO's program helps its customers satisfy their present production needs, enabling them to bid additional work.

CISCO's principal officers, **Mack E. Reifers** and **Christopher S. Gallo,** have serviced shipbuilding and repair companies with skilled manpower numbering up to 600 craftspeople. The firm has offices in Jacksonville and New Orleans. The Florida address is P.O. Box 24470, Jacksonville, Fla. 32217; (904) 399-1802.

Skinner To Produce Steam Engines In New Larger Capacities

The oldest manufacturer of steam engines still operating in this country has announced an extension of the sizes available for both marine and stationary use. Skinner Engine Company of Erie, Pa., said that effective immediately the Skinner Marine Unaflow steam engines will be available in capacities from 400 to 15,000 horsepower. The stationary or industrial models of the "Universal Unaflow" engines are available in various capacities to 10,000 horsepower.

R. Dennis Whiting, company vice president, said that growing interest in steam engines for marine propulsion and electrical generation prompted the company to expand its line. Mr. **Whiting** said that even larger sizes would be produced on special order after consultation on the proposed application.

Stationary models of the steam engines are used to generate electricity, drive compressors and pumps, and supply power for a wide range of manufacturing processes.

For additional information on Skinner reciprocating steam engines,
Write 42 on Reader Service Card

$1.2-Million Navy Contract For Communications Buoy Awarded To Hazeltine

Hazeltine Corporation, Commack, N.Y., has announced the receipt of a $1.2-million U.S. Navy contract from Naval Sea Systems Command for the development of a digitally programmable communications buoy and buoy interface unit for use in submarine communications via satellite. The system, once developed, will be considered for installation on all SSN United States submarines.

This contract will permit Hazeltine, a leader in advanced sonobuoy technology and design, to apply and extend that technology in development of a new submarine communications system. System design and development will be performed primarily by the staff of Hazeltine's Anti-Submarine Warfare facility in Braintree, Mass. Analysis and design support will be provided by Hazeltine's Research Laboratories and Electronic Identification Product Line.

New Brochure On Hoists And Winches Available From Joy Manufacturing

A new 16-page brochure describing its complete line of air hoists and utility winches is now available from the Joy Manufacturing Company.

Air hoists and utility winches are widely used in industry and mining. They have no spark or shock hazards and work in extreme temperatures. Typical uses are oil drilling platforms, refineries, construction sites, mines, and various marine applications.

The brochure includes a Hoists Selector Chart as well as a full page devoted to each model or model family. The page covers hoist dimensions, foundation dimensions, general specifications, and performance curves for the hoist at "full drum," "½ drum," and "first turn on drum."

For copies of the brochure, designated B1530,

Write 39 on Reader Service Card

$10.4-Million U.S. Navy Overhaul Contract Awarded To General Ship

General Ship Corporation of East Boston, Mass., has been awarded a U.S. Navy contract in the amount of $10,437,420 for regular overhaul of the destroyer USS Mullinnix (DD-944).

Under the new contract, the Mullinnix will arrive in the yard in February 1981 for a 10-month overhaul. General Ship is now completing overhaul work on the destroyer USS Edson (DD-946), which will be delivered to the Navy within the original contract schedule period.

Contracting activity was the Supervisor of Shipbuilding, Conversion and Repair, USN, East Boston. (N62665-79-C-0004)

New Ultrasonic Liquid Level Control System Introduced By Inventron

Inventron Industries Inc. of Klamath Falls, Ore., has introduced a microprocessor-based level control system dedicated to pump control. The new system, named the LS-99, uses ultrasonic transducers to detect product level in tanks and other vessels.

Among the key features of the LS-99 is an array of front panel controls that permit the user to perform all start-up and calibration routines without opening the controller cabinet. The standard configuration of the LS-99 is designed to handle single and duplex pump stations, but as many as eight pumps can be controlled. The controller for the LS-99 can be purchased without an ultrasonic control card, and thus can be used to control the 4-20 mA signal of essentially any type of level-control device.

Lead and lag pump capability is included, and four thumbwheel switches on the front panel permit easy and fast changes in settings. Optional high and low alarms can be included if desired. Analog voltage outputs are included, and optional current outputs are available with the system.

For additional information on the Inventron Industries LS-99,

Write 40 on Reader Service Card

New Watch Receiver Announced By DEBEG— Literature Available

DEBEG Marine, Inc., Tewksbury, Mass., has announced availability of its new Model 2340 watch receiver. The receiver was designed to conform to SOLAS regulations and the requirement that all vessels over 300 gross tons will be equipped with a watch receiver by March 31, 1981. According to the company the unit has been successfully proven on hundreds of oceangoing vessels, having already met all of the required European standards. FCC approval is pending.

The DEBEG 2340 RT watch receiver auto alarm provides permanent watch-keeping on the international distress frequency, 2,182 kHz. Three operational modes are push button selectable. When in mute mode, the receiver is in operation but AF signals are inaudible. In the 2-tone filter mode, only the 1,300 Hz and/or 2,200 Hz are audible. In the normal mode, all AF signals are audible.

In the mute mode, the receiver will automatically switch over to normal on reception of the international radiotelephone alarm signal, the navigational warning signal, or the EPIRB signal. The automatic switchover from mute or 2-tone filter modes with external signaling is achieved by special logic selector circuits. An optional clock is available to switch from mute mode to normal during the silence periods.

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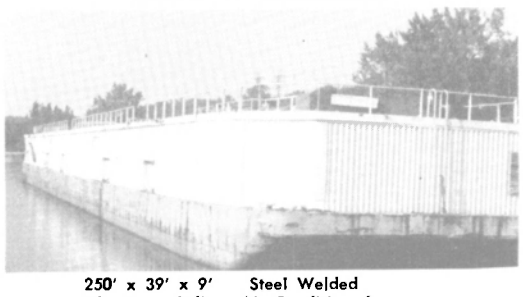

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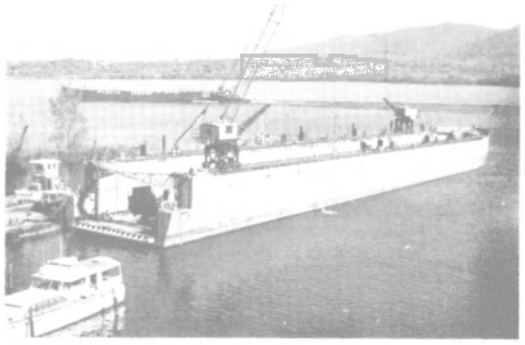

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TWO ROLL ON/ROLL OFF LANDING SHIPS 200' x 34', LIGHT DRAFT 3' FWD 5' AFT, ENGINES, GENERATORS AND ALL MACHINERY OPERATIVE. HAS 8000 CU.FT. OF REEFER AND CAN HANDLE LIQUID PETROLEUM PRODUCTS IN ADDITION TO GENERAL CARGO. LOCATED MIAMI. ALSO SPARE PARTS FOR THE ENGINES AND OTHER MECHANICAL EQUIPMENT VALUED IN EXCESS OF $50,000 WILL BE PROVIDED WITH EACH SHIP SOLD. PANAMANIAN REGISTRY. WRITE OR CALL DUBBIN, CANAVERAL INT'L CORP., 7100 BISCAYNE BLVD., MIAMI, FLA. 33138 — 800-327-8435 OR 305-759-2441.

FOR SALE BY OWNER

Landing Craft & Towing Vessel — 125' x 34' x 10'. Excellent condition. Main Eng. V-12 71 6:1 Twin Disc. (2) Gen. Sets 50 & 100 KW. Towing Winch — Hyd. Deck Crane — G.T. 149 (2) Radars — SSB. Auto Pilot — Gyro Loran. Ramp Opening 15' Vessel Equipped to haul 5 Refer Vans.
Call Jacobson 206 782-1618

FOR SALE
NEW UNUSED
1500 HP REDUCTION GEARS
6.75 : 1
PORT AND STARBOARD

Mfg. Farrell Birmingham
Input RPM 1011/1350
Output RPM 150/200

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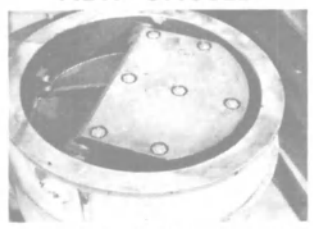
FOR SALE
24" AND 30" VALVES
SWING CHECK
NEW-UNUSED



150 lb. cast steel, stainless steel trim. ABS & Coast Guard approved. Mfg. in 1975 by U.S. Manufacturer. Substantial savings.

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FOR SALE
NEW UNUSED
DEEP WELL PUMPS
Mfg Johnston Pump Co. 1974

200 GPM 239'TDH 6 stage
Column length 58'6" requires 75HP

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FOR SALE
NEW — UNUSED

4—**BUTTERWORTH HEATERS** 850 Sq. Ft.
90/10 cuni tubes 180psi steam
75/210° sea water

3—**FW/SW HEAT EXCHANGER** 1686 Sq. Ft.
90/10 cuni tubes 113/90° fresh water

8—**FUEL OIL HEATERS** 90 Sq. Ft.
125psi steam 400psi design pressure

8—**CONTAMINATED DRAIN COOLERS**
83 Sq. Ft. 150 psi design 250/95° out

All above ABS and Coast Guard approved manufactured by American Standard 1974 for San Clemente T8-S-100B Class Tankers. Complete specifications & drawings available.

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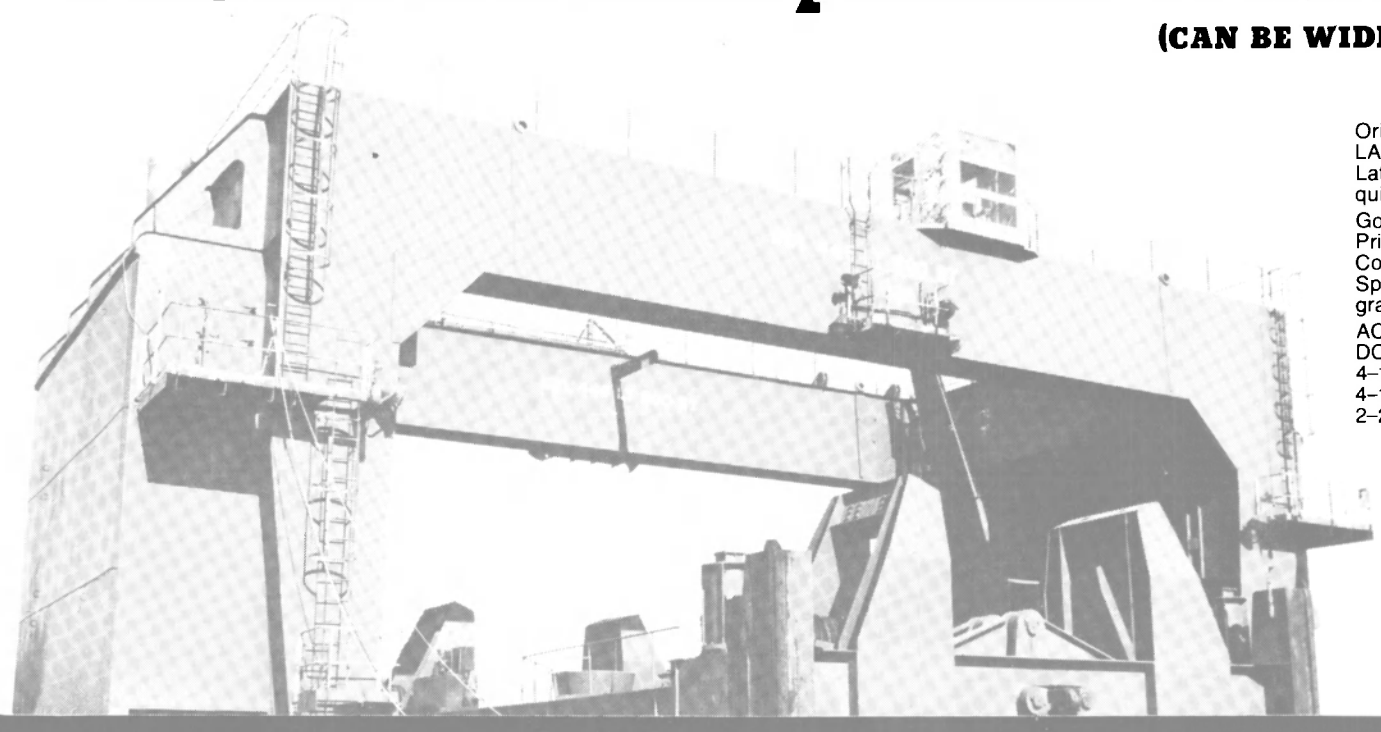
For Sale at Zidell

AVAILABLE NOW FOR IMMEDIATE SHIPMENT

Two 500-ton Gantry Cranes — 70-foot Track Span

(CAN BE WIDENED TO 100 FEET)



Originally Barge Handling. As used on LASH Ships. Manufactured by Alliance. Late Model built to ABS and MARAD requirements.

Good Condition. Immediately Available. Priced at a fraction of New Replacement Cost. Complete with Lifting Beams and Spreader Beams (not shown in photograph)

AC Power Input Through Cable Reel
DC Hoist & Gantry Motors & Controls
4–150 HP–240 Volt DC Hoist Motors
4–150 HP–240 Volt DC Gantry Motors
2–265 KW–500 Volt DC M-G Sets

Units Can Be Modified

Possible other uses:
1) Moving heavy equipment
2) Dam Sites
3) Concrete Prefab plants
4) Railroad yards
5) Steel plants

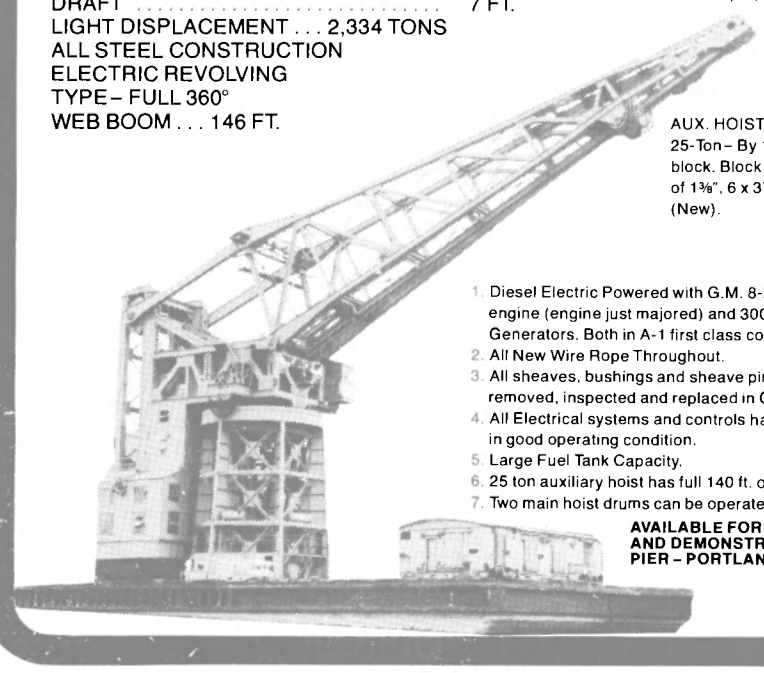
Geared Track is also available at extra cost

200 TON/DIESEL ELECTRIC Floating Crane

FOR SALE – RENT– CHARTER

LENGTH OVERALL ..... 140 FT.
BEAM ..... 84 FT.
DRAFT ..... 7 FT.
LIGHT DISPLACEMENT . . . 2,334 TONS
ALL STEEL CONSTRUCTION
ELECTRIC REVOLVING
TYPE – FULL 360°
WEB BOOM . . . 146 FT.

MAIN HOIST:
200-Ton – By 2 only, 8 part blocks. Each block carries 2,050 ft. of 1½". 6 x 37 I.P.S. wire rope (New).



AUX. HOIST:
25-Ton – By 1 only 4 part block. Block carries 1,110 ft. of 1⅜", 6 x 37 I.P.S. wire rope (New).

1. Diesel Electric Powered with G.M. 8-278A diesel engine (engine just majored) and 300 KW, 230 volt Generators. Both in A-1 first class condition.
2. All New Wire Rope Throughout.
3. All sheaves, bushings and sheave pins have been removed, inspected and replaced in Good Condition.
4. All Electrical systems and controls have been placed in good operating condition.
5. Large Fuel Tank Capacity.
6. 25 ton auxiliary hoist has full 140 ft. of boom travel.
7. Two main hoist drums can be operated independently.

AVAILABLE FOR INSPECTION AND DEMONSTRATION AT OUR PIER – PORTLAND, OREGON

FOUR 30-TON Container Cranes

70-foot Track Span

NEW 1970-72

Priced at a fraction of today's new replacement cost. Good Condition. Immediately Available. From LASH Ships. Late Model. Manufactured by PACEO. Suitable for Ship, Barge or Land Use. Manufactured to ABS and MARAD requirements.

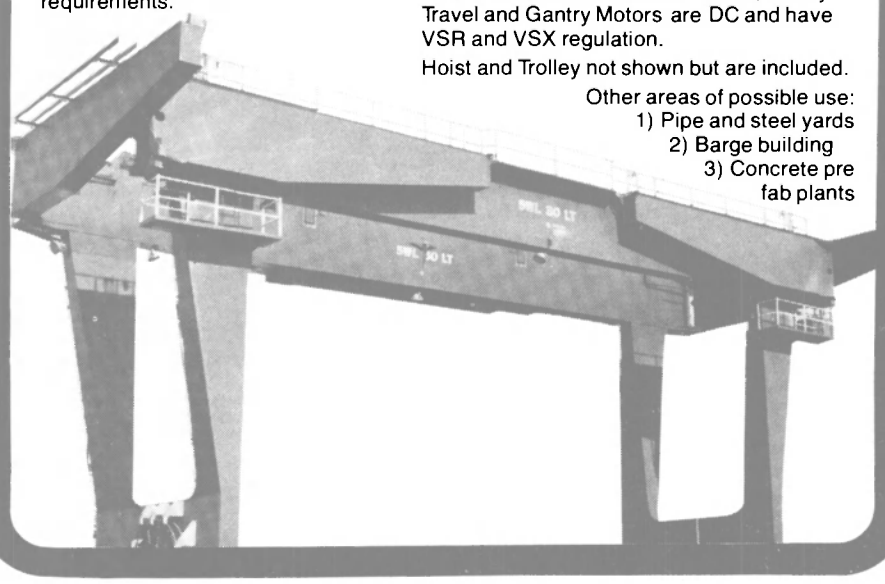
AC Power Input with Cable Reel and 350 feet of 500 MCM Cable.

MG set: 250 HP-AC-170 KW 230 DC.

• 200 HP DC Hoist Motor • 100 HP DC Trolley Motor • 2-40 HP DC Gantry Travel Motors • Trolley Travel 275 F.P.M. • Gantry Travel 100 F.P.M. • Hoist Speed: 30 LT @ 85 F.P.M.; 20 LT @ 100 F.P.M.; Empty Spreader 200 F.P.M. • 32'0" Maximum Outstretch • Hoist, Trolley Travel and Gantry Motors are DC and have VSR and VSX regulation.

Hoist and Trolley not shown but are included.

Other areas of possible use:
1) Pipe and steel yards
2) Barge building
3) Concrete pre fab plants



For additional information, brochures or inspection, contact: Hugh Sturdivant, Sales Manager, or A.D. Canulette, Jr.

ZIDELL

ZIDELL EXPLORATIONS, INC.

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Phone: (503) 228-8691 • Telex 36-0503 • Cable "Zidell"

SHIP LAY-UP FACILITIES
TENSAW RIVER DOCK & STORAGE YARD
UP RIVER FROM MOBILE, ALABAMA
FORMERLY U.S. GOVERNMENT RESERVE FLEET
FRESH WATER ANCHORING
440 A/C — FIRE PROTECTION — SECURE AREA
16 Ft. Drafts
CALL FOR RATES
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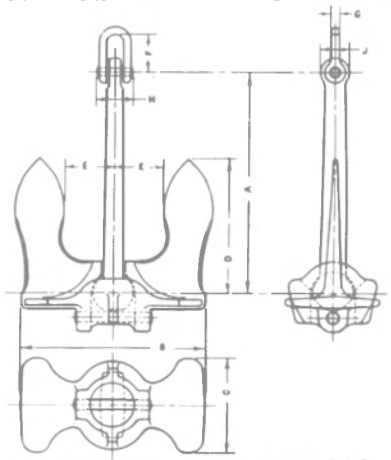
ANCHORS — CHAIN

DETACHABLE LINKS
PEAR-SHAPED DETACHABLE LINKS



LARGE BALDT-TYPE ANCHORS
16000 LBS/12000 LBS/8000 LBS/3000 LBS

10 EA. 5" x 15" I.D. STEEL RINGS
3 EA. R.P. ANCHOR SHAX 3⅞ STK, 3⅞ PIN

NEW CHAIN
10 X 90 Ft. 3" DILOK CHAIN — ABS
9 X 90 Ft. 2" DILOK CHAIN — ABS

NEW SWIVELS
3 EA. 2 5/16 — 3" E&E SWIVELS
13 EA. 3⅛ DETACHABLE LINKS

PEARSHAPED DETACHABLE LINKS
25 EA. #7 — 17 EA. #5

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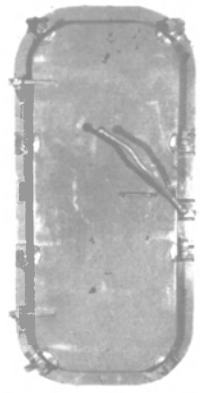
ANKER MARINE PAINTS

WORLD WIDE DISTRIBUTION



QUICK-ACTING LEVER OPERATED WATERTITE DOORS
26" X 66"
8-DOG
Rights & Lefts

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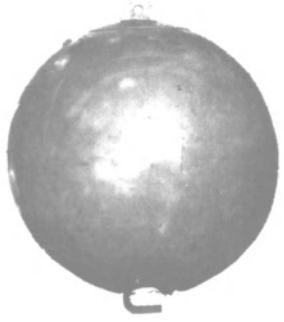

NEW — UNUSED SPHERICAL
MOORING BUOYS

About 58" diam. With tieplates top & bottom. Est. wt 680 lbs each. 120 lbs submergence

CYLINDRICAL BUOYS

3 Available — 5 ft X 9 ft — with wood bumpers

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15½" & 16" CLEAN BRASS 4-DOG MARINE
PORTLIGHTS
15½" CLEAR OPENING
16" CLEAR OPENING

Recently carefully hand removed from ocean vessels. Suitable for re-use on shipyard conversions or for marine ornamental use. Heavy marine standard glass . . . clear or can be furnished frosted for use in special locations.

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250KW GM 12-V-71 DIESEL GENERATOR SETS

440/3/60/1800 — with free-standing switchgear. Generators manufactured by Electric Machinery Co. — E.M. Bemac — brushless — synchronized — keel cooled.

CAN BE SEEN ABOARD ALCOA "SEAPROBE"

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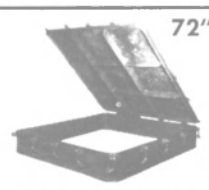
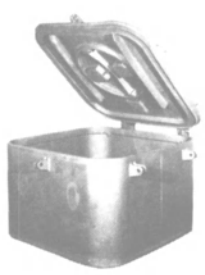
HATCHES, HATCHES and MORE HATCHES. WE'VE GOT' EM!

24" X 24" X 10"
4-DOG



72" X 72" X 12"
16-DOG

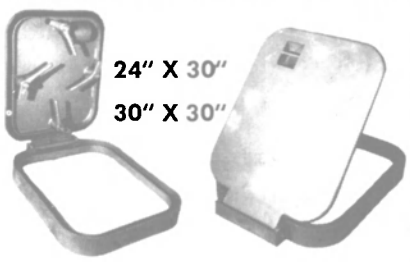


36" X 36" X 24"
WITH 19" CIRCULAR STEEL MANHOLE IN COVER

NEW UNUSED FLUSH HATCHES

54" X 66"
54' X 77"

14-Dog — operated from top side by T-key, with dogs marked to show open & closed positions.



24" X 30"
30" X 30"

4 Dogs on underside—topside flush, with T-Key openers.

18" DIAM X 10" SCUTTLE

60" X 42" X 12" 10-DOG

20" DIAM X 4" SPRING LOADED 4-DOG

42" X 42" X 9" 7-DOG SPRING LOADED

24" X 24" ROUND QUICK-ACTING 4-DOG SCUTTLE

36" X 26" 7-DOG TANKER EXPANSION TRUNK

THE BOSTON METALS COMPANY

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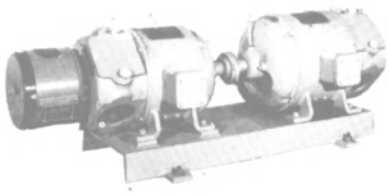
LOUIS-ALLIS M.G. SETS
2.5 KW — 115 Volts D.C. Input



2½ KW—115 volts—single phase A.C. output. GENERATOR: Type GNA—class 1G—Frame 28A—Form A—1800 RPM—5 KVA—2.5 KW 115 volts AC—60 cycle—50% PF—43.4 amps. MOTOR: Louis Allis—Type GNA—Class E—Frame 25A—Form A—1800 RPM—115 volts DC—32 amps—shunt wound (with attached Ward-Leonard speed reducer). Complete with Ward Leonard Controller S.O. 4227299—Serial No. 4227299-D12—frequency meter, volt meter, rheostat for motor and generator transfer switch.

ALSO WITH 230 VOLT D.C. MOTORS

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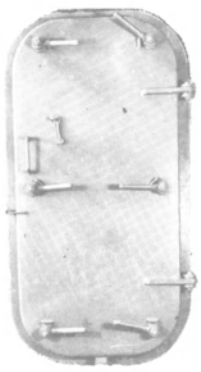
FOR SALE

NEW WATERTIGHT DOORS



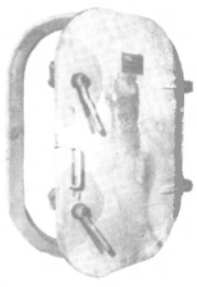
Steel Dogs

6-Dog right and left hand hinged doors with frames. Constructed of 1/4" steel plate and meet Coast Guard regulations for above deck as well as below deck use. All dogs are bronze bushed.

SIZE
26"x48" 26"x66"
26"x60" 30"x60"
EACH DOOR

IMMEDIATE DELIVERY

NEW SMALL STEEL WATERTIGHT DOORS



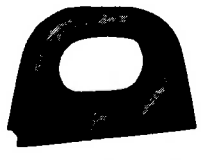
24" X 36"
2-DOGS
5 Right Hand
2 Left Hand
IMMEDIATE DELIVERY

NEW 7" RADIUS PANAMA CHOCKS

(MEET PANAMA REGULATIONS)
14" X 10" CLEAR OPENING

With extended legs for welding to deck. 14" Wide on base — length 28" — height 27¼". IMMEDIATE DELIVERY FROM STOCK.

NEW UNUSED 12"X6½" PANAMA CHOCKS FOR SMALL VESSELS



Closed chocks — 12" X 6½" inside opening — 23" overall outside — 8" high — 15" high — 7" radius — weight 110 lbs. IN STOCK.

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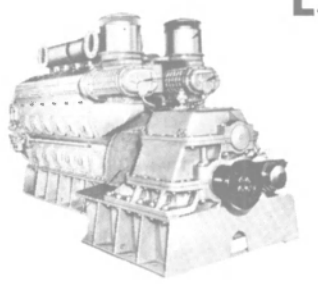
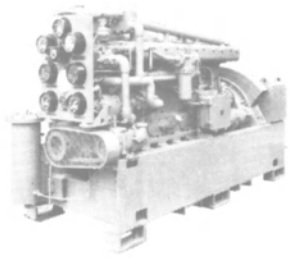
LST MACHINERY



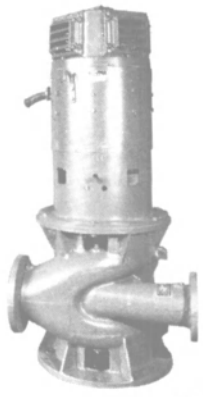
PORT & STARBOARD GM 12-567A 900 HP DIESEL ENGINES
with Falk reverse & reduction gears

ENGINE: GM 12-567A — 8½X10 — V-type — 2-cycle — 747 RPM—electric starting—serial Nos. 1041 & 1060. GEAR: Falk AirFlex — reverse & reduction — 2.48:1 forward — 2.52:1 reverse.



100KW GBD-8 DIESEL GENS.

120/240 VDC—417 amps—stab shunt—1200 RPM—Delco generator—Self-excited. ENGINE: Superior GBD-8—8-cyl—5½X7—150 HP—30 volt electric starting. Reconditioned to ABS. Dry wt. 10,000 lbs—DAL 124"—65 11/16" high—42" wide. Hgt necessary to pull piston 68". Fuel consumption 0.620 lbs/hr.

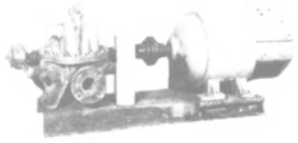


GARDNER-DENVER BALLAST PUMP

Bronze — 1500 GPM — 56' head or 25 bs — 8" suction — 6" discharge. MOTOR: Century 30 HP 230 VDC 110 amps 1750 RPM. 40°T rise — stab. shunt — ballbearing — dripproof. Controls available.

TAILSHAFTS

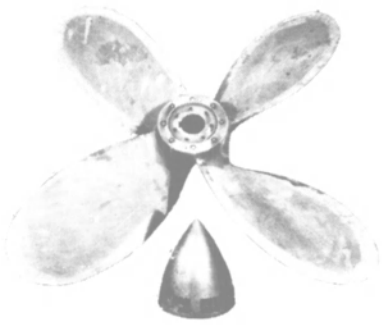
Diameter: 6 1/8" Length: 21' 2 5/8"



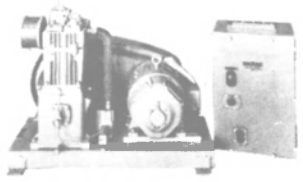
GOULD FIRE & BILGE PUMP

250 GPM & 100 lbs—4" suction—3" discharge—2200 RPM—bronze—manufactured by Gould. Direct connected to 30 HP 230 volt DC Louis-Allis motor.

4-BLADE PROPELLERS
BRONZE — PORT & STARBOARD



7' Diameter—pitch constant 4.699. Bore tapers from 6 1/8" to 4 53/64". 14½" Taper equal to 1"/foot on diameter. U.S. Navy reconditioned. Average weight 1760 lbs.



CLUTCH TIRE AIR COMPRESSOR

Model 320—4 X 2½ X 3"—10/15 CFM—100/150 PSI—700 RPM. MOTOR: 3 HP—230 volts DC—1750 RPM.

COMBINATION LUBE OIL & SALT WATER COOLING PUMPS

Model 3630—mfg by Goulds—1150 RPM. Rotary lube oil pump one end (35 GPM @ 15 PSI—1½"X1½")—salt water circulating pump other end (35 GPM @ 15 PSI—2" X 1½") G.E. Motor model 5B254A1988—type B—Frame 254—3 HP—230 VDC—11.9 amps—1150 RPM compound—Cont. 40°C temp rise. Ball bearing.

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SURPLUS BERGER FAIRLEADS

2 Model 620—for 1⅝" wire—20" sheave. Located San Francisco, Ca.

3 Model 614—for 1¼" wire—14" sheave. Located Panama City, Fla.

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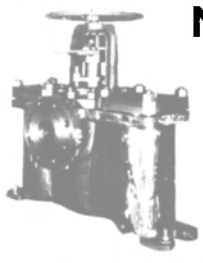
NEW–UNUSED 3" STEEL DUPLEX STRAINER



With hand wheel. Mfg. by Derbyshire. Flange to flange 14 3/8"—width 26"—center of hole to base 11". Fine steel mesh basket. Working pressure 300 lbs. 6 3/4" bolt circle with 8 bolt holes.

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York Division (Borg-Warner Corp.), P.O. Box 1592, York, PA 17405

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A.B. Murray Company, Inc., P.O. Box 476, Elizabeth, NJ 07207

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Goodyear Aerospace (Industrial Brakes Division), Box 477, Berea, KY 40403

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Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10005
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Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y., N.Y. 10019

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Colmac Coil, Inc., Colville, Wash. 99114

CONTAINERS—Cargo Container Handling
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

CONTROL SYSTEMS—Monitoring
Arnessen Marine Systems, Inc., One Battery Plaza, New York, NY 10004
Megasystems, Inc., 5909 West 130th Street, Cleveland, OH 44130
Seatronic Engineering & Mfg. Co., 1230 E. Joppa Rd., Towson, MD 21204
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
Transamerica Delaval, Inc., Gem Sensors Div., Spring Lane, Farmington, CT 06032

COUPLINGS
Bird-Johnson Co., 110 Norfolk St., Walpole, MA 02081

CRANES—HOISTS—DERRICKS—WHIRLEYS
Clyde Iron, a unit of AMCA International Corp., Suite 102, 2300 West Loop South, Houston, TX 77027
M. P. Howlett, Inc., 410 32nd St., Union City, N.J. 07037
J. D. Neuhaus, Witten-Heven, Hebezeuge, D 5810 Witten-Heven, West Germany
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

DECK MACHINERY—Cargo Handling Equipment
Appleton Machine Co., Marine Division, 618 S. Oneida St., Appleton, WI 54911
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134

DIESEL ACCESSORIES—CYLINDER LINERS
B & W Marine Service, One State Street Plaza, New York, N.Y. 10004
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, Massachusetts 02360
Golten Marine Company, Inc., 162 Van Brunt Street, Brooklyn, NY 11231
Teledyne Metal Finishers, 1725 East 27th Street, Cleveland, OH 44114
Teledyne Metal Finishers, 3125 Brinkerhoff Road, Kansas City, KS 66115
Twin Disc, Incorporated, Racine, Wis. 53403

DRAFTING EQUIPMENT
AM Bruning, 1834 Walden Office Square, Schaumburg, IL 60196

ELECTRICAL EQUIPMENT
Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013
Marine Safe Electronics of Canada Ltd., 101 Jardin Dr., Suite 24, Concord, Ontario, Canada L4K 1B6
Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014
Port Electric Supply, 157 Perry Street, N.Y., N.Y. 10014
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

EMULSIFICATION SYSTEMS
Hoffert Manufacturing Company, Inc., 1700 East Church Street, Jacksonville, FL 32202

EQUIPMENT—Marine
ATCO Marine Corp., 603 Dean Street, Brooklyn, NY 11238
Argo Marine, Div. of Argo Intl., 140 Franklin St., New York, N.Y. 10013
Baldt, Inc., P.O. Box 350, Chester, PA 19016
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, N.Y. 10550
J. H. Menge & Company, Inc., P. O. Box 23602, New Orleans, La.
Rockwell International, Power Tool Division, 400 N. Lexington Ave., Pittsburgh, PA 15208
Schnitzer-Levin Marine Co., 445 Littlefield Ave., So. San Francisco, CA 94080
Schwepper Beschlag GmbH, Postfach 101110, 5620 Velbert 1, West Germany
Sudoimport, 5 Kalyaevskaya, Moscow K-6, USSR
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wisc. 53186

EVAPORATORS
Riley-Beaird, Inc., P.O. Box 1115, Shreveport, La. 71130

EXPANDED METALS — METALS
Millard Controlled Metals, 5 Louise Drive, Ivyland, PA 18974
Washington Iron Works, 1500 Sixth Avenue South, Seattle, WA 98134

FANS—VENTILATORS—BLOWERS—HEATEXCHANGERS
Coolmar Heatexchangers B.V., P.O. Box 54156 3008 JD Rotterdam, (The Netherlands) Waalhaven Z.Z. 52
Hartzell Propeller Fan Company, 901 S. Downing Street, Piqua, OH 45356
Joy Manufacturing Co., 338 So. Broadway, New Philadelphia, Ohio 44663
Zidell Explorations, 3121 S.W. Moody St., Portland, Ore. 97201

FENDERING SYSTEMS—Dock & Vessel
Hughes Bros., Inc., 17 Battery Place, New York, N.Y. 10004
Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062
Morse Chain Company, Div. Borg Warner, So. Aurora St., Ithaca, N.Y. 14850
Seaward International, Inc., 6269 Leesburg Ave., Falls Church, Va. 22044

FINANCING—Leasing
Continental Illinois National Bank, 231 S. LaSalle, Chicago, IL 60693
General Electric Credit Corp., P.O. Box 8300, Stamford, Conn. 06904
Greyhound Leasing & Financial Co., Greyhound Tower, Phoenix, AZ 85077
Kidder, Peabody & Co., Inc., 10 Hanover Square, New York, N.Y. 10005
Salomon Brothers, One New York Plaza, New York, N.Y. 10004
Warburg Paribas Becker, Inc., 2 First National Plaza, Chicago, Ill. 60670

FITTINGS & HARDWARE
Custom Alloy, 2040 N. Loop W., Houston, TX 77018
Robvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

FURNITURE
Bailey Joiner Co., Inc., 74 Sullivan Street, Brooklyn, N.Y. 11231
IDT Corp. (Intersystems Design & Technology Corp.), P.O. Box 1590, Summerville, S.C. 29483

GANGWAYS
Rampmaster Inc., 1226 N.W. 23rd Ave., Fort Lauderdale, Fla. 33311

HATCH & DECK COVERS—Chain Pipe
Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207
Lockstad Company, Inc., R D 2 Burnett Road, Mendham, NJ 07945
MacGregor-Comarain, Inc., 135 Dermody St., Cranford, N.J. 07016
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Julius Mock & Sons, Inc., 20 Vesey St., New York, NY 10017

HULL CLEANING
Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932
Phosmarin Equipment (Phoceenne Sous-Marine S.A.), 21 Boulevard de Paris, 13002 Marseille, France
Sub Enterprises, Inc., P.O. Box 16531, Irvine, CA 92713

HYDRAULICS
Fluid Technology, Inc., 10626 Phillips Highway, Jacksonville, FL 32224
Voss, Inc., Building J, 7029 Huntley Road, Columbus, Ohio 43229

INERT GAS—Generators—Systems
ATCO Marine Corporation, 603 Dean St., Brooklyn, NY 11238
Camar Corporation, P.O. Box 460, Worcester, MA 01613
Foster Wheeler Boiler Corp., 110 So. Orange Ave., Livingston, N.J. 07039
Fredriksstad mek. Verksted, N. American Agents, American United Marine Corp., 575 Madison Ave., New York, N.Y. 10022

INFORMATION—Marine
Maritime Data Network, 300 Broad Street, Stamford, CT 06901

INSULATION—Cloth, Fiberglas
Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Dupont Company, Nemours Bldg.-RM C31H6, Centre Rd. Bldg., Wilmington, DE 19898
IDT Corp. (Intersystems Design & Technology Corp.), P.O. Box 1590, Summerville, S.C. 29483

INSURANCE
Adams & Porter, 1819 St. James Place, Houston, Texas 77027
Adams & Porter, 5 World Trade Center, Suite 6433, New York, N.Y. 10048
Alexander & Alexander, Inc., 1185 Ave. of the Americas, New York, N.Y. 10036
B.R.I. Coverage Corporation, 156 Williams St., New York, NY 10038
Midland Insurance Co., 160 Water St., New York, N.Y. 10038
Whitehall Brokerage, Inc., 685 3rd Ave., New York, NY 10017

JOINER—Watertight Doors—Paneling
Masonite Commercial Division, Dover, OH 44622
Walz & Krenzer, Inc., 400 Trabold Road, Rochester, NY 14624

KEEL COOLERS
Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

LADDERS
Duo-Safety Ladder Co., 513 West 9th Ave., P.O. Box 497, Oshkosh, Wisc. 54901

LIFEBOATS & DAVITS
Schat Davit Corporation, 226 West Park Place, Newark, DE 19711

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
ACR Electronics, Inc., 10-99 3901 North 29th Avenue, Hollywood, FL 33020
Oceanic Electrical Mfg. Co., 157 Perry Street, New York, N.Y. 10014
Oreck Corp., 100 Plantation Rd., New Orleans, LA 70123
Perko Inc., P.O. Box 6400D, Miami, Florida 33164
Phoenix Products Company, 4785 North 27th Street, Milwaukee, WI 53209
Port Electric Supply Corp., 157 Perry Street, New York, N.Y. 10014

LNG CONTAINMENT
McDonnell Douglas Astronautics Co., 5301 Bolsa Ave., Huntington Beach, CA 92647

LUMBER
R.N. Templeman, Inc., 3000 Perdido St., New Orleans, LA 70119

MACHINE TOOLS
Climax Manufacturing Company, P.O. Box 230, Newberg, OR 97132
Master Machine Tools, Inc., 1300 East Avenue A, Hutchinson, Kansas 67501
Republic-Lagun Machine Tool Co., 1000 E. Carson St., Carson, CA 90749

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
A.L. Burbank & Co., Ltd., Marine Thermotest Dept., One World Trade Center, Suite 2811, New York, NY 10048
General Electric Company — Bldg. 2, Rm 216, Schenectady, N.Y. 12345
Schnitzer-Levin Marine Co., 445 Littlefield Ave., So. San Francisco, CA 94080

MOORING SYSTEMS
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., Suite 500, 2341 Jefferson Davis Highway, Arlington, Va. 22202
Agemar, Avenida 3E No. 71-51, Edif. Acuario (Planta Baja) Apartado 1465, Maracaibo, Venezuela
American Standards Testing Bureau, Inc., 40 Water Street, New York, N.Y. 10004
Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, Md. 20015
Del Breit Inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
C.D.I. Marine Co., Regency East, Suite 222, 9951 Atlantic Blvd., Jacksonville, Florida 32211
CTS & Associates, 11320 S.W. 108 Court, Miami, Fla. 33176
CADCOM, 107 Ridgely Ave., Annapolis, MD 21401
Childs Engineering Corp., Box 333, Medfield, Mass. 02052
John P. Colletti & Associates, P.O. Box 13378, Pittsburgh, PA 15243
Columbia-Sentinel Engineers Western, Inc., P.O. Box 21542, Seattle, WA 98111
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, Mass. 02026
Crane Consultants Inc., 15301 1st Ave., So. Seattle, Washington 98148
C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048
Norman N. DeJong & Associates, Inc., 1734 Emerson St., Jacksonville, Fla. 32207
Design Associates, Inc., 3309 Tulane Ave., New Orleans, La. 70119
Designers & Planners, Inc., 82 Beaver Street, New York, NY 10005
Donhaiser Marine, Inc., 11511 Katy Freeway, Houston, TX 77079
Parker C. Emerson & Associates, 17935 Cardinal Drive, Lake Oswego, Oregon 97034
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, N.Y. 11050
Friede and Goldman, Ltd., 225 Baronne St., New Orleans, La. 70112
Giannotti & Associates, Inc., 703 Giddings Ave., Suite U-3, Annapolis, MD 21401
Gibbs & Cox, Inc., 40 Rector Street, New York, N.Y. 10006
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110
The Glosten Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104
Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107
Hampton Roads Engineering, Inc., 119 E. Little Creek Rd., Norfolk, VA 23505
J.J. Henry Co., Inc., Two World Trade Center—Suite 9528, New York, N.Y. 10048
Hydronautics, Incorporated, 7210 Pindell School Road, Howard County, Laurel, Maryland 20810
Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, Md. 21227
James S. Krogen & Co., Inc., 3333 Rice St., Miami, Fla. 33133
Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460
Lucander Designs, P.O. Box 711, San Perlita, TX 78590
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048
MacLear & Harris, Inc., 28 West 44 Street, New York, N.Y. 10036
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, N.Y. 11746
Marine Technical Associates, Inc., 195 Paterson Avenue, Little Falls, NJ 07424
Maritime Service Company, 1357 Rosecrans St., Suite B, San Diego, CA 92106
Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225
Mechanical Resources Inc., 191 Cambridge Avenue, Jersey City, N.J. 07307
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Metritape, Inc., 33 Bradford Street, Concord, MA 01742
NKF Engineering Assoc., Inc., 8150 Leesburg Pike, Vienna, VA 22202
Nelson & Associates, Inc., 1405 N.W. 167th Street, Miami, FL 33169
Nickum & Spaulding Associates, Inc., 911 Western Ave., Seattle, WA 98104
Robert B. Niederberger, P.E., 507 Evergreen Road, Severna Park, MD 21146
Norgaard and Clark, 114 Sansome St., San Francisco, CA 94104
Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, La. 70114
Offshore Power Systems, 8000 Arlington Expressway, Jacksonville, FL 32211
PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117
Pacific Industries Inc., 1440 Canal Street, Suite 1915, New Orleans, LA 70112
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156
S.L. Petchul, Inc., 1380 SW 57th Ave., Fort Lauderdale, Fla. 33317
Pilotage Consultants, Inc., P.O. Box 3, Atlantic Highlands, NJ 07716
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 657 Mission St., San Francisco, Calif.
Sargent & Herkes, Inc., 611 Gravier St., New Orleans, La. 70130
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida 33316
Seacor Systems Engineering Associates, Corp., P.O. Box 2030, 19 Cherry Hill Industrial Park, Perina Blvd., Cherry Hill, NJ 08003
Seawortl. Systems, 36 Main Street, Essex, CT 06426
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007
T. W. Speetgens, 156 West 8th Ave., Vancouver, Canada V5Y 1N2
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
Richard R. Taubler Inc., 8 Columbia St., Milford, Del. 19963
Thames Engineering Consultants Inc., P.O. Box 589, New London, Ct. 06320
Timsco, 622 Azalea Road, Mobile, AL 36609
Corning Townsend III, 18 Church St., Georgetown, CT 06829
Undersea Systems, 112 W. Main St., Bay Shore, N.Y. 11706
Wesley D. Wheeler Assoc., Ltd., 104 E. 40th St., Suite 206, New York, NY 10016
Thomas B. Wilson, 920 North Avalon Blvd., Wilmington, CA 90744
Wind Ship Development Corporation, 690 Main Street, Norwell, MA 02061
Wink Incorporated, 8020 Mayo Blvd., New Orleans, LA 70126
XPLO Corporation, 229 Fifth Street, Gretna, LA 70053

NAVIGATION & COMMUNICATIONS EQUIPMENT
American Hydromath Co., Buckwheat Bridge Rd., Germantown, N.Y. 12526
Collins Marine Corp., Pier 32, San Francisco, CA 94105
Communication Associates, Inc., 200 McKay Road, Huntington Station, N.Y. 11746
Comsat General Corp., 950 L'Enfant Plaza, S.W., Washington, D.C. 20024
Dantronics Company, P.O. Box 204, Boca Raton, FL 33432
Electro-Nav Inc., 840 Bond Street, Elizabeth, NJ 07201
EPSCO, Inc., 411 Providence Highway, Westwood, Mass. 02090
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
Griffith Marine Navigation, Inc., 134 North Avenue, New Rochelle, NY 10801
Harris Communications, RF Communications Division, 1680 University Avenue, Rochester, NY 14610
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Decca Marine, U.S. Route 1 & St. Joe Rd., P.O. Box G, Palm Coast, FL 32037
ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611
Intermarine Electronics, Inc., Flowerfield Bldg. #7, St. James, N.Y. 11780
Iotron Corp., 5 Alfred Circle, Bedford, MA 01730
Krupp Atlas-Elektronik, 241 Erie Street, Jersey City, NJ 07302
Maritel, Inc., 139 Old Solomon's Island Road, Annapolis, MD 21401
Nav-Com, Inc., 711 Grand Blvd., Deer Park, NY 11729
Navidyne Corp., 11824 Fishing Point Drive, Newport News, VA 23606

Navigation Communications Systems, Inc., 20100 Plummer Street, Chatsworth, CA 91311
North American Philips Communication Corp., 91 Mckee Road, Mahwah, N.J. 07430
RCA Service Co., Building 204-2, Camden, N.J. 08101
Radar Devices, Inc., 2955 Merced Street, San Leandro, CA 94577
Raytheon Marine Co., 676 Island Pond Road, Manchester, N.H. 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Rockwell International, Collins Telecommunications Products Division, Cedar Rapids, IA 52405
Simrad Inc., 1 Labriola Court, Armonk, N.Y. 10504
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.
Texas Instruments Inc., P.O. Box 226030, M/S 3107, Dallas, TX 75265
Tracor, Inc., Industrial Products Div., 6500 Tracor Lane, Austin, Texas 78721

OILS—Marine—Additives
B. P. Marine North America Trading, Plaza 9, 900 Route 9, Woodbridge, NJ 07095
Ferrous Corporation, P.O. Box 1764, Bellevue, WA 98009
Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019
Houston Marine Services, Inc., First State Tower, Suite 509, Houston, TX 77015
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
Mobil Oil Corporation, 150 East 42nd St., New York, N.Y. 10017
Texaco, Inc. (International Marine), 135 East 42nd St., N.Y., N.Y. 10017

OIL/WATER SEPARATORS
Alfa-Laval, Inc., 2115 Lindwood Avenue, Ft. Lee, NJ 07024
Butterworth Systems Inc., 224 Park Ave., Florham Park, N.J. 07932
Sigma Treatment Systems, 603 Dean St., Brooklyn, NY 11238

PAINTS—COATINGS—CORROSION CONTROL
Belzona Molecular Metalife Inc., 224 7th Street, Garden City, NY 11530
"CONSOL" manufactured by Hanline Bros., Inc., 1400 Warner St., Baltimore, MD 21230
Devoe Marine Coatings Co., P.O. Box 7600 Louisville, KY 40207
Eureka Chemical Company, 234 Lawrence Ave., So. San Francisco, CA 94030
International Paint Co., 17 Battery Place North, Suite 1150, New York, N.Y. 10004
Jotun-Baltimore Copper Paint Co., 501 Key Highway, Baltimore, MD 21230
Mobil Chemical Co., Maintenance & Marine Coatings Dept., P.O. Box 250, Edison, N.J. 08817
The Skybryte Co., 3125 Perkins Ave., Cleveland, OH 44114

PETROLEUM SUPPLIES
Houston Marine Services, Inc., First State Tower, Suite 509, Houston, TX 77015
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002

PIPE—HOSE—Cargo Transfer, Clamps, Couplings
Camlock Flange Sales Corp., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696
CUNICO Corp., Cooney Pipe & Copper Works Div., 214 N. Hawaiian Ave., Wilmington, CA 90748
Hydro-Craft, Inc., 4223 Edgeland, Royal Oak, Mich. 48073
Kubota Ltd., 2-47, Shikit Suhigashi 1-Chome, Naniwa-Ku, Osaka 556-91, Japan
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

PLASTICS—Marine Applications
Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines
Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
Alsthom-Atlantique, 2 quai de Seine, 93203 Saint-Denis, France
Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Burmeister & Wain Diesel, Inc., 50 Broadway, New York, NY 10004
Caterpillar Tractor Company, Engine Division, Peoria, IL 61629
Colt Industries' Fairbanks Morse Engine Division, Beloit, Wisc. 53511
Combustion Engineering, Inc., Windsor, Connecticut 06095
Electro-Motive Division, General Motors Corp., LaGrange, Ill. 60525
Elliott Company, (Div. of Carrier Corp.), Jeanette, PA 15644
General Electric Co., Diesel Power Products, 2901 E. Lake Rd., Erie, PA 16531
MTU of North America, Inc., 10450 Corporate Drive, Sugar Land, TX 77478
Maritime Industries, Ltd., 6307 Laurel St., Burnaby, B.C. Canada V5B 3B3
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
Motive Power Corp., P.O. Box 365, Mineola, NY 11501 70124
Omnithruster Inc., 15418 Cornet Ave., Santa Fe Springs, CA 90670
Oosterhuis Industries, P.O. Box 30587, New Orleans, LA 70190
Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014
Propulsion Systems Inc., 21213 76th Ave., So., Kent, WA 98031
Schottel of America, Inc., 8375 N.W. 56 Street, Miami, Fla. 33166
Skinner Engine Company, P.O. Box 1149, Erie, PA 16512
Steamco Corporation, 364 Stowe Avenue, Orange Park, FL 32073
Tacoma Boatbuilding Co./Escher Wyss, 1840 Marine View Dr., Tacoma, WA 98422
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, N.J. 08650
Turbine Specialties, Inc., P. O. Box 207, West State Street Road, Salina, KS 67401
Voith Schneider of America—U.S. Agent: Eli Sharprut, 347 Evelyn St., Paramis, N.J. 07652

PUMPS—Repairs—Drives
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030
Transamerica Delaval, IMO Pump Division, P.O. Box 447, Monroe, NC 28110
Warren Pumps, Inc., Bridges Ave., Warren, Mass. 01083

REFRIGERATION—Refrigerant Valves
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Port Refrigeration Div., 157 Perry Street, New York, N.Y. 10014

ROPE—Manila—Nylon—Hawsers—Fibers
American Mfg. Co., Inc., Willow Avenue, Honesdale, Pa. 18431
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110
Tubbs Cordage Company, Orange, CA 92668

RUDDER ANGLE INDICATORS
Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

SANITATION DEVICES—Pollution Control
Argo Marine Pollution Systems Division, 140 Franklin St., New York, N.Y. 10013
Envirovac (Division of Dometic Inc.), 1260 Turret Drive, Rockford, IL 61111
Marine Moisture Control Co., Inc., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696
Marland Environmental Systems, Inc., N. Main Street, Walworth, WI 53184
Microphor, Inc., P.O. Box 490, Willits, CA 95490
Red Fox Industries, P.O. Drawer 640, New Iberia, LA 70560
Research Products/Blankenship, 2639 Andjon, Dallas, Texas 75220
St. Louis Ship FAST Sewage Systems, 611 East Marceau St., St. Louis, Mo. 63111
Sigma Treatment Systems, 2 Davis Ave., Frazer, PA 19355

SCAFFOLDING EQUIPMENT—Work Platforms
Patent Scaffolding Co., 2125 Center Ave., Fort Lee, N.J. 07024
Spider Staging Sales Co., P.O. Box 182, Renton, Washington 98055
Trus Joist Corp., P.O. Box 60, Boise, Idaho 83707

SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT
Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02031
Electric Tachometer Corp., 68th & Upland St., Philadelphia, Pa. 19142
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

SHIPBREAKING—Salvage
American Ship Dismantlers, Inc., Division of Schnitzer Industries, 3300 N.W. Yeon Avenue, Portland, Ore. 97210
The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202
Levin Metals Corporation, 1310 Canal Blvd., Richmond, CA 94807
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

SHIPBUILDING STEEL
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004

SHIPBUILDING—Repairs, Maintenance, Drydocking
A.D.M. (Amsterdam Drydock Mfg.), Maatschappij bv, P.O. Box 3036, 1003 AA, Amsterdam, Holland
AMT, Inc., 2400 N.W. 39th Avenue, Miami, FL 33142
Asmar Shipyards Co., Astilleros y Maestranzs de la Armada, Prat 856, Piso 14, Casilla 150-V, Valoariso, Chile, S.A.
Astilleros Espanoles S.A., 17 Padilla, P.O. Box 815, Madrid, Spain
Astilleros Unidos de Veracruz, S.A., San Juan de Ulua S/N, Apdo. Postal 647, Veracruz, Ver., Mexico
Avondale Shipyards, Inc., P.O. Box 52030, New Orleans, La. 70150
Bay Shipbuilding Corporation, 605 North Third Avenue, Sturgeon Bay, WI 54235
Bergeron Industries Inc., P.O. Box 38, St. Bernard, La. 70085
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004
Blount Marine Corp., P.O. Box 368, Warren, RI 02885
Boeing Marine Systems, P.O. Box 3707, Mail Stop 14-11, Seattle, WA 98124
Ira S. Bushey & Sons, Inc., 764 Court Street. Brooklyn, N.Y. 11231
Cantieri Navali Riuniti, Via Cipro, 11, 16100 Genova, Italy
Carrington Slipways Pty, Ltd., Old Punt Road, Tomago, N.S.W., Australia 2322
Centromor, One World Trade Center, Suite 3557, New York, N.Y. 10048
China Shipbuilding Corp., c/o Allegro Transportation Supply Co., One Penn Plaza, Room 1606, New York, NY 10119
Coastal Dry Dock & Repair Co., Building 131, Brooklyn Navy Yard, Brooklyn, N.Y. 11205
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Curacao Drydock Co., Inc., P.O. Box 153, Willemstad, Curacao, Netherlands Antilles
Curacao Drydock, 26 Broadway, Suite 741. New York, N.Y. 10004
Delattre-Levivier, Tour Fiat, Cedex 16, 92034 Paris La Defense, France
Dorbyl Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London Republic of South Africa
Dravo Steelship Corp., R.4, Box 167, Pine Bluff, Ark. 71602
Empressa Nacional Bazan, Paseo de la Castellana 65, Madrid 1 Spain
Equitable Shipyards, Inc., P.O. Box 8001, New Orleans, La. 70122
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, Oregon 97208
Galveston Shipbuilding Co., P.O. Drawer 2660, Galveston, TX 77553
HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219
Halifax Industries, Ltd., P.O. Box 1477, Halifax, Nova Scotia, Canada, B3K 5H7
Halter Marine, Inc., P.O. Box 29266, New Orleans, La. 70189
Havre de Grace, Havre de Grace, Md.
Hitachi Shipbuilding & Engrg. Co., Ltd., 47 Edobori 1-Chome, Nishi-Ku, Osaka, Japan
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong
Hudson Shipbuilders, Inc., P.O. Box Q, Pascagoula, MS 39567
Jackson/New York, 29 45 Richmond Terrace, Staten Island, NY 10303
Jeffboat, Inc., Jeffersonville, Ind. 47130
Keppel Shipyard Ltd., P.O. Box 2169, 325, Telok Blangah Road, Singapore 4
Kockums Shipyard, S-201, 10 Malmo 1, Sweden
Levingston Shipbuilding, P.O. Box 968, Orange, TX 77630
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134
McDermott Incorporated, 1010 Common Street, New Orleans, LA 70160
MacGregor Land & Sea, Inc., 135 Dermody Street, Cranford, NJ 07016
Mangone Shipbuilding Co., 819 South 80th Street, P.O. Box 5446, Houston, TX 77012
Marine Fabricators, P.O. Box 246, Green Cove Springs, FL 32043
Matton Shipyard Co., Inc., P.O. Box 645, Cohoes, New York 12047
Misener Industries, Inc., 5353 Tyson Avenue, P.O. Box 13625, Tampa, Fla. 33681
Mississippi Marine Towboat Corp., P.O. Box 539, Harbor Front Industrial Park, Greenville, MS 38701
Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655
Nashville Bridge Company, P.O. Box 239, Nashville, TN 37202
National Steel & Shipbuilding Corp., San Diego, Calif. 92112
Newpark Shipbuilding & Repair, P.O. Box 5426, Houston, TX 77012
Newport News Shipbuilding & Dry Dock Co., 4101 Washington Ave., Newport News, Va. 23607
North American Hydraulics, P.O. Box 278, Brampton, Ontario Canada L6V 2L1
O.A.R.N. (Officine Allestimento-Riprazioni Navi), P.O. Box 13, Genoa, Italy 16100
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501
Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, Fla. 33156
Perth Amboy Dry Dock Co., Perth Amboy, N.J. 08862
Port Allen Marine Service, Inc., P.O. Box 108, Port Allen, LA 70767
Port Houston Marine, Inc., 7220 J.W. Peavy Drive, Houston, TX 77012
Port of Portland, P.O. Box 3529. Portland, OR 97203
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22
S.E.B.N., Societa Estercizio Bacini Napoletani, Via Marinella Varco N.6 (80133) Naples, Italy
St. Louis Shipbuilding—Federal Barge, Inc., 611 East Marceau, St. Louis, Mo. 63111
STE Marie Yard & Marine, Inc., 741 East Portage Ave., Sault Ste Marie, MI 49783
Savannah Shipyard Co., P.O. Box 787, Savannah, GA 31402
Sembawang Shipyard Ltd., Sembawang, P.O. Box 3, Singapore 9175
The Service Machine Group, Inc., P.O. Box 2664, Morgan City, LA 70380
Setenave-Estaleiros Navais De Setubal, P.O. Box 135, Setubal, Portugal
Southwest Marine, Inc., P.O. Box 13308, San Diego, Ca 92113
Sudoimport, 5 Kalyaevskaya, Moscow K-6, USSR
Sun Ship Inc., Chester, PA 19013
Swiftships Inc., P.O. Box 1903, Morgan City, LA 70380
Tacoma Boatbuilding Co., Inc., 1840 Marine View Drive, Tacoma, WA 98422
Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004
Total Transportation Systems Inc., 813 Forest Dr., Newport News, VA 23606
Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 28, N5201 Oslo, Norway
Tracor Marine, P.O. Box 13107, Port Everglades, Fla. 33316
Tug Barge Systems, Inc., subsidiary of Ingram Corp., 4100 One Shell Square, New Orleans, La. 70139
Union Dry Dock & Repair Co., Foot of Pershing Road, Weehawken, N.J. 07087
Wiley Manufacturing, a unit of AMCA International Corp., P.O. Box 97, Port Deposit, MD 21904
Zigler Shipyards, P.O. Box 2607, Morgan City, La. 70380

SHIP STABILIZERS
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

SMOKE INDICATORS
Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928

STUFFING BOXES
Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

SURVEYORS AND CONSULTANTS
Francis B. Crocco, Inc., P.O. Box 1411, San Juan, Puerto Rico 00903
Hull & Cargo Surveyors, Inc., 99 John St., New York, NY 10038

TANK CLEANING
Butterworth Systems Inc., 224 Park Ave., P.O. Box 352, Florham Park, N.J. 07932
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030
Salwico, Inc., 77 River St., Hoboken, N.J. 07030

TANK LEVELING INDICATORS
Transamerica Delaval, Inc., Gem Sensors Div., Spring Lane, Farmington, CT 06032
Vu-Gage System, 150 E. 42nd St. (Room 910), New York, NY 10017
Zesco, Inc., 3131 Brian Park, Suite 1095, Houston, TX 77042

TECHNICAL MANUAL PREPARATION
Benhof, Inc., 2468 N. Jerusalem Road, N. Bellmore, NY 11710

TERMINALS—Oil-Transfer
Caicos Petroleum Services Div., Federal Chicago Corp., 2222 North Elston Avenue, Chicago, IL 60614
Delong Corp., 29 Broadway, New York, N.Y. 10006
Transportation Concepts & Techniques Inc., 1020 West Main Street, Charlottsville, VA 22903

TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.
Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002
Chotin Transportation, Inc., 580 Walnut St., Cincinnati, Ohio 45202
Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202
Henry Gillen's Sons Lighterage, 21 West Main St., Oyster Bay, N.Y. 11771
Great Lakes Towing Company, 1800 Terminal Tower, Cleveland, OH 44113
Gulf Fleet Marine Corporation, Canal Place One, Suite 2400, New Orleans, LA 70130
James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
McDonough Marine Service, P.O. Box 26206, New Orleans, La.
Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, N.Y. 10048
Suderman & Young Co., Inc., 918 World Trade Bldg., Houston, Texas 77002
Turecamo Coastal & Harbor Towing Corp., One Edgewater St., Clifton, Staten Island, N.Y. 10305

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Ship Analytics, Park Circle, Centerport, NY 11721

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SeaTec International Ltd., Blackburn Industrial Center, Gloucester, MA 01930

VALVES AND FITTINGS
Dover Corporation, Norris Division, P.O. Box 1739, Tulsa, OK 74101
Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Marland Environmental Systems Inc., N. Main St., Walworth, WI 53184
Rockwell International, Flow Control Division, 400 N. Lexington Avenue, Pittsburgh, PA 15208
Stacey Valve Co., 29 Meserole Ave., Brooklyn, N.Y. 11222
Voss, Inc., Building J, 7029 Huntley Road, Columbus, Ohio 43229
Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186
Winel of America, Inc., 16014 Cowley Road, Grafton, OH 44044

WATER PURIFIERS
Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559

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Bloom Inc., Highway 20, West Four Miles, Independence, IA 50644
Clyde Iron, a unit of AMCA International Corp., Suite 102, 2300 West Loop South, Houston, TX 77027
Gearmatic Co. Ltd., 7400 132nd Street, Surrey, B.C., Canada
Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134
Smith-Berger Manufacturing Corporation, 3236 16th Avenue S.W., Seattle, WA 98134

WINDOWS
Kearfott Marine Products, A Singer Co., 550 South Fulton Avenue, Mt. Vernon, N.Y. 10550

WIRE AND CABLE
Anixter Bros., Inc., 4711 Golf Road, One Concourse Plaza, Skokie, Illinois 60076
Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055
Seacoast Electric Supply Corp., 1505 Oliver St., Houston, TX 77007

WIRE ROPE—Slings
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., One State Street Plaza, N.Y. 10004

ZINC
Smith & McCrorken, 153 Franklin St., New York, N.Y. 10013

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U.S. SHIP CONSTRUCTION CONTRACTS

1 — MERCHANT VESSELS UNDER CONSTRUCTION OR ON ORDER AT U.S. YARDS — DECEMBER 1, 1980

Builder	Owner	Total No.	Type	Hull Nos.	Est. GT (Each)	Est. DWT (Each)	Est. HP (Each)	Est. Total Cost ($Mil.)
American Ship Building	Interlake Steamship	1	Bulk	909	32,000	59,000	D-16,000	50.0
Avondale Shipyards	American President Lines	3	Container	2329-31	40,500	30,300	D-43,200	330.0
	Suwanee River	3	Tug/Barge	2323-8	16,000	41,300	D-18,200	111.6
	Ogden Marine	2	Products	2318 19	25,000	42,000	D-15,000	100.0
	Eagle Dredging	1	Dredge	2320	4,200	4,900	D-7,500	30.0
	Corps of Engineers	1	Dredge	2322	9,900	8,000	D-10,400	67.5
	United States Trust	1	Dredge	2332	—	—	—	30.0
Bath Iron Works	Corps of Engineers	1	Dredge*	402	6,000	—	D-7,000	65.0
Bay Shipbuilding	Goodyear Steamship	1	Bulk	724	12,000	23,500	D-7,500	25.0
	Ogelbay Norton	1	Bulk	726	33,000	50,000	D-14,000	52.4
Bethlehem-Sparrows Point	Artemis Marine	1	Tug/Barge	4652	32,000	47,000	D-18,200	52.6
	First-Fifth Tug/Barge	5	Tug/Barge	4653-7	32,000	47,000	D-18,200	266.0
Equitable Shipyards	City of New York	2	Ferry	1713-14	3,000	4,200	D-7,800	30.0
General Dynamics-Quincy	Bulkfleet Marine	2	Tug/Barge	055-6	12,000	27,000	D-8,000	NA
	Coastwise Shipping	3	Tank Barge	023-5	—	—	—	NA
	New England Electric	1	Collier	—	23,500	36,000	T-12,000	60.0
Levingston Shipbuilding	Levingston Falcon I	3	Bulk	751-3	23,500	36,000	D-14,800	120.0
Mangone Shipbuilding	Sun Transport	1	Products	129	1,600	2,300	D-1,900	NA
National Steel & SB	Union Oil	3	Products	415-17	24,500	37,500	T-13,000	150.0
	American Tankships	5	Products	419-23	24,500	37,500	D-11,400	239.0
	American Trading Trans.	3	Products	424-6	27,000	44,000	D-11,400	153.0
Norfolk Shipbuilding	Corps of Engineers	1	Dredge	178	2,750	—	D-2,250	18.5
Sun Ship, Inc.	Sun Transport	2	Products	676-7	17,000	31,000	D-16,200	72.0
	Waterman Steamship	3	RO/RO-Cont.	679-80, 82	18,500	23,500	T-32,000	207.1
	Calif. & Hawaii Sugar	1	Barge	683	21,000	37,000	—	25.0
Upper Peninsula SB	State of Michigan	1/4	Tug(1)/ Barge(4)	001-5	5,400	10,000	D-8,000	35.5

* Subcontracted from Sun Ship (formerly Sun Hull No. 681).

2 — OFFSHORE DRILLING RIGS UNDER CONSTRUCTION OR ON ORDER AT U.S. YARDS — DECEMBER 1, 1980

Builder	Owner	Name	Type	Delivery
Alabama Dry Dock Mobile, Ala.	Diamond M	Diamond M. Hunter	Semisub.	12/81
Baker Marine Ingleside, Texas	Huthnance Dig.	Charger I	Jackup	6/81
	Huthnance Dlg.	Charger II	"	9/81
	Magnum Marine	Mr. Demp	"	11/81
	Magnum Marine	Robert N. Haskin	"	2/82
	Magnum Marine	Robert W. Womack	"	5/82
	Marine Drilling	J. Storm XV	"	3/81
Bethlehem Steel Beaumont, Texas	Broughton Offshore	Broughton II	Jackup	2/81
	Griffin-Alexander	Griffin-Alexander I	"	4/81
	"	Griffin-Alexander II	"	6/81
	"	Griffin-Alexander V	"	5/82
	Houtech Energy	Houtech I	"	8/81
	" "	Houtech II	"	10/81
	" "	Houtech III	"	3/82
	" "	Houtech IV	"	9/82
	Keyes Offshore	Keyes 200	"	12/80
	Marine Drilling	J. Storm XVI	"	7/81
	"	J. Storm XVII	"	9/81
	O & U Drillling	(unnamed)	"	1/82
Bethlehem Steel Sparrows Point, Md.	Griffin-Alexander	Griffin-Alexander III	Jackup	3/82
	"	Griffin-Alexander IV	"	5/82
	"	Griffin-Alexander VI	"	6/82
	"	Griffin-Alexander VII	"	9/82
	Temple Drilling	Cheyenne	"	4/82
General Dynamics Charleston, S.C.	Oil Patch Drilling	(unnamed)	Jackup	10/81
	"	(unnamed)	"	12/81
Ingalls Shipbuilding Pascagoula, Miss.	Transworld Drilling	Transworld 69	Submersible	7/81
	" "	Transworld 70	"	8/81
	" "	Transworld 72	"	12/81
	" "	Transworld 73	"	1/82
	Bonito Offshore	Bonito I	Jackup	3/82
	Chiles Drilling	Yucatan	"	9/81
	Global Marine	Glomar Main Pass I	"	11/81
	"	Glomar Main Pass II	"	1/82
	"	Glomar Main Pass III	"	3/82
	Huthnance Drilling	Vanguard I	"	7/81
	Keyes Offshore	Keyes 300	"	3/81
	" "	Keyes 301	"	5/81
	" "	Keyes 302	"	6/81
Levingston Shipbuilding Orange, Texas	Dixilyn-Field	DF-87	Jackup	4/81
	Noble Drilling	(unnamed)	"	10/81
	" "	(unnamed)	"	12/82
	Bridas S.A.P.I.C.	Rio Colorado I	"	12/80
Marathon LeTourneau Brownsville, Texas	Chiles Drilling	Seabee	Jackup	3/83
	Global Marine	Glomar High Island V	"	5/81
	" "	Glomar Adriatic I	"	8/81
	" "	Glomar Adriatic II	"	10/81
	" "	Glomar Adriatic V	"	6/83
	Keydril	Key Manhattan	"	1/81
	Penrod Drilling	Penrod 86	"	2/82
	" "	Penrod 88	"	5/82
	" "	Penrod 90	"	8/82
	Rowan Drilling	(unnamed)	"	4/83
Marathon LeTourneau Vicksburg, Miss.	Penrod Drilling	Penrod 87	Jackup	5/82
	" "	Penrod 89	"	9/82
	" "	Penrod 91	"	1/83
	Rowan Drilling	Charles Rowan	"	3/81
	" "	Arch Rowan	"	6/81
	" "	Gilbert Rowan	"	10/81

2 — OFFSHORE DRILLING RIGS UNDER CONSTRUCTION OR ON ORDER AT U.S. YARDS — DECEMBER 1, 1980 — (Con.)

Builder	Owner	Name	Type	Delivery
	" "	Cecil Provine	"	3/82
	" "	(unnamed)	"	9/83
Vemar Shipyard Channelview, Texas	Atwood Oceanics	Richmond	Submersible	9/81
	Cliffs Drillling	(unnamed)	Jackup	7/81
	Penrod Drilling	Penrod 170	Submersible	12/81
	" "	Penrod 171	Submersible	4/82
	" "	Penrod 172	Submersible	8/82

3 — MAJOR U.S. NAVAL VESSELS UNDER CONSTRUCTION OR ON ORDER AT U.S. YARDS — DECEMBER 1, 1980

Builder	Type	Navy Nos.	No.	Est. Contract Value, $Mil.
Avondale Shipyards	Fleet Oiler	AO-177-9	3	$216.0
	" "	AO 180, 186	2	146.2
Bath Iron Works	Guided-Missile Frigate	FFG-16	1	59.4
	"	FFG-21, 24, 26	3	178.2
	"	FFG-29, 32, 34	3	147.0
	"	FFG-36, 39, 42	3	209.9
Boeing Marine Systems	Missile Patrol Hydrofoil	PHM-2	1	21.3
	"	PHM-3-6	4	178.0
GD-Electric Boat	Attack Submarine	SSN-698-1	2	856.0
	"	SSN-700-4	5	2,171.4
	"	SSN-705-10	6	2,605.6
	"	SSN-719-20	2	—
	Trident Submarine	SSBN-726	1	285.4
	"	SSBN-727-9	3	699.4
	"	SSBN-730	1	354.5
	"	SSBN-731-2	2	699.0
Ingalls Shipbuilding	Missile Cruiser	DDG-993-6	4	1,400.0
	Destroyer	DD-997	1	—
	Aegis Missile Cruiser	CG-47	1	287.8
Lockheed Shipbuilding	Sub. Tender	AS-41	1	—
Marinette Marine	Fleet Ocean Tug	T-ATF-16-9	1	7.6
	"	T-ATF-170-2	3	25.1
National Steel & SB	Destroyer Tender	AD-42-4	3	502.2
	Cable Repair Ship	T-ARC-7	1	107.0
Newport News SB	Attack Carrier	CVN-70-71	2	—
	Attack Submarine	SSN-711	1	103.2
	"	SSN-712-15	4	—
	"	SSN-716-18	3	380.8
Peterson Builders	Patrol Gunboats	F-PGG-1-9	9	78.9
Tacoma Boatbuilding	Missile Patrol Chaser	F-PCG-1-4	4	52.5
	Med. End. Cutter*	WMEC-901-4	4	130.0
	Med. End. Cutter*	WMEC-905-13	9	378.0
Todd-San Pedro	Guided Missile Frigate	FFG-14	1	48.7
	"	FFG-19, 23, 25	3	151.0
	"	FFG-27, 30, 33	3	147.0
	"	FFG-38, 41, 43	3	214.8
	"	FFG-46	1	67.7
Todd-Seattle	Guided-Missile Frigate	FFG-17-18	2	99.3
	"	FFG-20, 22	2	100.7
	"	FFG-28, 31, 35	3	147.0
	"	FFG-37, 40	2	143.2
	"	FFG-44, 48	2	135.3

*For U.S. Coast Guard.

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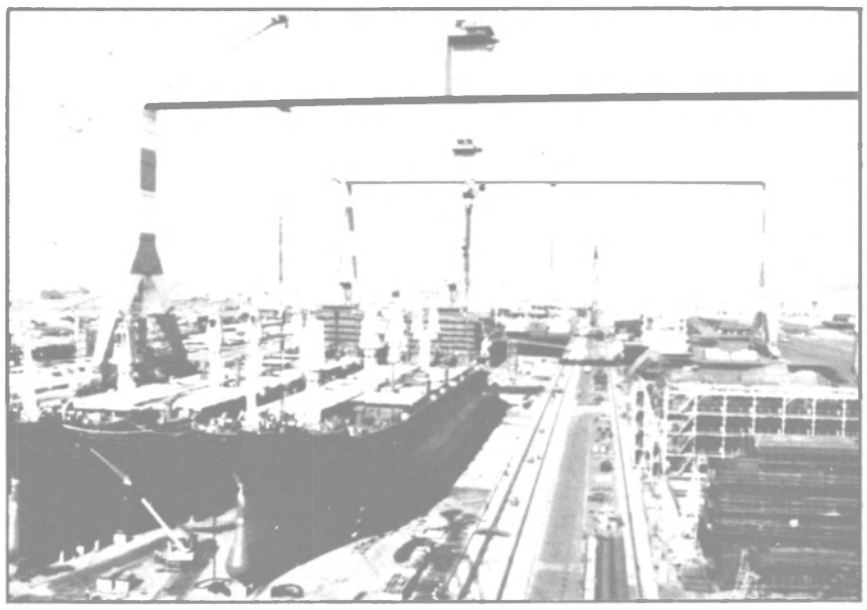

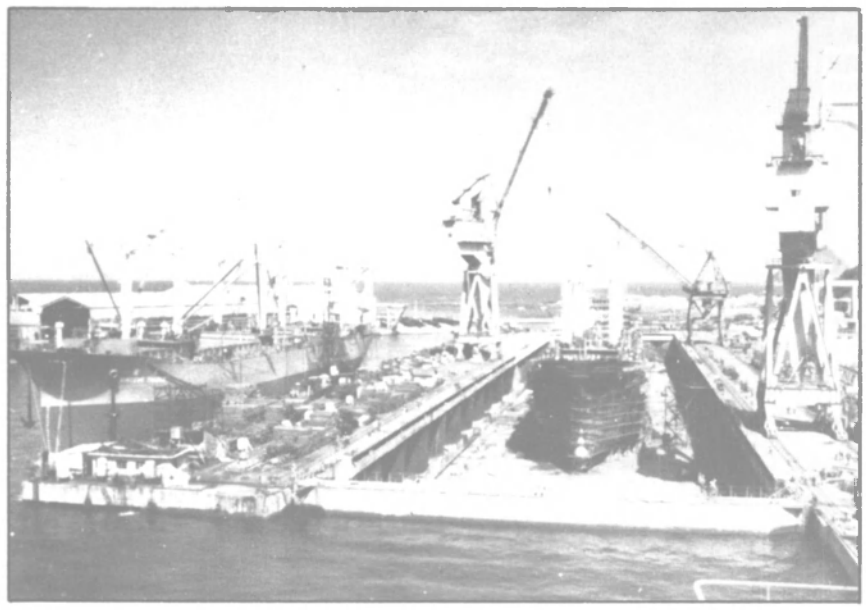

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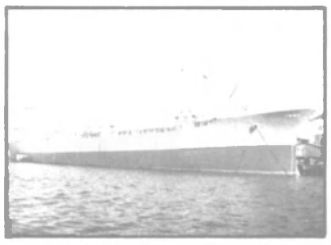

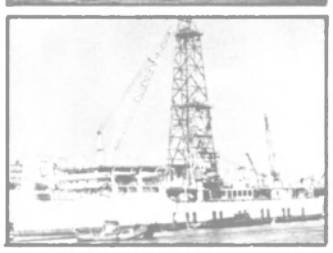

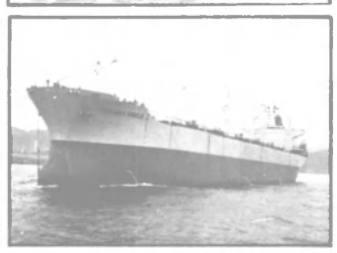

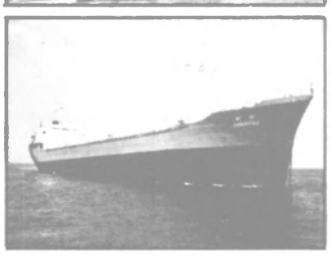

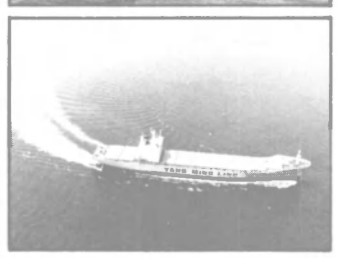

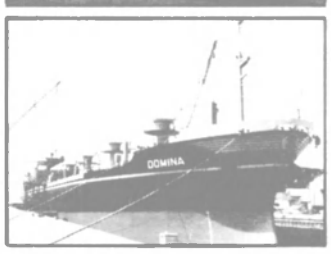

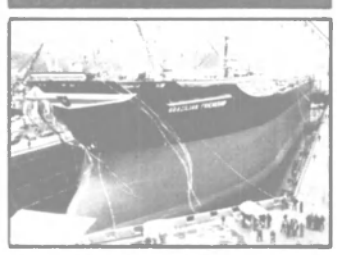

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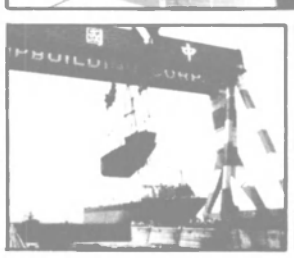

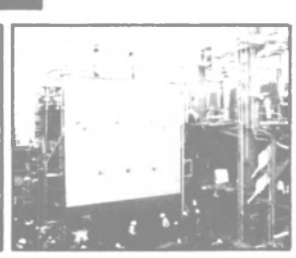

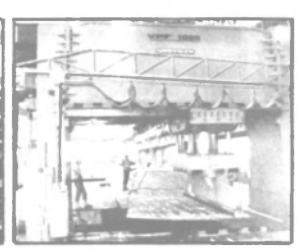

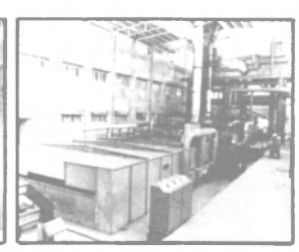

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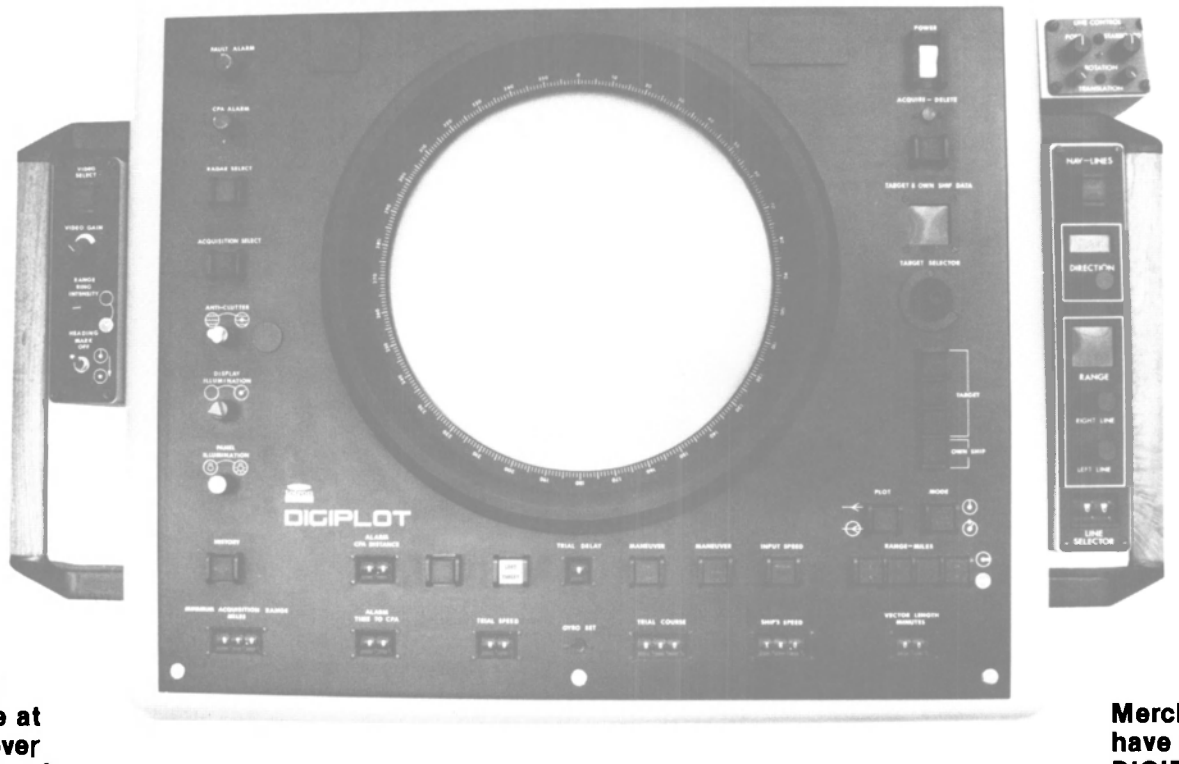

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