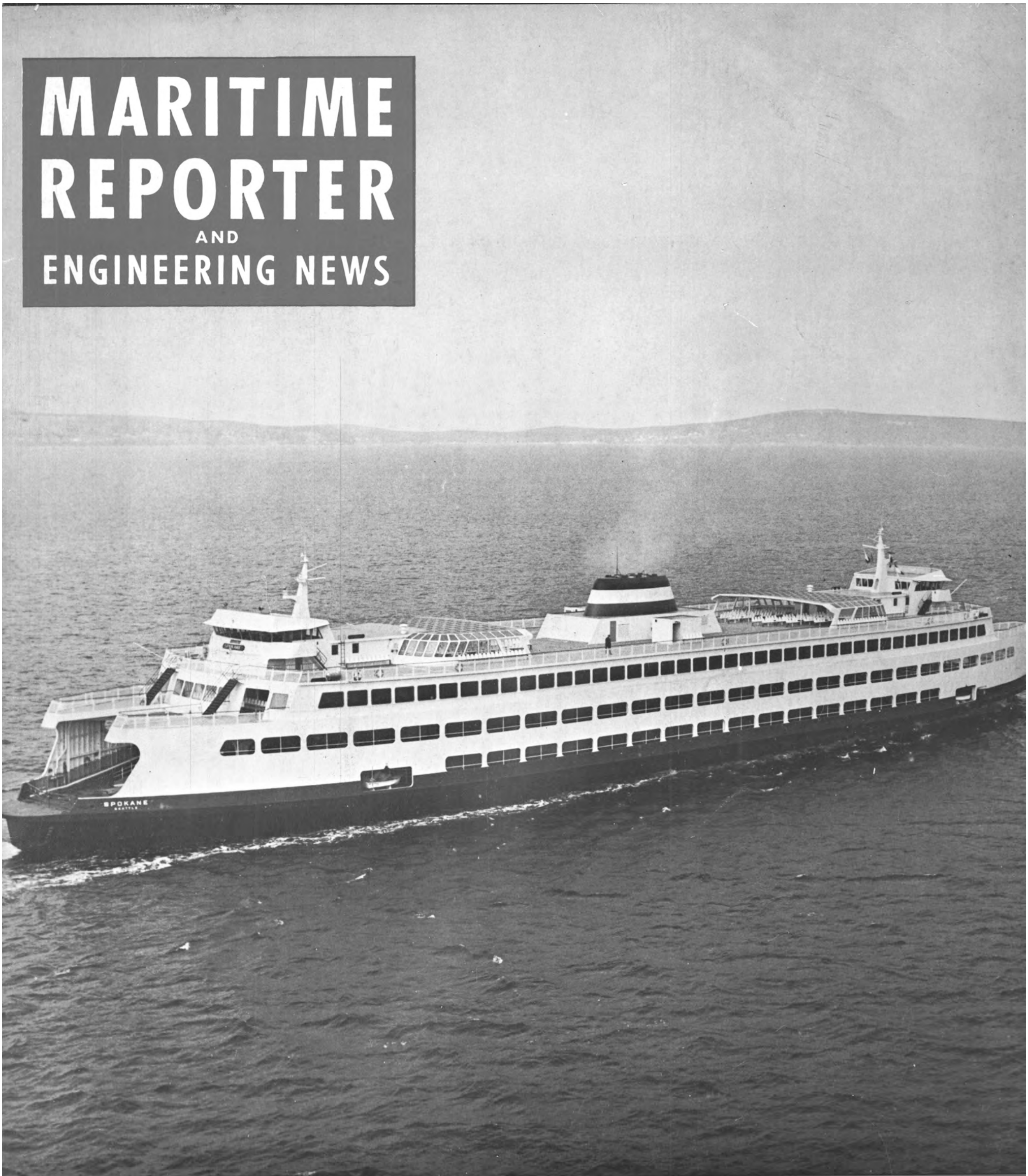
MARITIME
REPORTER
AND
ENGINEERING NEWS



Todd Seattle Yard Completes First Of Two Super-Ferries

(SEE PAGE 6)

MARCH 1, 1973

"Sail as far as the wind will take you."

That was the order given to Captain Bartholomeu Dias by King John II of Portugal as he instructed the navigator to find a trade route to India.

In August 1487, Dias set sail with two ships and headed south. Buffetted by high winds and mountainous waves, he sailed for weeks far from the sight of land.

Then, one clear day, he noticed he was following the coastline in a *northeasterly* direction. He had rounded the Cape of Good Hope without seeing it!

Dias was determined to continue on to India but the crew refused to go further.

On his return trip he tied up at the cape and named it the Cape of Storms before continuing on to complete a journey in which he had explored 1260 miles of coastline. He arrived in Lisbon in December 1488.

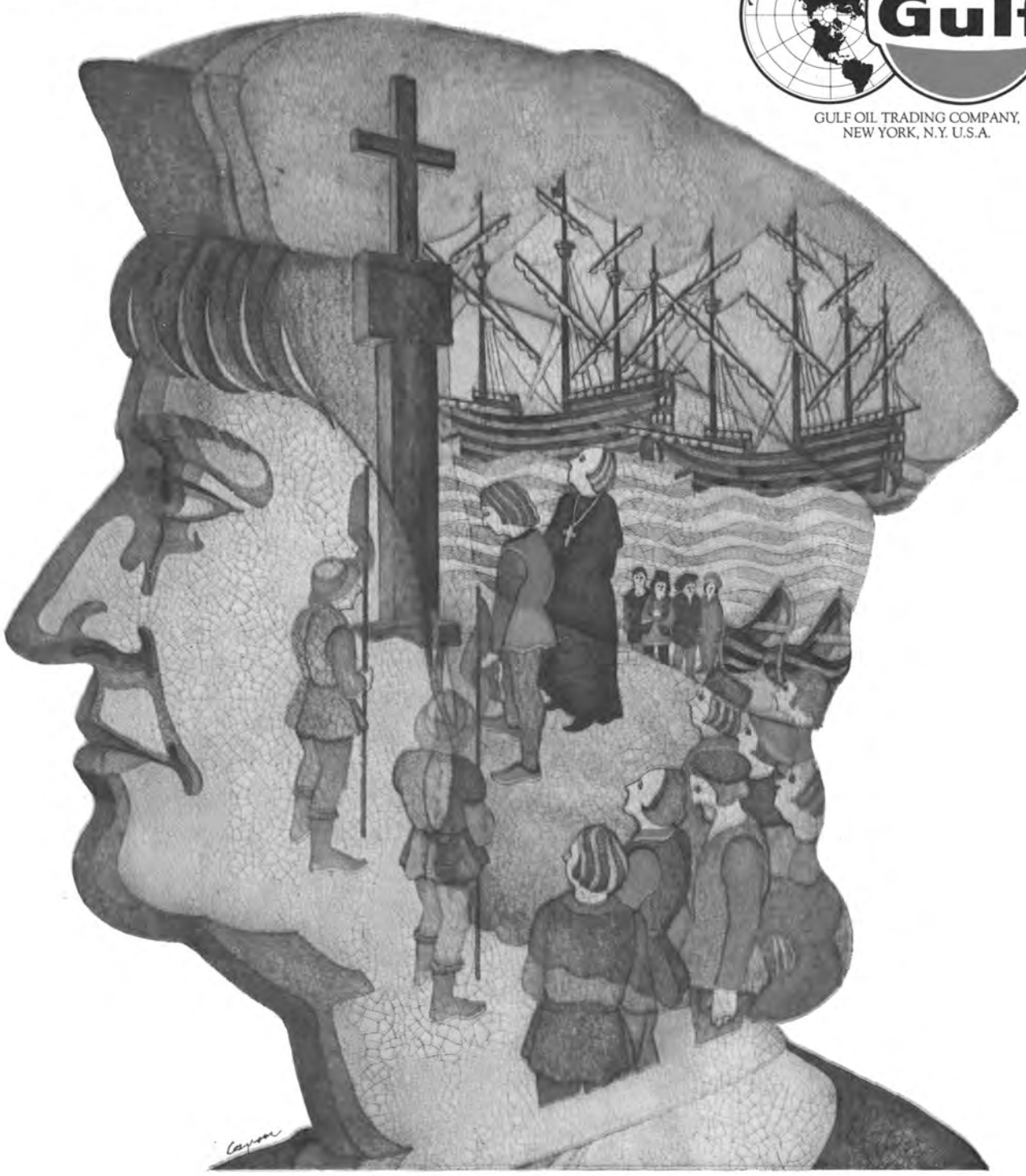
Fearful that the name, Cape of Storms, would frighten away future navigators, King John changed it to Cape of Good Hope.

But for Dias, the original name was prophetic. He perished in a storm off the cape on May 29, 1500.

This advertisement, prepared by Gulf Oil, a leading supplier of quality marine fuels and lubricants, is one of a series paying tribute to the great explorers of the sea. It is published in the interest of the shipping industry and those associated with it.

Gulf

GULF OIL TRADING COMPANY,
NEW YORK, N.Y. U.S.A.



Round-the-clock competence

McAllister Brothers, Inc. Towing and transportation. 17 Battery Place, New York, N.Y. 10004. (212) 269-3200. Serving the ports of New York, Norfolk, Philadelphia, and San Juan.

McAllister

Dearborn-Storm To Add Two New Vessels Totaling $4.5 Million

Dearborn-Storm Corporation, Chicago, Ill., has announced plans for two major additions to its marine service fleet as part of the company's program of continued expansion in the offshore petroleum services industry. The vessels will be built in the United States at a combined cost of about $4.5 million for delivery in early 1974. Each vessel will be 200 feet in overall length, and each will be powered by twin engines capable of developing 9,000 horsepower. As such, they will rank among the world's largest and most powerful petroleum support vessels, capable of heavy-duty operations in remote areas of the world under the most severe weather conditions.

Arthur Weiss, Dearborn-Storm president, said: "As the search for oil and gas is pushed into deeper waters, further away from established supply bases, there will be a growing need for the more modern, powerful support vessels of the type we are building. Their addition to our fleet of 33 vessels will enhance our ability to successfully operate anywhere in the world."

St. Louis Ship To Build 3 Towboats For ARTCO

In a recent joint announcement, **Richard B. Yeomans,** manager of the marine department for American River Transportation Co., and **Anthony Tobin,** vice president of the St. Louis Ship Division of Pott Industries, revealed that American River Transportation Co. has ordered three 8,400-hp towboats from the St. Louis, Mo.-based shipbuilding firm.

All vessels will feature the famous St. Louis Ship exclusive Hydrodyne hulls, and the latest Kort nozzle designs. The hulls will measure 200 feet by 50 feet by 11 feet 6 inches, and the propulsion will be with Electro-Motive 16-645 E-5 turbocharged diesel engines. Delivery of the three towboats is scheduled for early 1974.

American River Transportation Co., formed January 1, 1972, is a wholly owned subsidiary of Archer Daniels Midland Company. During 1972 and 1973, they will have constructed and/or acquired a total of 215 barges. The firm also charters on a long-term basis an additional 60 dry bulk barges. ARTCO is also headquartered in St. Louis.

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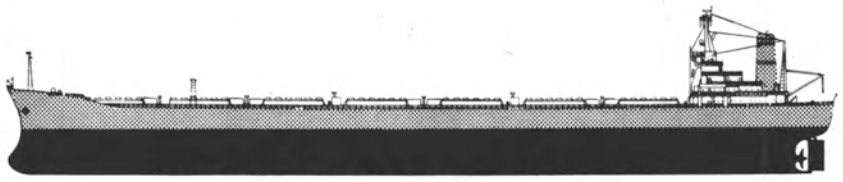
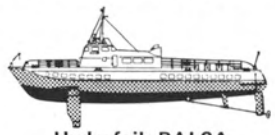
What's our shipbuilding capacity?

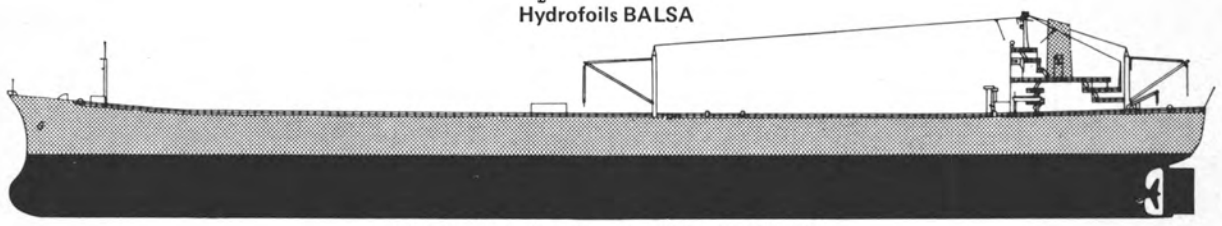
Here's the long and the short of it.



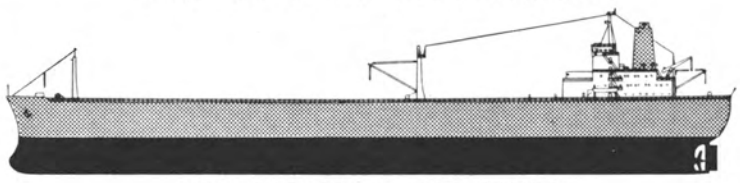
60,000 DWT bulk carrier OGDEN THAMES



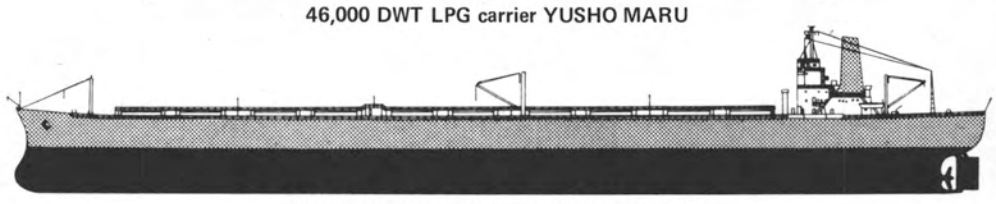
Hydrofoils BALSA



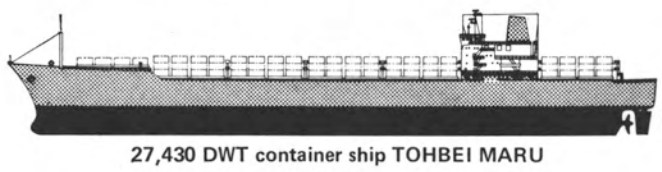
260,000 DWT oil tanker IOANNIS CHANDRIS



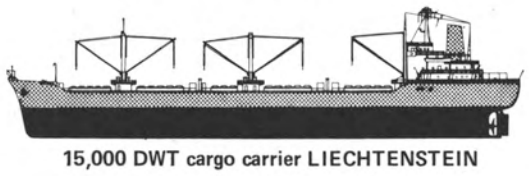
46,000 DWT LPG carrier YUSHO MARU



160,000 DWT ore/oil carrier WORLD GUARD



27,430 DWT container ship TOHBEI MARU



15,000 DWT cargo carrier LIECHTENSTEIN

HITACHI ZOSEN

HITACHI SHIPBUILDING & ENGINEERING CO., LTD.

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Tokyo Office: Chiyoda-ku, Tokyo, Japan Telex: J24490 Cable Address: SHIPYARD TOKYO
Overseas Offices: London, New York, Düsseldorf, Hong Kong, Oslo, Singapore, Greece

Powered by General Motors Electro Motive Division 8,500-hp diesels driving Coolidge propellers, the double-ended Spokane had to go through two complete trial tests—once for each end.

$9-Million Queen Of Washington Ferry Service

The Super-Ferry Spokane

Built By Todd Shipyards Corporation Seattle Division, The Spokane And Her Sister Ship Walla Walla Are Each Capable Of Carrying 206 Cars And More Than 2,000 Passengers At Speeds Up To 20 Knots

The new super-ferry Spokane, a 440-foot $9-million queen of the Washington ferry system, and believed to be the world's largest and fastest double-ended ferry ever built, has just been completed by Todd Seattle.

The Spokane is the epitome of luxury, a unique feature in a vessel usually noted for a strictly utilitarian, if not spartan, design. From the colorful exterior to the lavish, ultramodern interior, the Spokane is designed to attract the eye, and the tourist.

The new ferry is equipped with a propeller and rudder at each end, and is powered by 8,500-hp diesel engines. She is capable of carrying 206 cars and more than 2,000 passengers at speeds up to 20 knots. She is 58 feet longer and carries 46 more cars than the present Hyak class now in service.

Her sea trials consisted of a major mile run which included some 15 runs at various speeds near Vashon Island, and other tests in the Point Wilson area of the Straits of Juan de Fuca. According to Todd's trial operators, some 100 men who participated in the runs on each trip and who have logged trial miles on Puget Sound on a myriad of vessels, the trial run of this double-ender had its unusual aspects. As Todd's chief trials engineer **George Gilreath** pointed out, unlike other trials in conventional ships, the various tests for the Spokane had to be conducted twice: once for each end, to make sure that both ends are seaworthy.

Specifications and designs of the two new ferries were handled by Philip F. Spaulding & Associates (now Nickum & Spaulding Associates, Inc.), naval architects and engineers of Seattle. To meet requirements of the Coast Guard, the new ferries feature complete drainage, fuel oil, lubricating oil, firefighting, and freshwater systems. Safety, heating, and ventilation were, of course, other design considerations.

Construction specifications called for hulls of welded-steel construction and transverse frames with a complete innerbottom fitted through the area below the main engine room. Main engine foundations form an integral part of each

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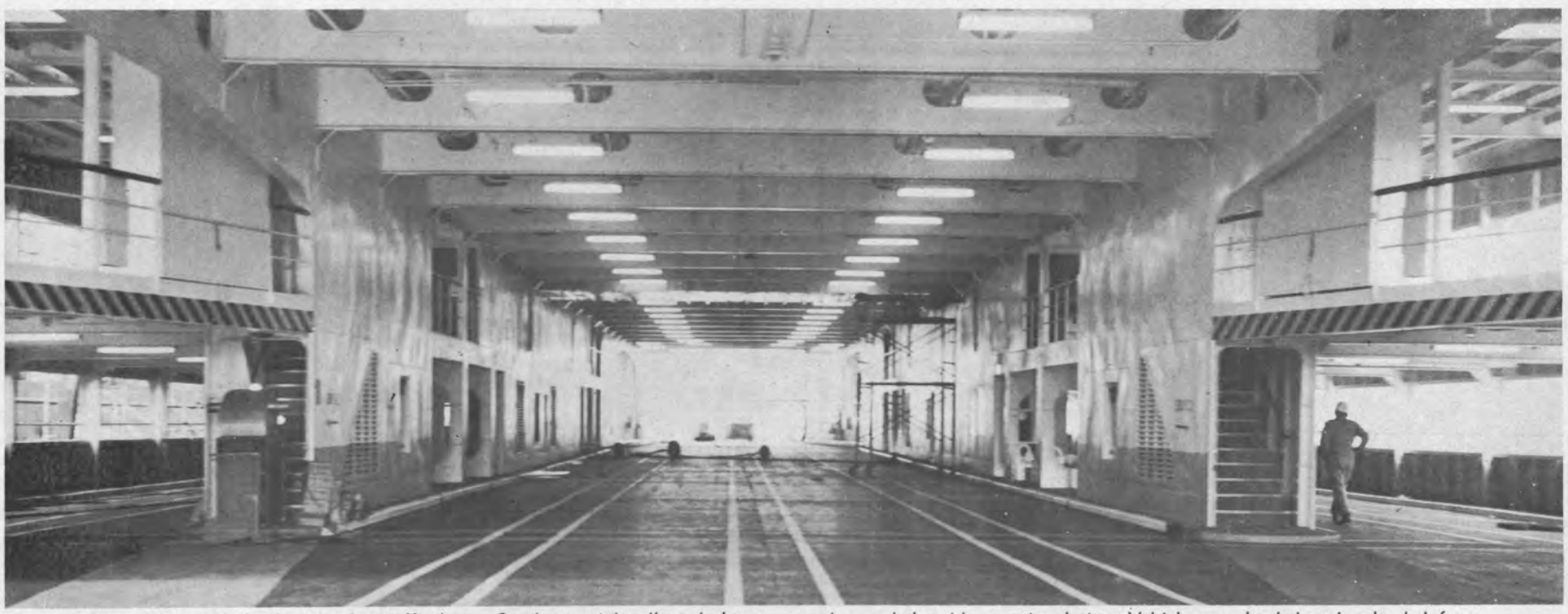


The main car deck, showing the traffic lanes. On the partial gallery deck are four more passenger-auto lanes, two on each side, between the outboard engine casing and the side curtain plating. Vehicles are loaded and unloaded from each end of the gallery deck through the inclined ramp to the main deck.

double-bottom structure. All fuel oil (diesel) storage is in the double-bottoms of the engine room. Drinking water is stored in rectangular tanks in each end within void compartments.

The movement of vehicles on and off the ferries will follow the usual course: through either ends of the main deck. A partial deck located just above the main deck provides additional lanes for better, faster handling of traffic.

The main deck has four truck or auto lanes at the center section between the engine casings, and four other passenger-auto lanes are situated outside of the engine casing, two on each side.

On the partial gallery deck are four more passenger-auto lanes, two on each side, between the outboard engine casing and the side curtain plating. Vehicles are loaded and unloaded from each end of the gallery deck through the inclined ramp to the main deck.

The vessels' space arrangements were carefully planned to provide the maximum of passenger comfort and luxury. Since one ship is slated to make a 20-minute six-mile run, and the other a run lasting two full hours, the interior designer has stressed the need for an atmosphere conducive to greater sociability and increased communications among passengers.

Primary space for passengers is on the upper deck and secondary space with protected "outside" seating in the two solariums on the sun deck. The upper deck arrangement includes informal, carpeted seating areas, a cafeteria, galley, office, first-aid room, nonsmoking areas, table and settee area for group seating, utility spaces, and rest rooms.

Passenger inside seating is 1,532, and outside seating is provided for 468 passengers. Total seating capacity is 2,000.

Officers and crew staterooms to accommodate 17 men are located behind each wheelhouse on the sun deck. For convenience of operating personnel on each ferry, a maintenance crew locker and sitting room is provided on the upper deck, a deck crew locker and sitting room on the second deck, an enclosed engineer's locker and sitting room in the engine room.

The dining facilities of the nation's biggest and fastest of the double-ended ferries is no gourmet restaurant nor does her sun decks rival those of the ocean's best private luxury liners, but the Washington State ferry Spokane's living spaces, decks and passenger sections possess exquisite decor of the first order. The interior of the Spokane features carpeted floors, ornate lighting and golden tones, which add up to passenger comfort, as can be seen in the pictures on this page.

Tourists, as well as daily commuters, will appreciate the attractive quality of the interiors of this new class of Puget Sound ferry, to say nothing of the vehicle capacity for 206 standard-size automobiles, which should greatly help the overload problem which plagues many ferry users during peak commuter hours and on weekends during the busy summer months.

The Spokane is scheduled to serve on the Seattle-Winslow run next month. Her sister ship, Walla Walla, is on a Todd Seattle drydock, her work in full swing, with a completion date also scheduled for next month. Todd won the contract to build the two Washington State ferries at $17,788,000 and an additional bid of $113,176 for the two solariums on each ferry. This sum was made available by action of the 1970 Legislature, which earmarked 3/8ths of one cent of the state gas tax for the improvement of cross-Sound transportation.

Principal Suppliers

Main Engines	Electro Motive Div. General Motors
Electrical Propulsion Components	General Electric
Diesel Generators	Waukesha
Electrical Distribution	Square D
Shafting	Earle M. Jorgensen
Propellers	Coolidge
CO_2 Fixed System	Walter Kidde
Radar	Decca
Thrust Bearing	Waukesha
Stern Tube Bearings	Waukesha
Pumps	Pacific Pumping
	Carver
Steering Gear	Sperry
Bell Logger & Telephone	Henschel
Fuel Oil Centrifuge	DeLaval
Galley Equipment	J. & F. Industries
M. J. Doors	Grand Metal Products
Sliding W.T. Doors	Walz & Krenzer
Deck Covering & Wall Covering	Fryer-Knowles
Insulation	E.J. Bartells Co.
Interior Decor	Stanley Plastics
	Commercial Displayers
	Cascade Glass
	Fryer Noble
Interior Designs	Burhans
Vent Fans	Aladdin
	Buffalo
Marinite	Johns Manville Co.
Windows	Cornell Carr
Ventilation Controls	Powers Regulator
Life Preservers	Atlantic Pacific
Furniture	Tri-Way Industries
Compasses	Baker Lyman
Line Shaft Bearing	Cooper

The upper deck (passenger deck) of Spokane's number one end. Photo taken from the bow.

Another upper deck view showing the stairs to the two solariums on the sun deck.

Looking into the galley from the serving line. Portions of the ornate lighting are visible.

J. Rod A. Lindsay Appointed President Seaspan International

J. Rod A. Lindsay

James C.F. Stewart, chairman and chief executive officer of Seaspan International Ltd., North Vancouver, British Columbia, Canada, has announced the appointment of **J. Rod A. Lindsay** as president.

Prior to his appointment as president, Mr. **Lindsay** was executive vice president of Seaspan. He has served in the marine transportation field with Seaspan and its predecessor companies since 1948. He is a graduate of the University of British Columbia in mechanical engineering. Mr. **Lindsay** is a past president of the Vancouver Merchants' Exchange and the B.C. Towboat Owners' Association, and is active in other business and community oriented organizations.

Seaspan is a diversified coastal and deepsea transportation and salvage company specializing in tug and barge operations in the Pacific region. It is jointly owned by Genstar Limited and Dillingham Corporation.

Gotaas-Larsen Orders VLCC From Kawasaki

Gotaas-Larsen Shipping Corp. has ordered a 257,000-dwt tanker from Kawasaki Heavy Industries of Japan, according to **H. Irgens Larsen,** chief executive officer of the company. The order, calling for delivery in the first quarter of 1976, is subject to issuance of an export license by the Japanese Government.

The company, a subsidiary of International Utilities Corp., has taken delivery on four 216,000-ton tankers and will commission a fifth when Kawasaki completes the ship. The newly ordered vessel will be 1,197 feet in overall length, have a beam of 207 feet, and will draw 72 feet.

French Yard Receives Order For Two Tankers From Onassis Group

Two tankers, each 270,000 deadweight tons, have been ordered from Chantiers de L'Atlantique S.A. by Olympic Maritime, Ltd., part of the group headed by **Aristotle Onassis.**

The order, subject to certain credit conditions, is for one of the vessels to be delivered by the end of 1974, and the other by the end of 1975.

AMF Completes Sale Of Beaird Subsidiary To The Riley Company

Howard C.Warren, chairman of The Riley Company, and **Rodney C. Gott,** AMF Incorporated chairman and chief executive officer, have announced that the sale of the business and assets of AMF Beaird, Inc., a wholly owned subsidiary of AMF Incorporated, to The Riley Company has been completed.

The transaction was for a sum in excess of $25 million. Agreement in principle providing for the sale of AMF Beaird to The Riley Company was also announced.

The Beaird Company is located in Shreveport, La. Its primary manufacturing complex was built in 1964, and it is one of the largest metal fabricating plants in the Southwest, with more than 600,000 square feet of "under-roof" manufacturing area.

The Riley Company, based in Chicago, Ill., through its Riley Stoker subsidiary, is a major manufacturer of steam generators and fuel-burning equipment for the electrical power and other industries. Beaird will operate as a subsidiary of Riley Stoker Corporation under the name Riley-Beaird, Inc.

AMF Incorporated is a worldwide producer of industrial and leisure time products.

$7.5-Million Contract Awarded To NASSCO For Navy Ship Design

According to Navy Secretary **John Warner,** National Steel and Shipbuilding Company has signed on January 26, 1973, a $7.5-million contract with the U.S. Navy for the design support of a new sea control ship.

National Steel and Shipbuilding Company will assist the Navy in the design of the new ship. NASSCO will also advise on major technical discussions and will introduce producibility considerations and innovations features early in the design process.

When funded, NASSCO will accomplish detailed design of the ship and will work with the Navy at offices in San Diego, Calif., Hyattsville, Md., and New York, N.Y.

Subject to appropriations, a year or more from now, NASSCO will be given the opportunity to negotiate with the Navy on construction of the lead ship.

The preliminary concept indicates that the sea control ship will have an overall length of about 610 feet, a beam of about 80 feet, with displacement of about 14,000 tons.

This ship will carry helicopters and vertical short take-off and landing (VSTOL) aircraft to extend the offensive/defensive capability of fleet elements.

NASSCO is owned equally by Kaiser Industries Corporation and Morrison-Knudsen Company.

PDM Steel Appoints Fred E. Hamren Jr.

Fred E. Hamren Jr.

Fred E. Hamren Jr. has been appointed manager of marketing for the Eastern Division of Pittsburgh-Des Moines Steel Company, with corporate offices on Neville Island near Pittsburgh, Pa.

A graduate of the University of Michigan with a degree in civil engineering, Mr. **Hamren** has been associated with PDM since 1957. He was manager of sales for the Systems Group.

MarAd Approves Mooremack Subsidiary To Carry Energy Fuels

The Maritime Administration has approved the establishment by Moore and McCormack Co., Inc. of a new subsidiary—Moore McCormack Energy Inc.

The new corporate offspring, which had to be sanctioned by MarAd because of Moore-McCormack's subsidized shipping operations, "will engage in activities in the energy field particularly related to the purchase of part interests in refineries, and the carriage of energy fuels by tanker," the order said.

Ameron Appoints Middle East Rep.

The Ameron Corrosion Control Division, Brea, Calif., has announced the appointment of **William E. East** as its sales and engineering representative in the Middle East. Reporting to the company's wholly owned subsidiary, Amercoat Europa N.V., with headquarters in the Netherlands, Mr. **East** will be based in Tehran, Iran. From Tehran, he will serve the rest of Iran, Kuwait, Saudi Arabia, Bahrain, and the Trucial Coast in the Persian Gulf.

Ameron corrosion control products have a wide variety of well-known trade names, including Amercoat® and Dimetcote® primers and coatings; Nuken® and Nu-Klad® grouts, cements and surfacings; T-Lock® and Nob-Lock® PVC sheetings, and Bondstrand® FRP pipe.

Mr. **East,** who has been with Ameron since 1968, has more than 25 years of pipeline, production, and storage experience in oil fields and terminals throughout the world.

Pearlson To Build Syncrolift Drydock In Capetown, South Africa

Pearlson Engineering Co., Inc. has announced that it has been awarded a contract to design and build a drydock for the Government of South Africa, at Table Bay, Capetown.

The Syncrolift marine elevator drydock is scheduled for completion this year, and will replace the old Alfred Basin Slipway now being phased out of operation. The new installation and others at Walvis Bay and Simonstown bring to three the number of Syncrolifts built by Pearlson for the South African Government.

According to port authorities, this Syncrolift has a rated capacity of 1,730-tons displacement. It will handle four times the number of vessels and occupy less space than the marine railway it is replacing. This will permit enlargement of the ship repair area.

Raymond Pearlson, president of the Miami, Fla.-based firm and inventor of the Syncrolift, has engineered and built more than 80 Syncrolifts in 36 countries, including 16 naval installations.

The 14-year-old company, situated at 8970 S.W. 87th Court, Miami, Fla. 33156, designs and builds the Syncrolift marine elevator drydocks and transfer systems to handle vessels of up to 60,000 deadweight tons.

George D. Carameros Elected Director El Paso Natural Gas

George D. Carameros Jr.

George D. Carameros Jr. has been elected a director of El Paso Natural Gas Company, one of the nation's largest natural gas transmission firms, it was announced in Houston, Texas.

Mr. **Carameros** is vice president in charge of El Paso's liquefied natural gas projects division, which coordinates the company's expanding participation in worldwide LNG activities. He joined El Paso Natural in 1948.

Mr. **Carameros** has served as vice president of the company since 1970, and previously was head of the economics and estimating department, manager of new developments of El Paso Products Company (a subsidiary), and managing director of El Paso Europe-Afrique, with headquarters in Paris. In the latter capacity, he directed El Paso's exploration and production program in the Algerian Sahara, and other activities in Europe.

In 1965, he returned to New York City as administrative assistant to the chairman of the board. He was named an assistant vice president of the company in 1966.

Mr. **Carameros** is headquartered at the executive offices of the company in Houston.

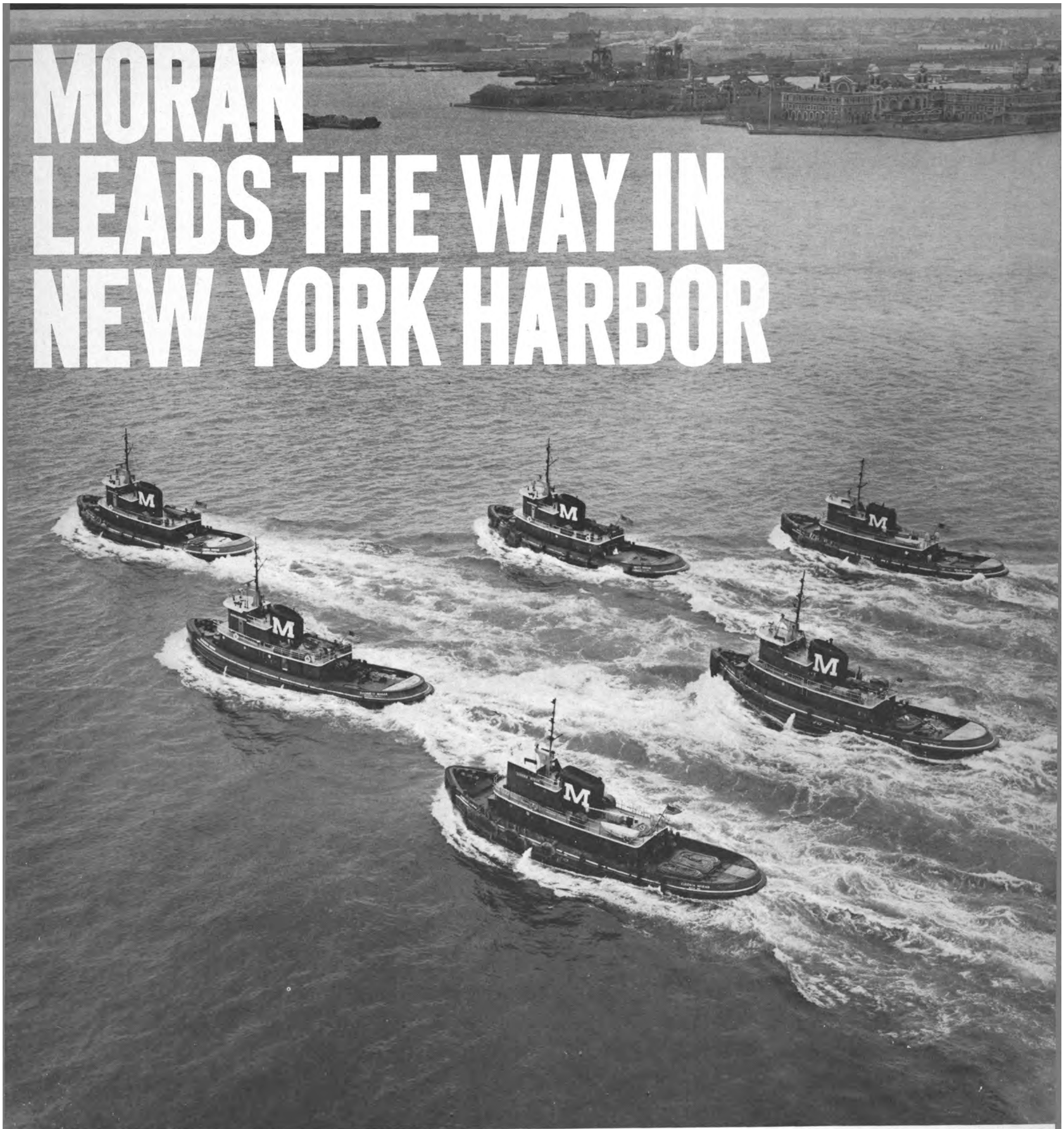
Houston Systems Completes Tests On Giant Rig

Joe Stine, president of Houston Systems Manufacturing Co., Houston, Texas, has announced the completion of the rig-up and testing of a unique diesel electric drilling rig.

Helicopters will move the Aero Rig/500, owned by Helmerich-Payne International Drilling Company, in the jungles of South America. The giant rig is engineered to be moved by aircraft or helicopter in packaged components of 4,000 pounds or less.

The 1,200-horsepower drawworks was designed and built by Houston Systems for helicopter relocation. The company also manufactured the air, water and mud systems, and packaged the electricals. All are unitized for minimum rig-up and maximum lift.

Houston Systems has provided engineered products and services for industry since 1952.



Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, N.Y. 10048

1973 SNAME Spring Meeting Program— The Wonderful World Of Small Ships

The Society of Naval Architects and Marine Engineers has announced the program for the 1973 "The Wonderful World of Small Ships" Spring Meeting to be held in Walt Disney World, Florida, on April 1 through 4. The meeting, which is being hosted by the Southeast Section of the Society, will be held in the Contemporary Resort Hotel, P.O. Box 78, Lake Buena Vista, Florida 32830.

All technical sessions will be held in the Atlantic & Pacific Room of the Contemporary Resort Hotel so that members will have the opportunity to hear the presentation and discussion of each paper. In addition, an enjoyable social program has been arranged.

The meeting will start at 9:00 a.m. on Monday, April 2, with the Welcome and President's Report, followed by the presentation of technical papers. In order to allow members and their guests to enjoy sightseeing and other events, technical sessions will be held only during the morning hours of the Spring Meeting.

Technical Papers

Monday, April 2, 1973

Paper No. 1. "Development of a High-Speed Rescue Boat" by **P.B. Fontneau, E.L. Jones** and **W.A. Buote.**

Synopsis—This paper describes investigations by the Coast Guard to determine type, operational environment, design requirements for a craft which can meet the need for a small high-speed rescue boat suitable for moderate surf and shallow river entrances.

Paper No. 2. "Radar Returns from Small Craft" by **Lindsay L. Lord.**

Synopsis—The object of this paper is to update information on methods of assuring suitable radar return from small craft during search and rescue operations with particular reference to hulls of wood, plastic, and metal. Full-scale testing is reported on craft up to 45 feet in length.

Paper No. 3. "Some Considerations in Power Cruiser Design" by **George E. Meese.**

Synopsis—This paper details developments in basic power boat parameters over a period of 40 years. Data is graphed and future trends predicted.

Paper No. 4. "Evaluation of the Trim of a Planing Boat at the Inception of Porpoising" by **John C. Angeli.**

Synopsis—A mathematical procedure is presented for the prediction and evaluation of trim at the inception of porpoising in a planing power boat. Paper considers prismatic and warped surfaces.

Paper No. 5. "High-Speed Propeller Design" by **Robert F. Kress.**

Synopsis—Criteria for the design of high-speed propellers is established using empirical techniques developed by the manufacturer. Analytical and theoretical principles are discussed. Special emphasis is given to key decisions regarding trade-offs.

Paper No. 6. "Experimental Performance of a Partially Submerged Propeller in Inclined Flow" by **Richard Hecker.**

Synopsis — Paper presents performance characteristics for a series of propellers operating partially submerged at angles up to 30 degrees.

Paper No. 7. "Inclined Shaft Propeller Performance Characteristics" by **J. Peck** and **D.H. Moore.**

Synopsis—Data is given for test results from a series of commercial propellers operating at effective craft speeds up to 50 knots. Vertical and horizontal forces are given in addition to the usual torque and thrust readings.

Paper No. 8. "Planing Craft Performance with Tunnel-Hull Propellers" by **K. Harbaugh** and **D.L. Blount.**

Synopsis — This paper presents the results of experiments on self-propelled craft with and without tunnel-hull forms. The performance of the two types are compared and the results reported in a form useful to designers.

Tuesday, April 3, 1973

Paper No. 9. "The Ugly American-Boat" by **Karl Brocken** and **Douglas VanPatten.**

Synopsis—It is the object of this paper to familiarize naval architects with the type and scope of services provided by the industrial designer. Paper records the history of a special project and discusses client relations.

Paper No. 10. "The Naval Architect and His Patent" by **Morton Amster.**

Synopsis—This paper deals with the every-day practical aspects of the inventor-designer-patentee relationships. It is a guide to legal first aid for the inventor suggesting procedures to be followed to protect intellectual properties.

Paper No. 11. "The A.B.Y.C. and How it Helps Build Better Boats" by **G. James Lippmann.**

Synopsis — Paper reports on American Boat and Yacht Council participation in assisting the government and industry to cooperate in the development of product (boat) safety standards.

Paper No. 12. "The Coast Guard's Safety Product Assurance Program" by **Richard Rybacki.**

Synopsis — Paper introduces the basic concept of product assurance, achieving a minimum level of safety in boats and associated equipment to insure compliance with Coast Guard safety standards. Summarizes certification and notification regulations.

Paper No. 13. "The Coast Guard's Second Generation Standards Program and its Impact on Small Craft Design" by **Richard Brooks** and **Christopher Llana.**

Synopsis — Paper is an overall review of the Coast Guard activities in the industry and safety standards field. Priorities on future standards are discussed.

Paper No. 14. "Alumability" by **Chester H. Holtyn.**

Synopsis—This paper is a broad updating look at the aluminum small craft—its advantages and limitations in design; its serviceability, production, and durability. Basic design guidance is given.

Paper No. 15. "The Performance of High-Speed Rudders in a Cavitating Environment" by **D.L. Gregory** and **G.F. Dobay.**

Synopsis—A number of rudder shapes were experimentally evaluated with respect to turning efficiency up to full-scale craft speeds of fifty knots. Guide for size and shape for rudders operating in a cavitating environment.

Wednesday, April 4, 1973

Paper No. 16. "Electric Power for Small Commercial Vessels" by **Frank C. Vibrans** and **John B. Woodward, III.**

Synopsis—Generation and distribution of electric power aboard small commercial vessels is treated by general background discussion, review of typical design problems, and by detailed description of two actual systems.

Paper No. 17. "What Every Shipyard Needs to Know About Marine Heavy Duty Gas Turbines" by **N.A. Svensen.**

Synopsis—A broad treatment of industrially derived gas turbine characteristics from the standpoint of the users' need for information.

Paper No. 18. "New Power Systems and Their Potential for Marine Applications" by **Leonard J. Keller.**

Synopsis — This paper reviews the development of a Rankine cycle low-entropy energy-conversion system using fluorcarbon for the fluid instead of water. Design details of components are discussed.

Social Events

Early Bird hospitality and cocktail party. Sunday evening, 5:00 to 7:00 p.m., in the Atlantic Room, Americas level, Contemporary Resort Hotel.

Orientation Buffet Breakfast Monday, 7:00 to 8:00 a.m., in the Columbia Room, Americas level, Contemporary Resort Hotel, for members, ladies, children and guests. A Disney World hostess will give a brief talk on "How to See Disney World."

Mixed Luncheon, Cocktails, Monday at 1:00 p.m. in the Columbia Room. Luncheon in the Columbia Room at 1:30 p.m. for members, ladies, children and guests. General **William E. Potter,** USA (ret.), senior vice-president, Walt Disney World Co., will be the guest speaker.

President's Reception — Society President **Phillip Eisenberg** will be host to all registrants and their ladies at this social event on Monday, April 2, from 7:00 to 8:00 p.m., in the Pacific Room, Americas level, of the Contemporary Resort Hotel. Beverages and hors d'oeuvres will be served.

Section Meeting—The Southeast Section will hold a business meeting (Annual Meeting) and election of officers for the ensuing year on Tuesday at 8:00 a.m. in the Atlantic Room.

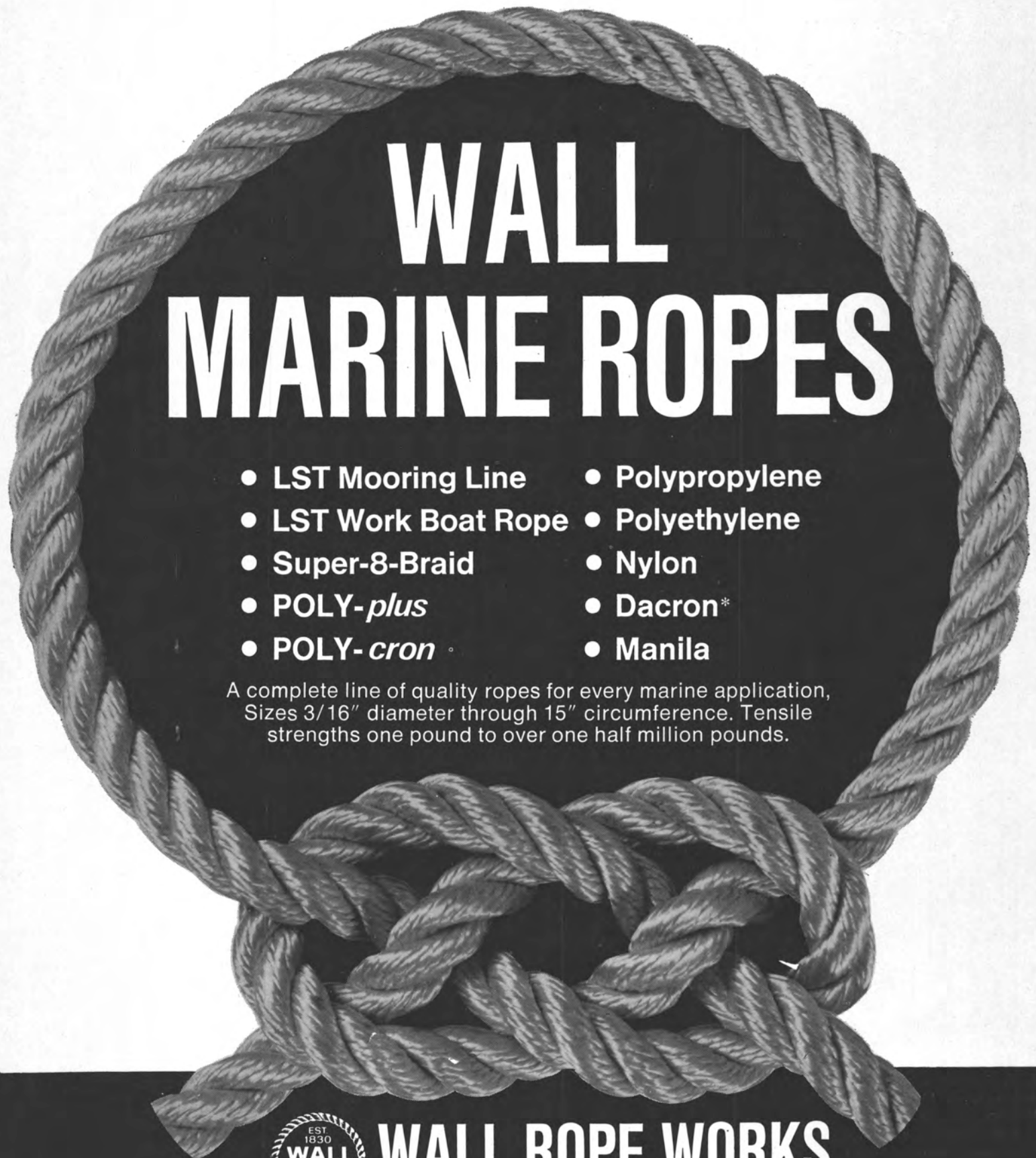
Golf Tournament — Tuesday, April 3. Starts have been blocked out between 12 noon and 1:30 p.m. on the Disney PGA Palm and Magnolia courses. Trophies to be awarded Wednesday. Club rentals available.

V.I.P. Tour — An interesting V.I.P. tour has been arranged for Tuesday afternoon, starting at 2:30 p.m. Details will be announced at the meeting.

Luau — Tuesday evening, 7:00 p.m., at the Polynesian Village. Enjoy refreshing Mai Tai cocktails; feast on native delicacies served buffet-style; then watch the spectacular Kaui-Pono Polynesian Revue.

Awards Luncheon—Wednesday at 1:00 p.m. In the Columbia Room, followed by luncheon at 1:30 p.m. Awards and certificates will be presented as a finale to "The Wonderful World of Small Ships."

This outstanding program was planned by the Steering Committee under the chairmanship of **Jean E. Buhler,** assisted by **Raymond T. Greene** as secretary-treasurer. The balance of the Steering Committee is as follows: finance and budget under the chairmanship of **Edward L. Teale** assisted by **John R. Newell,** and **Frank C. DeGrim**; registration, **William L. Lane,** chairman and **Charles W. Bond, Harold F. Robinson,** and **Eugene E. Sanchez**; social events and protocol, **George H. Hodges**; technical sessions and papers, **Robert W. Hobbs,** chairman, and **Peter C. Ball, Rudolph F. Matzer, James S. Nelson,** and **V.H. Van Bibber**; arrangements, **E.B. Williams,** chairman, and **Harold F. Robinson**; golf tournament, **Irvin J. Stephens**; and publicity, **Charles S. Smith.**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Bath Iron Launches AEL's Newest Containership

Shortly before launching ceremonies for American Export Lines' containership Export Patriot, the following dignitaries posed in front of the podium: (left to right) **Laurence J. Buser,** president and chief executive officer of American Export Lines; **Mrs.** and Commissioner **Ashton C. Barrett;** Mr. and **Mrs. Robert J. Blackwell;** Commissioner **James V. Day,** and **James F. Goodrich,** president, Bath Iron Works.

The Export Patriot, last of six containerships built by Bath Iron Works for American Export Lines, Inc., was launched on February 3 at Bath, Maine. These vessels are the largest ships ever constructed in the state of Maine.

Mrs. Robert J. Blackwell, wife of the Assistant Secretary of Commerce for Maritime Affairs, sponsored the vessel by shattering the traditional bottle of champagne on the bow as the new containership slipped into the Kennebec River.

The Export Patriot displaces 26,670 tons, has a length of 610 feet overall, a beam of 78 feet, and a design draft of 27 feet. Her General Electric turbine propulsion system is rated at 17,500 shaft horsepower and her service speed is 21 knots. With five hatches and a system permitting deck stowage of containers, she has a capacity of 1,070 twenty-foot containers, or the equivalent in 20-foot and 40-foot containers, refrigerated vans and gondolas.

The ship's power plant is fully automated and may be operated from a central console located on the bridge. She features air-conditioned accommodations throughout.

For maneuvering ease during docking and undocking, and for operations in restricted waters, the vessel is equipped with an 800-horsepower bow thruster which is controlled from the bridge. The Export Patriot has a bulbous bow and cruiser stern, and the upper portions of her hull are fabricated of high tensile steel, permitting substantial savings of weight topside.

The Export Patriot stands ready for christening as **Laurence J. Buser,** president and chief executive officer of American Export Lines, addresses guests and dignitaries attending the launching.

Three of the Export Patriot's sister ships—the Sea Witch, Lightning, and Staghound—are currently operating on AEL's North Europe trade route.

The Export Leader, launched last July, will soon join the Export Freedom, launched last January, on AEL's full-container Mediterranean trade route.

Porter Coatings Establishes Five Operating Zones

Recent acquisitions by Porter Coatings, Louisville, Ky., of the marine and industrial coatings business of USS Chemicals include TARSET® INSUL-MASTIC® and TARMASTIC® lines and, from Bituminous Products, the widely known ZINC-LOCK® patented inorganic zinc.

Porter Coatings has further streamlined its entire sales/service organization into five operating zones with zone offices as follows: Kenilworth, N.J. (Northeast); Atlanta, Ga. (Southeast); Chicago, Ill. (North Central); Houston, Texas (South Central), and Emeryville, Calif. (Western).

To strengthen marine service capability, staff additions include **C. Peter Treleaven,** formerly of Devoe Marine, headquartered in Houston; **Eugene B. Rode,** formerly of Zinc-Lock, in Los Angeles, Calif.; and **Jack F. O'Neill,** formerly of Ameron Marine, in New Orleans, La.

Porter is now a full service source of specific high performance materials and services for marine and offshore trade.

Porter Coatings, Division of Porter Paint Co., general offices are located at 400 South 13 Street, Louisville, Ky. 40201.

Six Top Executives Promoted At TTT

Transamerican Trailer Transport, Inc., which, since 1968, has introduced the world's three largest and fastest roll-on trailerships in the Puerto Rican trade, has announced six key promotions in keeping with the "responsibilities that result with growth," according to **R.D. Carter,** TTT president.

At TTT's headquarters office in Staten Island, N.Y., **Paul Semack** has been appointed senior vice president - marketing; **Boleslaw Szolkowski,** senior vice president-operations; **Clifford G. Williams,** senior vice president-finance, and **D. Bernard Carr,** vice president-sales.

At the company's San Juan office, **Roberto Lugo D'Acosta** has been promoted to executive vice president-Puerto Rico, and **Rudy Irrizary,** vice president - Puerto Rico.

In announcing the appointments, Mr. **Carter** noted that they were the direct result of TTT's and Puerto Rico's continued expansion and growth over the past five years.

SNAME San Diego Section Hears Paper On Marine Sewage Control Equipment

Pictured at the meeting, left to right: **Melvin F. Good,** secretary-treasurer of the San Diego Section; **David R. Rodger,** Section vice chairman; **H.N. Wallin,** speaker; Comdr. **Raymond W. Bernhardt,** papers chairman, and **G.A. Uberti,** Section chairman.

The first meeting for the new year of 1973 for the San Diego Section of The Society of Naval Architects and Marine Engineers was held at Caesar's Restaurant in Mission Valley on January 17.

Following the social hour, **H.N. Wallin,** director of engineering of the Harbor Boat Building Company, Terminal Island, Calif., gave an excellent and informative paper on "Marine Sewage Control Plants, a Guide to Selection."

Mr. **Wallin's** presentation outlined the various methods of sewage treatment available and the types of marine sewage control equipment presently in use. Five basic sewage control processes were examined, along with the characteristics for an "ideal" marine sewage treatment control plant being defined to meet the new requirements and regulations to become effective in 1973 by the United States Coast Guard for vessels in U.S. navigable waters.

FIRST OF TWO FROM MITSUI: The 116, 570-dwt bulk/ore carrier Polyviking was recently delivered at the Tamano Works of Mitsui Shipbuilding & Engineering Co., Ltd. to her owner, Einar Rasmussen, Norway. Driven by Mitsui B&W 9K84EF type diesel engine with a maximum continuous output of 23,200 bhp at 114 rpm, the vessel has a cargo hold capacity of approximately 4,930,252 cubic feet, and a maximum trial speed of 17.86 knots. Her general dimensions are about 853 feet in overall length, 817 feet in bp length, 130 feet molded breadth, 74 feet in molded depth, and a full load draft of 54 feet. The Polyviking is the first of two similar carriers ordered by the same owner from Mitsui.

ANOTHER PLUG FOR THE TRADE DRAIN.

For U.S. vessels to compete successfully with foreign-flag ships for the carriage of U.S. foreign trade, they've got to be highly productive.

Converting break-bulk freighters into containerships is an effective way of making them more productive.

And that's exactly what Lykes Lines asked Todd to do for 13 of their freighters.

Hull-cutting, plug construction and reassembly add 97 feet to each vessel, enabling them to transport 166 containers in addition to break-bulk cargo.

The Lykes awards bring to 62 the number of freighters for which Todd has received conversion contracts from U.S. flag operators during the past decade. Which is kind of a nice "plug" for Todd.

Talk to TODD

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World's Biggest Ship Delivered To Globtik Tankers

The 477,000-dwt Globtik Tokyo, the world's largest tanker, built by the Kure Shipyard of IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.) for Globtik Tankers Ltd., the U.K., recently completed her sea trials.

Her first trial run (preliminary sea trials) was made in the Iyonada Sea off Ehime Prefecture, and the Hyuganada Sea off Miyazaki Prefecture, for test operations and adjustment of machinery and equipment on board.

The official sea trials were held from January 25 to January 31 in the sea off the Fukuejima, Nagasaki Prefecture for speed test, turning test, and final adjustment of machinery and equipment.

The Globtik Tokyo was delivered to her owner on February 20, and then chartered to Tokyo Tanker Company for hauling crude oil from the Persian Gulf to the Nippon Oil Group's central terminal station (CTS) at Kiire in Kagoshima Prefecture.

Construction on the Globtik Tokyo was started in April 1972 at Kure Shipyard, and she was launched in October of the same year.

The ship is approximately 1,244 feet in overall length, and about 105 feet longer than the 372,000-dwt Nisseki Maru, the world's largest tanker now in service. The height from the ship's bottom to the top of the funnels is about 230 feet, equivalent to that of a 20-story building. She is capable of carrying about 580,000 kiloliters of crude oil on a single voyage.

Approximate measurements and principal particulars of the Globtik Tokyo are: length overall, 1,244 feet; breadth molded, 204 feet, and depth molded, 118 feet. Her main engine is a 45,000-shp IHI turbine, with a service speed of 15 knots. The maximum complement is 50, and the cargo holding capacity is about 20,518,-363 cubic feet.

Marathon Manufacturing Co. Announces Four Promotions

Eldon P. Nuss

David C. Crawford

James L. Fox

Forrest R. Qualls

Wayne D. Harbin, president and chairman of the board of Marathon Manufacturing Company, Houston, Texas, recently announced the elections of **Eldon P. Nuss** as executive vice president and **David C. Crawford** as senior vice president of the company, and the appointments of **James L. Fox** and **Forrest R. Qualls** to vice presidents.

Prior to his appointment, Mr. **Nuss** served as senior vice president of the company. He joined Marathon Manufacturing in 1969 after 14 years with Arthur Young & Company, during which time he advanced through progressive management responsibilities to principal in the CPA firm's Houston office. Mr. **Nuss,** a native of Waterloo, Iowa, graduated from the University of Iowa with honors, and also from the Harvard Graduate School of Business Advanced Management Program.

Mr. **Crawford** has been associated with Marathon since 1971 and will continue to serve as president of Marathon LeTourneau Offshore Pte., Ltd., Singapore, a subsidiary of Marathon. Mr. **Crawford,** a graduate of Norwich University where he earned his B.S. degree, and of the University of Illinois where he earned his M.S. degree, was formerly associated with Levingston Shipbuilding Company.

Mr. **Fox** has been employed by the company since 1946. In 1972, he was elected president of Marathon Shipbuilding Company (U.K.) Limited, a subsidiary of Marathon located in Clydebank, Scotland. Mr. **Fox** will remain in Scotland and continue as president of the Marathon subsidiary.

Mr. **Qualls** is a 30-year veteran of the railroad traffic and manufacturing industry. He is an alumnus of Southern Methodist University. Mr. **Qualls** joined Marathon Tank Car Company in 1962. Marathon maintains plants at Sheldon, Angleton, and Houston, Texas for the manufacture and repair of railroad tank and hopper cars. Mr. **Qualls** will remain as president of Marathon Tank Car Company.

Marathon Manufacturing Company is the world leader in the manufacture of self-elevating mobile offshore drilling platforms with divisions in Vicksburg, Miss., Brownsville, Texas, and Clydebank, Scotland, as well as Singapore. Marathon also manufactures industrial metal products, electrochemical products, and household products.

Hongkong United Dockyards

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HUD

Three Firms File For Construction Loans To Build 13 Vessels

The U.S. Maritime Administration has received applications for Federal financing loan guarantees on the construction of a Great Lakes bulk carrier, two towboats, six petroleum barges and four tugboats, totaling more than $22 million.

Fulton Steamship Co., a subsidiary of American Steamship Co., New York, N.Y., filed an application for construction loan guarantees to build a $14.5-million bulk carrier to operate as a unit of American's existing fleet on the Great Lakes. It would be built by Bay Shipbuilding Corp., Sturgeon Bay, Wis., at an estimated cost of $14.5 million. It would have a 704-foot overall length and a deadweight capacity of 28,600 tons.

Application for loan guarantees to aid in financing the construction of two 4,200-hp towboats and six petroleum barges was made by Central Marine Corp., New Orleans, La. The towboats would be constructed by Nashville Bridge Co., Nashville, Tenn.; and Ingalls Iron Works Co., Decatur, Ala., would build the barges. Overall cost of the equipment was estimated at $3.9 million. Central Marine said the towboats and barges would be used on the U.S. inland waterways system.

Robin Towing Corp., Harvey, La., has applied for Federal loan guarantees to aid in the construction of four 4,860-hp tugboats. The vessels would be built by J. Ray McDermott & Co., Inc., Morgan City, La., at a cost of $3.9 million and, according to Robin Towing, would be used in the Gulf of Mexico, the Caribbean and the North Sea.

Bremer Vulkan To Build Five More U.L.C.C.s Of 320,000-Dwt Type

Bremer Vulkan, Bremen, West Germany, has announced that the yard has received five more orders of the 320,000-dwt large tanker type. At the end of last year, three units had been booked, and recently, two ships of that type were completed. The building program now looks as follows:

Owner	Delivery	Yard No.
Shell Group	1974	990
Shell Group	1974	991
Shell Group	1975	992
Norwegian Owner	1975	983
Norwegian Owner	1975	984
C.Y. Tung Group	1976	993
C.Y. Tung Group	1976	994

All the ships are of the "Trans World U.L.C.C." type, a name used to point up the universal use of this kind of vessel and a new class of size. U.L.C.C. means "Ultra Large Crude Carrier," a designation that has been used in Japan for tankers above 300,000 dwt. (It is common to use V.L.C.C. (Very Large Crude Carrier) for vessels below 300,000 dwt.)

The "Trans World U.L.C.C." is not too large a ship, enabling it to call on many ports (the number decreases rapidly for larger vessels). In ballast, the ship's passage through the Suez Canal will be possible when the Canal is reopened and brought up to present-day technical demands.

The carrier's draft of 72 feet meets the conditions which will be available within a few years in Rotterdam—an important factor in making this type of vessel suitable for independent shipowners. The above seems to be the reason that the bigger types of ships offered by the yard—for instance, vessels with 380,000 dwt on the same draft—have not met the same interest as the 320,000-dwt type. The latter has been designed in cooperation with the well-known yard Harland & Wolff in Belfast. Harland & Wolff has four orders of this type. Also, other yards have quite a number of similar tankers on order.

Because of continued interest, Bremer Vulkan intends to extend the series to about 10-12 ships, and then to design a new type. What this type will look like depends upon market developments. Bremer Vulkan is able to build ships up to 450,000 dwt in its dock. If necessary, however, the dock could be enlarged without difficulty so as to have two building places for ships up to one million dwt.

Besides the series of tankers, Bremer Vulkan continues with its program of special ships, in particular containerships. These "smaller" ships will keep the yard busy until 1975, and prospects for further orders are good.

General Dynamics' Electric Boat Division Appoints M.C. Curtis

M.C. Curtis

M.C. (Mel) Curtis has been appointed deputy general manager of General Dynamics' Electric Boat Division, Groton, Conn., **Joseph D. Pierce,** vice president of General Dynamics and general manager of the division, has announced.

Mr. **Curtis** has been, at different times, vice president and general manager of the Fort Worth, Texas, and San Diego, Calif., operations of the company's Convair Aerospace Division and has held the top manufacturing position at Canadair Limited, General Dynamics' Canadian subsidiary.

"We are confident that Mr. **Curtis's** extensive experiences in the production of highly technical products will contribute greatly to the performance and growth of the Electric Boat Division," Mr. **Pierce** said. "His proven management abilities will greatly enhance our management team."

When named to the Electric Boat position, Mr. **Curtis** was vice president and general manager at the San Diego operation of Convair, where the company produces DC-10 fuselages under subcontract to McDonnell Douglas Corp., and Atlas and Centaur space boosters for the Air Force and NASA.

Mr. **Curtis** became vice president and general manager at San Diego in April 1971, after serving as general manager at Fort Worth, where he had also been vice president, operations, and responsible for manufacture of the F-111 aircraft.

Following graduation from Northern Illinois College, Mr. **Curtis** joined the company as an engineer in 1951 at San Diego. In 1961, he became director of engineering at Convair, and two years later was transferred to the corporate office as director of program analysis and evaluation.

In 1965, Mr. **Curtis** was named vice president, operations, at Canadair and in 1967, was made a vice president at Fort Worth.

Boise-Griffin Names 3 To Operations Posts

Boise-Griffin Steamship Co., Inc., New York, N.Y., has announced the appointment of **Dennis J. Brennan** as manager of the operations department.

In addition, **John A. Griffin** and **Alan T. Hicks** have been appointed assistant operations managers.

Samson Cordage Buys Ocean Systems, Inc.

Union Carbide Corporation and The Singer Company recently announced that they had sold their interests in Ocean Systems, Inc., to Samson Cordage Works of Boston.

Organized in 1965, Ocean Systems was owned approximately 72 percent by Union Carbide and 28 percent by Singer. Ocean Systems provides worldwide commercial diving services to the offshore petroleum industry, marine surveying expertise, and the design and development of marine-oriented equipment, such as oil containment, collection systems, and mooring winches. The firm is headquartered in Reston, Va., and has facilities in Louisiana, Texas, California, Australia, England, and Norway.

Samson Cordage Works, established in 1884, is a leading manufacturer of cordage and related marine hardware. **Charles H. Abbott,** president, indicated that in acquiring 100 percent ownership, he plans no changes in the existing Ocean Systems organization.

Furthermore, Mr. **Abbott** indicated that the acquisition of Ocean Systems was designed to provide a larger, more diversified service and product line in the important expanding field of offshore exploration, engineering, and general marine activity.

New Flat Tank System For LNG Containment Approved By Lloyd's

Lloyd's Register of Shipping has given approval to plans submitted by Ishikawajima-Harima Heavy Industries. Co., Ltd. of Japan for a proposed single - screw 125,000 - cubic - meter LNG ship embodying separate semimembrane IHI flat plate-type tanks.

The ship is of double-skin construction with machinery and accommodation fitted aft, and with six cargo tanks. Dimensions are approximately 892 feet length by 151 feet breadth by 97 feet depth, and the design draft is about 39 feet.

The primary barrier of the IHI tank system employs aluminum alloy plates, 15-25 mm thick, which have sufficient tensile and fatigue strength and ductility at cryogenic temperatures down to minus 162° C. Thermal contraction and expansion, and deflection due to liquid pressure, are catered for by the special sectional form of the curved edges and corners of the tank. The secondary barrier and insulation system consists of a 25 mm thick plywood barrier backed up by a framework of main and subjoists. The spaces between the joists are filled with phenolic foam and polyurethane foam insulation, and the main joists are connected to the inner hull. By this means, the static and dynamic pressures on the tank are transmitted through the secondary barrier and insulation system to the main hull of the ship.

Means of heating are provided in the double-skin construction and in the transverse bulkhead cofferdam so that the temperature of the inner deck, sides, bottom and transverse bulkhead plating may be kept above 0° C.

This is the seventh LNG containment system approved by Lloyd's Register. The others are the Gaz Transport, Technigaz and Conch Ocean (membrane-integral types), the Conch (independent type), the Bridgestone (semimembrane / semi-independent type), and the Moss Rosenberg (spherical tanks supported on skirts [independent type]).

Lloyd's Register has also approved the Shell system of internal insulation developed for the carriage of LPG, in which the cargo is contained remote from the hull by polyurethane which is sprayed directly onto the inner hull.

The Society is active in research matters affecting the carriage of LNG by sea, and has made considerable progress in the prediction of the forces involved in the movement of liquids in closed tanks—a factor of particular significance to those systems which rely on the transmission of loads to the hull via load-bearing insulation.

On the international level, Lloyd's Register is collaborating with IMCO on the production of a code of practice for LNG ships, and is simultaneously engaged in revising and updating its own Rules for Liquefied Gas Ships.

USCG Gives Lockheed $54-Million Contract For Second Icebreaker

A $54-million contract for the construction of a second Coast Guard icebreaker has been awarded Lockheed Shipbuilding & Construction Co., Seattle, Wash. The keel of the new icebreaker, a sister to the Polar Star to be launched the middle of this year, will be laid next fall, with delivery scheduled for early 1976. These ships, which will be the world's most powerful icebreakers, are powered by three gas turbines developing 60,000 hp and six diesels capable of producing an additional 18,000 hp, and having a displacement of 11,000 tons.

New Bulk Carrier Consortium Announced

The formation of a bulk carrier consortium, involving associates of Rethymnis and Kulukundis, Ltd. of London, and Star Shipping A-S of Bergen, Norway, has been announced in New York by Star Shipping, Inc., general agents. Consisting of craned bulk carriers of about 26,000 deadweight tons, the new consortium will be marketed under the Star name and managed by Star Shipping A-S of Bergen. The announcement said that the company expects to have at least 14 vessels in operation by mid-1974, with trading principally between the Pacific basin and the American and European markets.

Sun Shipbuilding And Dry Dock Co. Names Swensson, Brodhead And Watson

Gerald C. Swensson

G. Wills Brodhead

William Watson

Sun Shipbuilding and Dry Dock Co., Chester, Pa., has appointed **Gerald C. Swensson, G. Wills Brodhead** and **William Watson** to executive posts in the company's Bulk Cargo Ship Product Group. Mr. **Swensson** has been named engineering manager, Mr. **Brodhead,** marketing manager, and Mr. **Watson,** projects manager. The three executives will report to **Kjeld Damsgaard,** vice president, Bulk Cargo Ship Product Group.

Mr. **Damsgaard** said his Product Group would be responsible for tankers, liquefied natural gas (LNG) carriers, specialty vessels and all other types of ships carrying bulk cargo on the trade routes of the world. The new group will combine marketing and transportation research with engineering and product development to give Sun Ship's customers the most competitive, profitable vessels possible.

As engineering manager, Mr. **Swensson** will be responsible for the conceptual and preliminary design of bulk vessels in the naval architectural, structural, and engineering areas.

Mr. **Brodhead** will be responsible for directing the activities of the Bulk Vessels Marketing Group.

Mr. **Watson,** as projects manager, will be responsible for the Bulk Vessels Contracts Group, the estimating staff, and business administration.

Mr. **Swensson,** who was born in Chicago, Ill., is a 1944 graduate of the Massachusetts Institute of Technology, with a B.S. degree in naval architecture and marine engineering. He was awarded an M.S. degree in marine engineering from the same school in 1949.

He was assistant chief engineer with Bethlehem Steel Corporation's Shipbuilding Division at Quincy, Mass., before joining Sun Ship in 1964 as head of the mechanical design department.

Mr. **Swensson** is a member of The Society of Naval Architects and Marine Engineers, and the American Society of Mechanical Engineers.

Mr. **Brodhead** was born in Philadelphia, Pa., and attended the University of Pennsylvania and Penn State University evening school.

He joined Sun Ship in 1936 and worked in the shipyard's heavy machine shop until 1942, when he transferred to the ship repair estimating department. In June 1961, he was named manager of ship repair sales.

He is past president of the Port of Philadelphia Maritime Society and a member of The Society of Naval Architects and Marine Engineers and the Philadelphia Maritime Exchange.

Born in Paisley, Scotland, Mr. **Watson** is a 1951 graduate of the Royal Technical College in Scotland.

He was chief marine engineer for National Steel and Shipbuilding Company in San Diego, Calif., before joining Sun Ship in 1962 as manufacturing engineer. In 1969, he was named chief, staff engineering, and his duties were expanded to include management of new construction estimating, contract administration and the Aero/Hydro Space Division. During this period, he was Deep Submergence Rescue Vehicle Program manager and project manager for the shipyard's conversion of the S/S Manhattan to an icebreaking tanker.

Mr. **Watson** is a committee member of the American Bureau of Shipping Technical Committee for Submersibles, the Technical Committee of Lloyd's of London, the Ocean Resources Committee of the Marine Technology Society, and the Value Analysis Committee of Shipbuilder's Council of America. He is also a member of The Society of Naval Architects and Marine Engineers, and the Institute of Marine Engineers.

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MARINE ENGINEERING/LOG

OCCUPATIONAL BREAKDOWN OF TOTAL CIRCULATION

		BUYING POWER
SHIPBUILDING & SHIP REPAIR COMPANIES		
Companies, Presidents, Vice Presidents, Secretaries, Treasurers, General Managers & Purchasing Agents		1,981
Works Managers & Superintendents		229
Naval Architects, Marine Engineers, Chief Draftsmen		907
Shipbuilding & Ship Repair Personnel (Draftsmen, Foremen, Inspectors & Others) not included in above classification	551	
SHIP OPERATING COMPANIES, OWNERS, AGENTS & BROKERS:		
Companies, Presidents, Vice Presidents, Secretaries, Treasurers, General Managers, Purchasing Agents, Passenger & Freight Agents		2,842
Marine Superintendents, Port Captains, Port Engineers, Port Stewards		1,265
Deck Captains, First, Second & Third Mates Only	2,491	
Engine Room Chiefs & Licensed Assistants	3,649	
Ship Operating Personnel Ashore & Aboard not included in above classifications	406	
PROFESSIONAL MEN:		
Naval Architects & Marine Engineers		1,386
Admiralty lawyers	25	
Insurance Companies, Agents & Brokers	55	
NAVY	359	
MARINE SUPPLIES & EQUIPMENT: Manufacturers	1,707	
Ship Chandlers, Dealers & Agents	73	
Bunkers (Coal & Fuel Oil)	14	
ALLIED MARINE INDUSTRIES:		
Freight Agents & Forwarders	1	
Exporter & Importers	8	
Stevedoring Companies not owning Floating Equipment	20	
Government Schools, Libraries, Students & Commercial Organizations	928	
Miscellaneous	834	
Awaiting Classification by Business & Industry	28	
NON BUYING POWER	11,149	

WORLD WIDE BUYING POWER TOTAL 8,610

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MARITIME REPORTER/Engineering News

OCCUPATIONAL BREAKDOWN OF TOTAL CIRCULATION

	BUYING POWER
SHIPBUILDING & SHIP REPAIR (Commercial, U.S. Navy and U.S. Coast Guard):	
Companies, directors, owners, presidents, vice-presidents, secretaries, treasurers, superintendents, managers and purchasing agents	3,757
Naval architects, engineers and chief draftsmen	1,141
Other employees (draftsmen, inspectors, foremen and others employed by shipbuilding and repair companies) not included in above classifications	99
VESSEL OPERATING COMPANIES– OCEAN, RIVERS, HARBORS, OFFSHORE OIL DRILLING AND RELATED OPERATIONS	
(Owners, Agencies & Brokers) Companies, directors, owners, agents, presidents, vice-presidents, managers, secretaries and treasurers	5,429
Port engineers, superintendents, purchasing agents, port captains, port stewards, naval architects and engineers shoreside	1,637
Other employees ashore not included in above classifications	43
PROFESSIONAL MEN:	
Naval architects, engineers and consultants shoreside	1,595
Admiralty lawyers and insurance	18
MARINE SUPPLIES & EQUIPMENT:	
Manufacturers, dealers and agents	1,616
Ship Chandlers	172
Allied marine industries	295
GOVERNMENT:	
U.S. Maritime Administration, U.S. Senators, U.S. Congressmen and others in official capacities	36
SCHOOLS, LIBRARIES AND ORGANIZATIONS	47
NON BUYING POWER	2,326

OUR ENTIRE CIRCULATION IS OVER 97% **READER REQUEST** IN WRITING.

WORLD WIDE BUYING POWER TOTAL 13,559

REACHES THOUSANDS MORE SHORESIDE BUYERS THOUSANDS MORE IN THE BIG AMERICAN MARKET.

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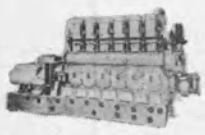
Main Office: (301) 539-1900 Marine Dept.: (301) 355-5050

DIESEL GENERATOR SETS

250 KW DIESEL GENERATOR SET

1



ENGINE: Enterprise 12 x 15 DSG-6—6 cyl.—450 RPM crank No. 50J. GENERATOR: Westinghouse 250 KW—120/240 DC—1040 amps—450 RPM. Typical serial No. 3S-10P-913. Complete with switch gear.

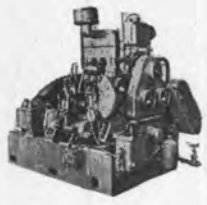
EMERGENCY GENERATOR SUPERIOR 75KW 120/240 VOLT D.C. DIESEL GENERATOR SET

2

With switchgear. ENGINE: Radiator cooled Superior GBD-8—6 cylinder—1200 RPM GENERATOR: Electric Machinery Co.—120/240 volts DC—316 amps—1200 RPM—stab. shunt.

UNUSED 10 KW SUPERIOR DIESEL GENERATOR SET

3



GENERATOR: Delco 10 KW—120 VDC—83.3 amps—1200 RPM. ENGINE: Superior diesel—2 cyl.—4½x5¾—15 HP—heat exchanger cooled.

500 KW—120/240 VOLT DC DIESEL GENERATOR SET

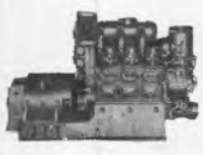
4

GENERATOR: Allis Chalmers—Compound wound. Has Class "A" insulation. Output 500 KW—120/240 volts DC—2080 amperes—720 RPM—drip-proof—self-cooling. Ambient 50°C—temperature rise 40°C. ENGINE: Model GM 8-278—2-cycle—Vee type—8½"x10½"—air starting—720 RPM. Complete with switchgear. Condition very good. Still aboard naval vessel.

TURBO GENERATOR SETS

300 KW DIESEL GENERATOR SET

5



ENGINE: G.M. 6-278—6-cylinder—2 cycle—8¾"x10½"—750 RPM—with oil and water Ross Shell and Tube Heat Exchangers, instrument panel, pyrometer, etc. Vibro Isolators. GENERATOR: G.E. 300 KW—120/240 volts DC—1250 amps—shunt wound—continuous overload rating 375 KW—2 hours—55° Weight of unit approximately 26,000 pounds. Complete with shock mounts. Unit 13' 2" long, 64" wide, 8' high.

UNUSED 300 KW—240 VOLT DC WESTINGHOUSE LOW-PRESSURE TURBO-GENERATOR SET

6

GENERATOR: 300 KW—240 VDC—1250 amps—1200 RPM. GEAR: 5286/1200—frame 6x15—serial 10A-2612-4. TURBINE: Frame C-325—225 PSI—397° TT—5286 RPM—Serial 10-A-2611-4. Wt. 16,700 lbs.—complete in original fatcory crate.

WESTINGHOUSE 440/3/60 200 KW UNIT

7

GENERATOR: Westinghouse 200 KW—250 KVA—450/3/60—1200 RPM—80% PF—with 40 KW—120 VDC on same shaft. GEAR: 9989/1200 RPM—double helical. TURBINE: Westinghouse—540 PSI—superheat 322°F. Test 930 PSI 800°TT. Also operates 615 PSI—850°TT.

6 EQUAL-TO-NEW LATE TYPE 500 KW SHIPS SERVICE TURBO GENERATORS

8

1962—DeLaval. Very little use. Completely preserved with rotors and diaphragms crated separately. TURBINE: DeLaval—585 PSI—840°TT—6-stage—6391 RPM—class CD—Also suitable 440 lbs.—740°TT—25" vac. GEAR: 6391/1200 RPM. GENERATOR: Allis-Chalmers—450/3/60. Totally enclosed, with static exciter and voltage regulator system. Weight 17,665 lbs. Complete with latest dead front switch gear. Also available are the condensers, circulating and condenser pumps. All very up-to-date, compact construction. Turbines will easily handle 600 KW if up-grading is desired.

UNUSED 300 KW—120/240 VOLT DC G.E. TURBO-GENERATOR SET

9

GENERATOR: 300 KW—120/240 VDC—1250 amps—1200 RPM. REDUCTION GEAR: 8.344:1—10012/1200 RPM—type S-182. TURBINE: DOR418N—449 H.P.—10012 RPM—working pressure 180/220 PSIG.

1250 KW G.E. 10-STAGE TURBO GENERATOR SET

10

TURBINE: 525—615 PSI—850°TT—7938 RPM—10-stage—type FSN. GEAR: Single helix—7938/1200. GENERATOR: 1250 KW—450/3/60/3600—.80 PF—type ATB with surface air cooler. Overload 25%—2 hours—1563 KW.

AP2 VICTORY WORTHINGTON-MOORE CROCKER-WHEELER 300 KW UNIT

11

TURBINE: 440 PSI—740°TT—28½" vacuum—type S4—5-stage—6097 RPM—serial 7547 & 7548. GEAR: 6097/1200. GENERATOR: 300 KW—120/240 volts DC—1250 amps—compound wound—973643—999759. Armature flange 8½"; B.C. 7"—12 holes. ALSO NEW ARMATURES IN STOCK & 300 KW SHUNT ARMATURES.

VICTORY 300 KW WESTINGHOUSE TURBO GENERATOR SET

12

440# — 740°F — 5930 RPM — 2A-9794-15-16-17 — coupling non-recessed on steam end of pinion—5¾". GENERATOR: Westinghouse 300 KW—120/240 DC—1250 amps—1200 RPM—C.B. 208.4.

UNUSED

CROCKER-WHEELER

500 KW

GENERATOR ENDS ONLY

120/240 VOLTS D.C.—1200 R.P.M.

FORMERLY USED WITH WORTHINGTON-MOORE TURBINES & GEARS

13

Upgraded by U.S. Navy—rewound in glass. Generator Frame and Armature—Marine 500 KW type 3-1200—dripproof enclosure—base mount. Modified from Crocker-Wheeler generator frame 152HD—240/120 volts DC—2083/521 amps—1200 RPM. Ambient temperature 50°C. APPLICATION: For C-4-SA1;C-4-SA-3;T-AP-134 vessels, using Worthington-Moore Turbine—Form S-6 and generator Form 14 x 10.

TURBINES & ROTORS

MAIN PROPULSION

19 STAGE WESTINGHOUSE H.P. ROTOR FOR AP2 VICTORY

14

Reconditioned—balanced—with ABS. Serial 4A-2079—type B—19 stage reaction blades. Excellent—just out of shop. 13" Flange diameter with 14 bolts.

SPECIAL !

1 WESTINGHOUSE COMPLETE T-2 MAIN TURBINE

15

PROFILE (UNSHROUDED)

6600 HP—435 PSI—750°F

28" VAC.—3720 RPM

Instruction Book 6893—Serial #2A-9361-21. The turbine rotor blades, stationary blading, diaphragms and nozzles are all in unusually good condition.

IMMEDIATE DELIVERY—WITH ABS

8500 H.P. G.E. TURBINE

16

G.E. Instruction book GEI16263—from ex-Navy Victory. L.P.—8-stage—3509 RPM—77943 H.P.—8-stage—6159 RPM—77942.

WILL INTERCHANGE WITH INGALLS C3 HULL—442 CLASS AND SUN-BUILT C4 VESSELS

NEW L.P. BLADE RINGS

for large 8500 H.P. Victory

17

Joshua Hendy Westinghouse

NEW 8500 H.P. G.E. TURBINES

Large Victory or Ingalls C3

18

L.P.—8-stage—3509 RPM—#72271
H.P.—8-stage—6159 RPM—#72272

ALSO AVAILABLE

U.S.M.C. RECONDITIONED SET

H.P. & L.P.

L.P.—8-stage—#77987—3509 RPM
H.P.—8-stage—#77994—6159 RPM
Interchange Ingalls C3

T2-SE-A1 MAIN PROPULSION ROTOR — G.E.

19

Large Schenectady — serial 77418—reconditioned Bethlehem Steel 1970—all stages magnafluxed.

2 COMPLETE G.E. TURBINES

20

#61818 and #61834—large Lynn—all stages magnafluxed.

WILL INTERCHANGE WITH ELLIOTT MAIN TURBINE

8500 H.P. G.E. — C-3 OR VICTORY

21

H.P.—8-stage—6159 RPM—serial 62043
L.P.—8-stage—3509 RPM—serial 62042
G.E.I. 16263

6000 H.P. G.E. — NORTH CAROLINA C-2

22

H.P.—8-stage—serial 78040
L.P.—7-stage—serial 78043
G.E.I. 16262

23 **VICTORY SHIP AP2 H.P. & L.P. TURBINES**
NEW — UNUSED — 6000 HP SETS
G.E.—H.P. & L.P.—with throttle valve
Westinghouse—L.P.—with throttle valve
Allis-Chalmers—H.P. & L.P.—with throttle valve

AUX. GEN. ROTORS AND ARMATURES

24 **250 KW & 300 KW ALLIS-CHALMERS ROTORS**

Typical serial No. 3067—will Interchange with most 250 KW & 300 KW Allis-Chalmers as Installed on Victory's and Moore C2-C3 vessels.

25 **300. KW 5965 RPM JOSHUA HENDY**

Turbine—3H-69	Gear—52269
Turbine—3H-52	Gear—52252
Turbine—3H-62	Gear—52262

AUX TURBINE ROTORS AND ARMATURES

26 **UNUSED—4 UNITS AVAILABLE**
T2 AUX. T2 TURBO GEN. ROTORS

DORV — 325M — 5645 RPM—for 525 KW G.E.

27 **ARMATURE**
Allis-Chalmers 300 KW armature — 120/240 volts DC—type MCW-213 (#138511-13819J generators).

28

G.E. 8500 H.P. REDUCTION GEAR FOR LARGE AP3 VICTORY & C3
MD-48A—8500 HP—6159/3509/763/85 RPM.

29 **ALSO 6000 H.P. VICTORY AP2 REDUCTION GEAR**
Westinghouse 4A-1640.

PUMPS

30

WORTHINGTON 16"x14"x18" VERTICAL DUPLEX STRIPPING PUMP

1400 GPM @ 110 PSI—suction lift 11.5 ft.—steam back pressure 15 lbs. 14" Suction — 10" Discharge — 2½" Steam — 4" Exhaust. Overall width 6'8"—Overall height 9'11½"—depth 3'9½"—wt. approx. 10,000 lbs.

31

NEW BLACKMER FUEL OIL TRANSFER PUMP
Rotary—50 GPM—50 lbs.—2"—5 HP—440/3/60—with starter & spares.

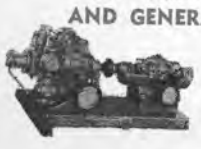
32

UNUSED BLACKMER VERTICAL ROTARY PUMP
4"—100 GPM—100 PSI—15 HP — 440/3/60 — gear head.

UNUSED AURORA PUMP

33 300 GPM—37' head—5 HP—120 volts DC Centrifugal Pump. Bronze—size 5x4—flanged. MOTOR: Reliance—super T.D.C. Electric Motor—5 HP—120 VDC—36.8 amps—1750 RPM—Frame L216A—with control by Cutler-Hammer. Excellent condition. Latest USN surplus.

34 **NEW TURBINE DRIVEN FIRE AND GENERAL SERVICE PUMP**



Allis-Chalmers 6x5 pump, type SKH—1200 GPM—125 PSI—3500 RPM. Coppos turbine type TF-22-2½ — 3500 RPM. 273#—50° superheat.

NAVAL VESSEL SECTION
FOR FLETCHER CLASS DESTROYERS

35

UNUSED DELAVAL 24.5 H.P. LUBE OIL PUMP

Turbine-driven main lubricating oil pumps — vertical rotary with horizontal worm geared turbine drive. 575# Steam pressure—5000 RPM —15# back pressure. GEAR: 5000/1035 RPM. PUMP: 550 GPM at 50 PSI—suction lift 10.0". Suitable for Fletcher Class Destroyer.

36

UNUSED SIZE 4 BUFFALO FEED PUMPS

Terry Turbine—BM—273 HP—550 RPM—exhaust 15 lbs—590 PSI—superheat 0°—425 GPM Buffalo Pump —discharge pressure 750 lbs—5" x 4"—built for USN DD destroyers.

37

UNUSED STEERING GEAR FOR ALL TYPES OF DIESEL & STEAM DESTROYER ESCORTS

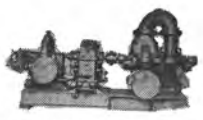
Mfg by Hyde Windlass Co. Two 10 HP 440/3/60 1750 RPM gear motors driving 1500 PSI hydraulic pumps. TORQUE: 1,005,000 lbs.—7½" diameter plungers—two power units with hand gear attachments—replenishing tank—6-way valve—differential control, etc.

ENGINE ROOM COMPONENTS
SUITABLE FOR BETHLEHEM SPARROWS POINT HULLS SERIES 4400/4500

38 **COMPLETE TURBINE OR ROTORS ONLY**
For Sparrows Point Hull 4518 — 29,000 GTDW — 13,600 HP @ 109 RPM; 15,000 HP @ 112 RPM—585 lb. 840°TT—28½" vacuum **H.P. TURBINE**—4688 RPM—Mfg Bethlehem—1630-H-9—**L.P. TURBINE** 2625 RPM—Mfg Bethlehem—#1630-L-9.

39 **WESTINGHOUSE 400 K.W. SHIPS SERVICE GENERATORS**
400 KW (500 KVA)—80% PF—1200 RPM—450/3/60. TURBINE: 585 lbs—840°TT—28½" vacuum—9018 RPM—serial 10A4462-3 & 10A4462-4. GEAR: 9018/1200 RPM. A.C. GENERATOR: 500 KVA—400 KW—450 volts—641 amps—80%PF—3 phase 60 cycle—1200 RPM—CR 40°—excitation amps 41—excitation voltage 120. Instruction book 5442. Switchgear available.

40



2 TURBINE DRIVEN CARGO PUMPS

WESTINGHOUSE C-25 TURBINE—Ingersoll-Rand 10GT pumps—500 HP—single-stage impulse turbine—455 lbs—590°TT—4 PSI exhaust pressure—frame C-25—Westinghouse 4540 RPM. Rotation CC when viewed from governor end. GEAR: 4540/1750 RPM: 4500 GPM at 125 PSI head—type 10 GTM—bronze 2-stage —14" suction—12" discharge.

41 **COFFIN CG-4A FEED PUMPS**
Max. 325 GPM—1760' head or 750 lbs. Steam inlet 575 lbs.—540°TT—exhaust 20 lbs.—speed 760 RPM.

42 **FIRE & BUTTERWORTH PUMPS**
Warren Pump—450 gallons Per Minute—449 ft—71 HP—type 3-TL-2. TURBINE: 71 HP—545 PSI—540°TT—15 lbs G exhaust—3500 RPM.

43 **SHARPLESS LUBE OIL PURIFIERS**
350 GPM—75 ft discharge head—20 ft suction lift —type AE 15 V. 1½ HP—440/3/60—3450 RPM—40°C temperature rise.

44 **ANCHOR WINDLASS**
Hyde 2-11/16" — 12x14 — 100 PSI — steam — 54,100 lbs.

45 **INQUIRE FOR ALL OTHER ITEMS**
Forced draft blowers, reduction gear parts, bilge and ballast pumps, main circulators, general service pumps, F.O. transfer pumps, lube oil service, standby feed pumps, condensate pumps, aux. circulating pumps, feed water heaters, wash water pumps, etc.

46

ALLIS-CHALMERS WINCH CONTROL PANEL

50 HP—230 VDC. Consists of motor control, magnetic breakers and resistor bank.

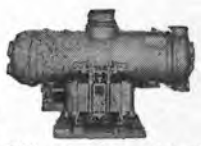
MISCELLANEOUS

47

3-TON CLYDE DOUBLE DRUM WINCH

3-ton double drum winch—10 HP—115 VDC—declutchable drums—with controls.

48



UNUSED 1135 SQ. FT. C.H. WHEELER CONDENSER

20" Ex. inlet—⅝" Cu-Ni tubes—with or without air ejector.

UNUSED 70 HP McKIERNAN-TERRY WINDLASSES

49 2¾" Chain and two 10640 lb anchor & 30 fathoms chain @ 30 FPM. 70 HP—230 volts—shunt DC motors—233 amps—550 RPM—55°C rise. Wildcat centers 47½". Base 9'5" wide x 11' long. Weight 36,000 lbs.

NEW—UNUSED LINK BELT WINDLASS

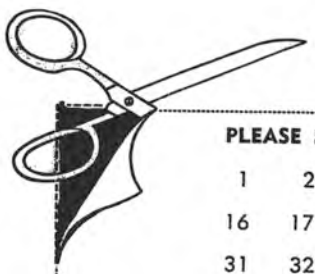
50 1⅝" and 7000 lb. anchors. 56" Centers—50 HP—230 VDC—spares.

IDEAL WINDLASS—UNUSED

51 1-5/16" Chain—36" Centers—15 HP—115 VDC—1750 RPM—6000 lb. line pull.

DOUBLE INPUT—SINGLE OUTPUT DIESEL REDUCTION GEARS

52 Farrell-Birmingham — 3200 SHP. Reduction gear: 1.81:1—handles two 1600 HP diesels @ 720 RPM. With hydraulic couplings & Fawick clutch. Port and starboard. Gear output 400 RPM. Suitable for Dredge Pumps.



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16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52								

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ADDRESS..... POSITION..... PHONE.....

CITY..... ZONE..... STATE.....

Eastern USA Branch, IME Hears Technical Paper On High-Powered Diesel Engines

At a recent meeting at the U.S. Coast Guard Officers' Club on Governors Island, N.Y., the Eastern USA Branch of the Institute of Marine Engineers heard a paper on "Recent Developments in High-Powered Diesel Engines."

Per V. Meulengracht, manager, Burmeister & Wain American Corporation, after a brief outline of the history of the B&W diesel engine, described their latest engine types.

Details of the new two-cycle B&W crosshead types designated K-GF, of which the K90-GF (900 mm bore) has been run on the test beds at Mitsui in Japan and at B&W engine works in Copenhagen, were discussed. This model develops 3,400 bhp per cylinder (MCR) at 114 rpm.

Illustrated by slides, design features were shown, of which the following are of particular interest:

Frame—The fabricated frame box resulting in a very rigid unit with few joints which insure good oil tightness.

Crosshead—For the short and rigid crosshead, the owner has a choice of either poured white metal bearings or precision shell-type bearings. As only the bottom half of the journals is subjected to bearing loads, the crosshead is designed so it can be turned upside down in case of wear or minor damage. The shell-type bearings are also reversible top to bottom.

Cylinder Head—The cylinder head is a steel forging with drilled passages for cooling, resulting in: short (uncooled) fuel injection valves and very limited thermal stresses.

Exhaust Valve—The one centrally located exhaust valve, which has for many years been standard on B&W (uniflow) two-cycle engines, is now hydraulically actuated, eliminating push rods and rocker arms.

Reversing Mechanism—Retiming (advancing) of the camshaft is accomplished through vane-type hydraulic motors built into the camshaft chainwheel.

Triple-Screw Containerships—The power plant in the 75,000-hp containerships recently completed in Copenhagen was described. In this connection please refer to the cover story in MARITIME REPORTER/Engineering News, December 1, 1972.

Medium-Speed Engines—A four-cycle medium-speed engine with 500 mm bore rated 750 bhp per cylinder (MCR) at 465 rpm, available with up to 18 cylinders (13,500 bhp), was also mentioned. The first two engines have been tested in Copenhagen. They are of the 18-cylinder V-type and will be coupled to one 20 MW AC generator for a peaking unit for an electrical power station.

Shown at the meeting, left to right: **Robert E. Yohe,** secretary, Eastern USA Branch, Institute of Marine Engineers, **Per V. Meulengracht,** author, and **Robert H. Imlah,** treasurer, Eastern USA Branch.

After the paper, a movie showing a piston overhaul carried out in 1½ hours by four men on a large bore (840 mm = 33") engine was shown, illustrating how quickly maintenance work can be carried out on large engines when using special hydraulic and pneumatic tools.

With the labor-saving devices developed for high-powered engines, and the relative ease with which they can be operated, unattended at night and on weekends (O-watch), the diesel engine, due to its fuel economy and high reliability, is excellently suited for practically all types of vessels, including the largest tankers.

Chromalloy Contracts For World's Largest Towboats With Dravo Corporation

Chromalloy American Corporation's marine subsidiary, The Valley Line Company, St. Louis, Mo., has announced a contract for over $5 million to build the world's two most powerful towboats. These boats will be built by Dravo Corporation at their manufacturing facility on Neville Island near Pittsburgh, Pa.

These vessels would each be rated at 10,100 horsepower, and will be the most powerful towboats operating on any inland waterway system. Completion of these vessels is scheduled for the end of the first quarter of 1974.

According to **Thomas J. Barta,** The Valley Line president, the new boats are designed to handle tows of over 40,000 tons in deeper channels and swifter waters, primarily operating on the Lower Mississippi River.

These vessels will have the latest safety and pollution equipment; included are inboard fuel bunkers, which eliminate river pollution in the event of a side puncture.

The Valley Line, one of the largest barge lines operating on the inland waterways, has a fleet of 20 towboats and 750 barges.

PACECO MACH Systems give you

50% MORE PRODUCTION NOW

MODULAR UNITS TO ADD AS YOU GROW

AUTOMATION WHEN YOU NEED IT

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Take a step into the future with basic MACH (Modular Automated Container Handling) Portainers® and Transtainers®. You'll get greater throughput, because these cranes are faster—they have hi-speed power packages and operate with less dependency upon the skill level of the operator.

Low cost automation modules can be added step-by-step as your volume increases to maximize the return on your investment and minimize the obsolescence factor.

Automation providing the lowest cost per container handled will be available when you need it with Paceco's MACH system. Don't buy cranes that are already obsolete. Plan on MACH.

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Great Lakes/Rivers Section Hears Three Technical Papers At Meeting In Cleveland

Authors participating in the meeting, left to right (standing): **Bengt M. Johansson,** Oy Wartsila Ab. Helsinki Shipyard; **Paul B. Mentz,** Office of Advanced Ship Operations, U.S. Maritime Administration; **Eero Makinen,** Oy Wartsila Ab. Helsinki Shipyard; **Anthony Atkins,** department of mechanical engineering, The University of Michigan; (seated) **Horst Nowacki** and **Harry Benford,** department of naval architecture and marine engineering, University of Michigan.

The winter meeting of the Great Lakes and Great Rivers Section of The Society of Naval Architects and Marine Engineers was held at the Hollenden House, Cleveland, Ohio, on January 25, 1973. About 150 members and guests were in attendance.

Following the usual morning business meeting, papers were presented as follows: "The Maritime Administration's Commercial Ice Transiting Marine Transportation Systems Program," by **Paul B. Mentz,** Research and Development Program Manager, Office of Advanced Ship Operations, U.S. Maritime Administration; "Systematic Variation of Bow Lines and Main Dimensions of Hull Forms Suitable for the Great Lakes," by **Bengt M. Johansson** and **Eero Makinen,** Oy Wartsila Ab. Helsinki Shipyard; and "Economics of Great Lakes Shipping in an Extended Season," by **Horst Nowacki** and **Harry Benford,** department of naval architecture and marine engineering, and **Anthony Atkins,** department of mechanical engineering, The University of Michigan.

During the afternoon, the group toured the U.S. Coast Guard Ninth District Ice Center and Information in the Federal Building. This was followed by a common reception for all attendees, and the dinner. Many interesting papers were presented, as noted above, and major decisions were made regarding the Great Lakes and Great Rivers Section hosting the Spring Meeting in 1974.

The next scheduled meeting of the Great Lakes and Great Rivers Section will be held in Erie, Pa.

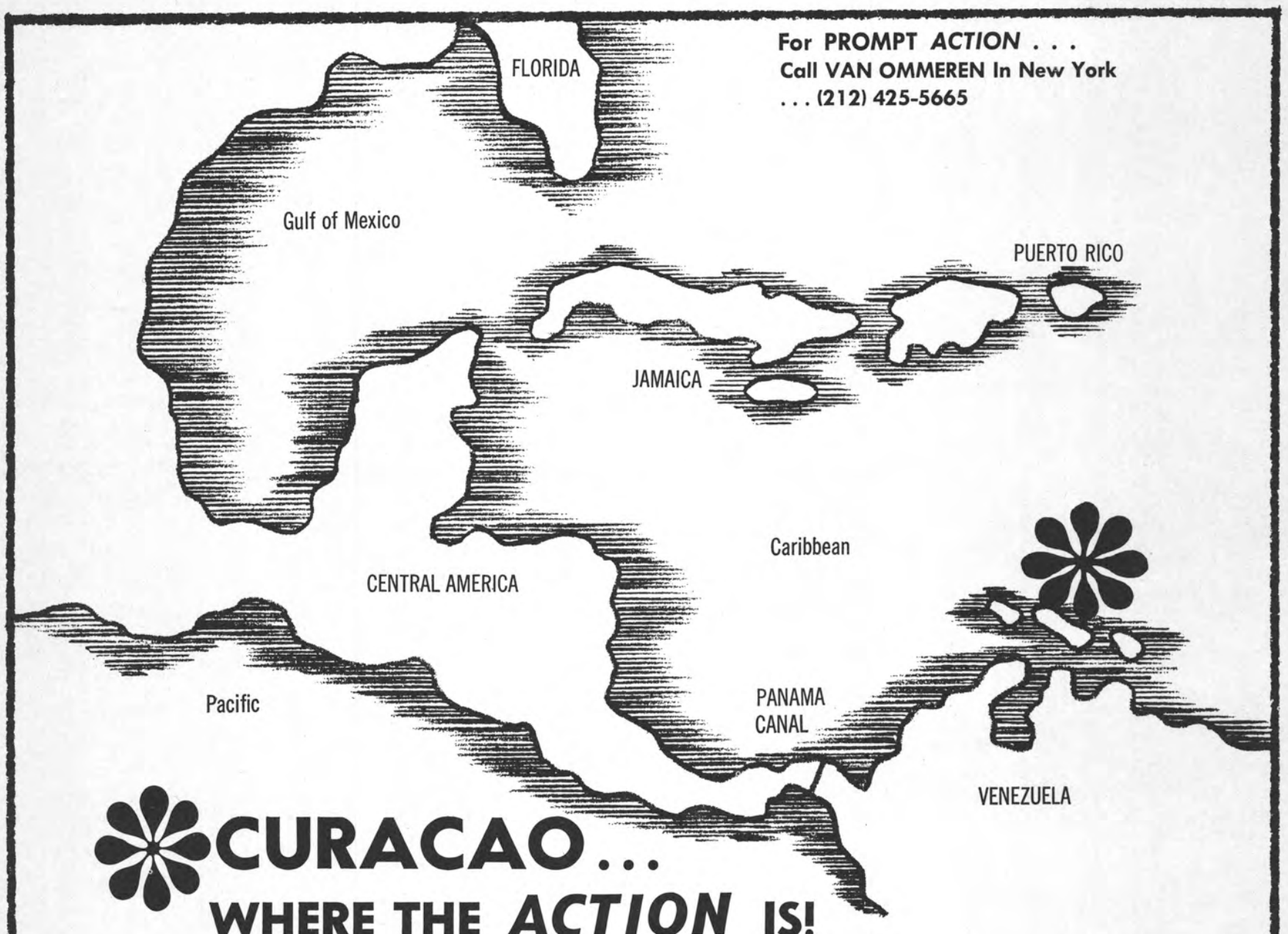
Towboat And 24 Hopper Barges Ordered From St. Louis Ship

Sioux City and New Orleans Barge Line, Inc. of St. Louis, Mo., has awarded a contract to St. Louis Ship, Division of Pott Industries Inc., St. Louis, Mo., for one twin-screw 7,000-hp Hydrodyne towboat and 24 covered hopper box barges.

The new towboat will be 166 feet by 45 feet by 11 feet, with Kort nozzles, and be of the same class as several other recently delivered towboats.

The barges will be 200 feet by 35 feet by 12 feet, with a 4-foot coaming and corregated rolling steel covers.

Delivery of all equipment will be made during 1973.



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ITEL To Arrange First American LNG Ship Lease Transaction

Universal Gas and Oil Company, Inc., 122 East 42nd Street, New York, N.Y. 10017, has selected ITEL Leasing Corporation, a subsidiary of ITEL Corporation, One Embarcadero Center, San Francisco, Calif. 94111, to arrange a lease transaction involving a 35,000-cubic-meter liquefied natural gas vessel under long-term charter to UGO.

The vessel, costing approximately $40 million, is being built at Constructions Navales et Industrielles de la Mediterranee, La Seyne, France. Delivery is expected the first half of 1974.

Upon completion of the lease transaction, the vessel is expected to operate under the American flag, and is likely to be the first such liquefied natural gas vessel to come into the American merchant fleet.

ITEL Leasing has agreed, in a letter of intent, to use its best efforts to structure and arrange the financial transaction. ITEL Leasing has extensive experience in arranging large-scale full-payout leveraged lease financing for major transportation, industrial and utility companies.

Universal Gas and Oil Company, Inc. will engage primarily in the transportation of liquefied gases. The vessel involved in this proposed transaction is one of four liquefied gas vessels, on order or charter to the company, scheduled for delivery by the end of 1974. In addition, Universal Gas and Oil owns various oil, gas, and hard mineral exploration rights.

C.Y. Tung Orders Two Huge Tankers From Bremer Vulkan

C.Y. Tung has ordered two 320-000-dwt tankers from Bremer Vulkan Shipyard, West Germany, according to reports from Hong Kong. The ships, scheduled for delivery in April and August 1976, will be the largest in Mr. **Tung's** fleet, although it is said that he is also negotiating for another vessel of between 400,000 and 500,000 deadweight tons.

Other reports indicate that the Island Navigation Corp., part of the Tung Group, is discussing the building of a 371,000 tonner with Sumitomo Shipbuilding & Machinery Co., Ltd.

Dravo Appoints Two To Managerial Posts

Dravo Corporation of Pittsburgh, Pa., has announced two personnel appointments in its Eastern Construction Division.

William L. Horstman, former engineering manager for the division, has been appointed manager of business development. **Robert L. Watson Jr.,** previously estimating and cost manager, has been named engineering manager.

Mr. **Horstman,** who joined Dravo in 1947, will take responsibility for new business activities in marketing and development. A civil engineering graduate of Iowa State College, he is a member of the American Society of Civil Engineers, Society of Military Engineers, and Engineers' Society of Western Pennsylvania. He is a registered professional engineer in Pennsylvania.

Mr. **Watson,** who joined Dravo in 1953, will have responsibility for engineering, estimating, cost control and contract administration for the division. A graduate in civil engineering at the University of Illinois, he is a registered professional engineer in Pennsylvania and Illinois.

Dravo's Eastern Construction Division is involved in a variety of heavy construction and excavation projects throughout the Eastern section of North America and overseas, including dams, bridges, dock and port facilities, shafts and tunnels.

Lavino Shipping Names R.E. Delaney Director

The appointment of **Robert E. Delaney** as a member of the board of directors of Lavino Shipping Co. has been announced by **Edward J. Lavino II,** president of the Philadelphia, Pa.-based firm. Mr. **Delaney** is treasurer and controller of Lavino Shipping.

Giardino To Chair Rudder Club Dinner

Thomas J. Giardino

The appointment of **Thomas J. Giardino,** traffic manager of the Marchessini Steamship Lines, as general chairman for the "Ninth Annual International Maritime Night Dinner" of The Rudder Club, Inc., Brooklyn, N.Y., was announced by commodore **Clifford M. Palmer,** vice president of Lee & Palmer. Also appointed as dais chairman for the affair was **Daniel J. Altilio,** traffic manager for Central Gulf Lines.

The dinner, which is being held Wednesday evening, March 14, 1973, will be in the Grand Ballroom of the Hotel St. George, Brooklyn.

The Rudder Club, which is known for its educational grants for many years, aggregating over $100,000, is one of the largest maritime organizations in the country and has chosen that evening, as in the past, to honor the top executives representing American, as well as foreign steamship lines, serving the ports of New York and New Jersey.

The cost per guest is set at $17.50 each (includes gratuity), and checks should be made payable to Rudder Club, Inc., 518-26 Columbia Street, Brooklyn, N.Y. 11231.

Entertainment chairman for the evening will be **Berndt M. Palmer,** president of Lee & Palmer.

Santa Fe Opens Tehran Headquarters— New Managers Named

Santa Fe Drilling Co., Orange, Calif., has reorganized its foreign management with the opening of a new regional headquarters in Tehran and the naming of new managers for London, Southeast Asia and the Middle East.

E.L. Shannon Jr., president of the parent Santa Fe International Corp., said the establishment of the Middle East headquarters reflects the growing importance of the company's operations in that area. In recent years, Middle East operations had been managed out of Eastern Hemisphere headquarters in London.

Eight Santa Fe rigs are presently operating in the Middle East region, according to **Gordon M. Anderson,** president of Santa Fe Drilling Co. The region includes Iran, Saudi Arabia, Abu Dhabi and Kuwait. In addition, he said, the company has contracted nine new units to start drilling there this year.

Clyde Dawson, Santa Fe Drilling Co. vice president, has transferred to Tehran as regional general manager, Middle East. He had previously been assigned to Nigeria as managing director of Santa Fe Nigeria Development Co., Ltd.

Other key personnel assigned to Iran include **Donald J. Zimmer** as zone manager and **C.M. (Buck) Sheldon** as administration manager, Middle East. **B.G. Parker,** continues as regional operations manager.

Senior vice president **Charles R. Ball Jr.,** regional manager in Southeast Asia since 1971, has assumed the position in London as regional general manager in charge of the company's operations throughout Europe and Africa.

Sam Carnahan, former area manager in charge of African operations, has been promoted to assistant regional general manager in London.

Vice president **Lawrence M. Jones,** who has been in charge of Santa Fe's drilling operations in North and South America, has been given additional responsibilities as regional general manager, Western Hemisphere and Southeast Asia. He continues to work out of company headquarters in Orange, Calif.

E.E. Leard has been promoted from zone manager in Nigeria to operations manager, Southeast Asia, with headquarters in Djakarta.

ASNE Los Angeles Section Hosts Joint Meeting With SNAME And MTS Los Angeles

Shown at the joint meeting, left to right: Capt. **Richard C. Fay,** chairman of the Long Beach-Greater Los Angeles Section of ASNE; **Frank J. Nickels,** Section chairman of the Los Angeles Metropolitan Section of SNAME; **Chris Neilsen,** speaker; **William B. Merselis,** chairman of the Los Angeles Chapter of MTS, and **Philip Finkelstein,** papers chairman of the Long Beach-Greater Los Angeles Chapter of ASNE.

On January 11, 1973, the Long Beach-Greater Los Angeles Section of The Society of Naval Engineers hosted a joint meeting with the Los Angeles Metropolitan Section of The Society of Naval Architects and Marine Engineers and the Los Angeles Chapter of the Marine Technology Society.

The speaker, **Chris Neilsen,** who is a design engineer at the Long Beach Naval Shipyard, presented a very comprehensive paper on "Variable Pitch Propeller Systems." The paper was very well received by 110 representatives of the three societies.

Included among the guests were Rear Adm. **Raymond W. Burk,** USN, Deputy Commander of the Naval Ship Systems Command for Field Activities, representatives from the fleet operating forces and the U.S. Coast Guard.

Combustion Engineering Elects R.A. Amen Corporate Vice Pres.

The board of directors of Combustion Engineering, Inc., Windsor, Conn., has elected **Robert A. Amen** to the newly created post of corporate vice president, marketing and communications.

In his new post, Mr. **Amen** will be responsible to the chief executive for corporate-wide market research, marketing planning, corporate policies and procedures to "coordinate total marketing and communications efforts," and all marketing communications.

"C-E has tripled its sales of steam generating, petroleum production processing and other energy equipment during the last decade, and annual sales are now in excess of $1.1 billion," **Arthur J. Santry Jr.,** president, said. It has become apparent that C-E needs "a more comprehensive and better coordinated approach to marketing" if it is to "compete favorably and remain a leader in our primary markets," Mr. **Santry** said.

Mr. **Amen** was formerly staff vice president, communications, for C-E, a post he held since joining the company in 1969. Prior to that, he had been a vice president with D.F. King & Co., Inc., a Wall Street consulting firm, and was a marketing communications executive with General Time Corporation and U.S. Industries, Inc.

A graduate of City University, Mr. **Amen** also took graduate studies at Columbia University. He is a member of the New York Athletic Club and the Westchester Country Club.

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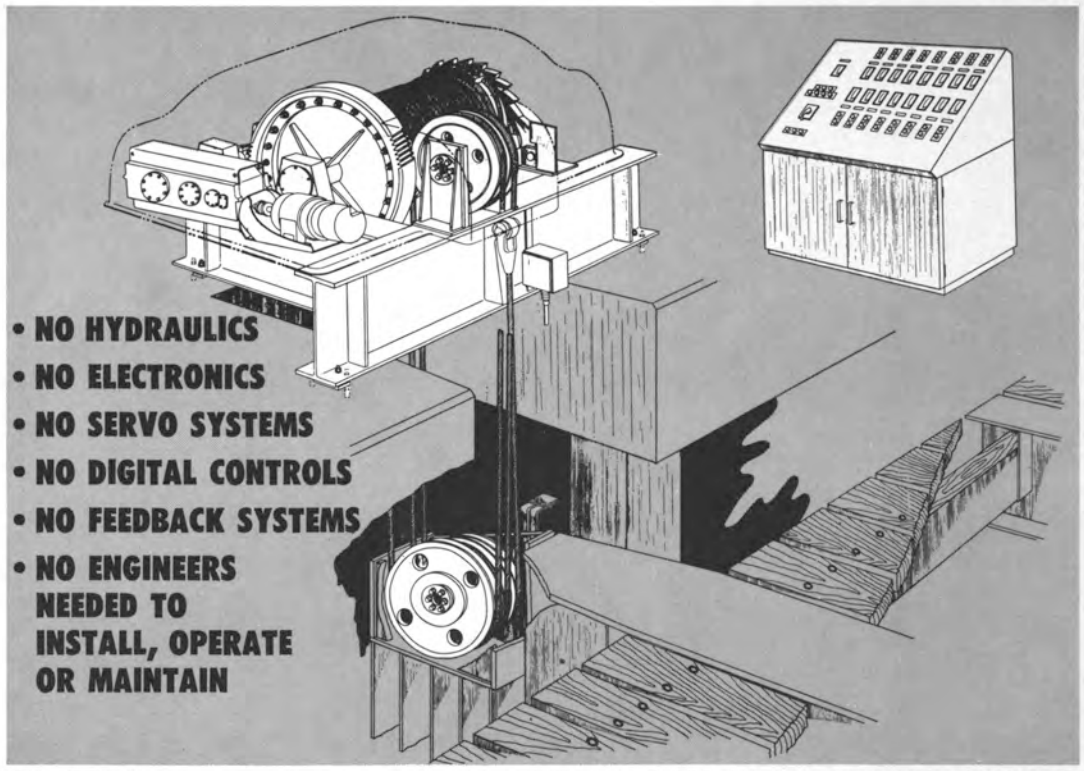

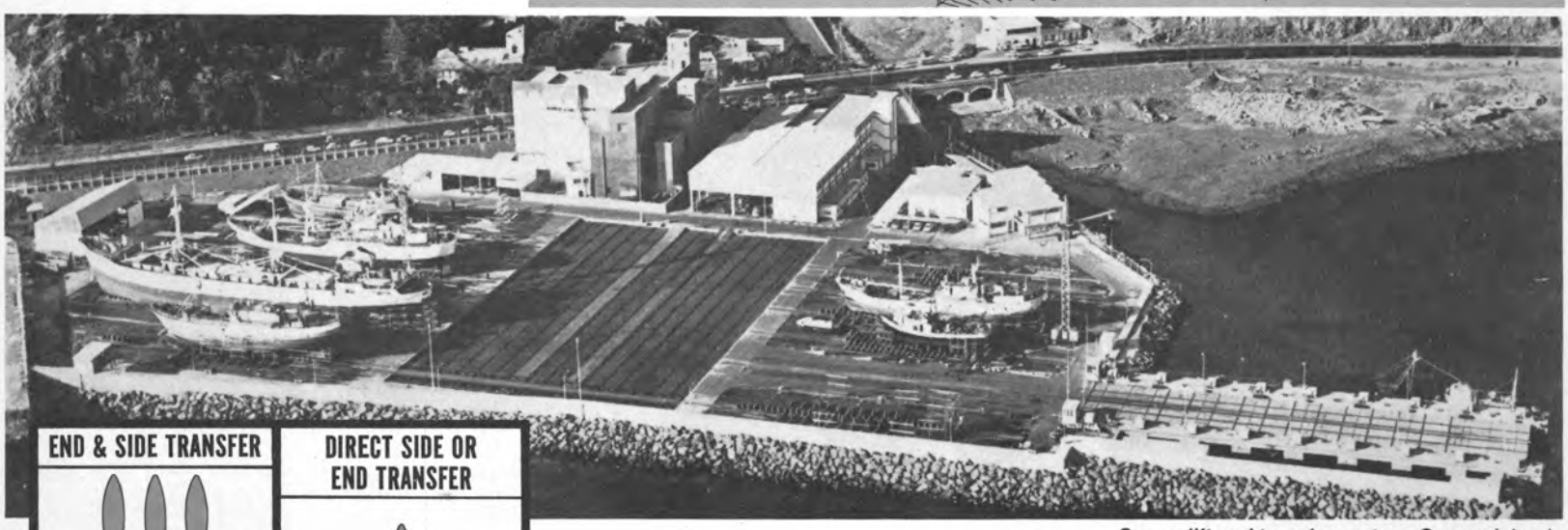

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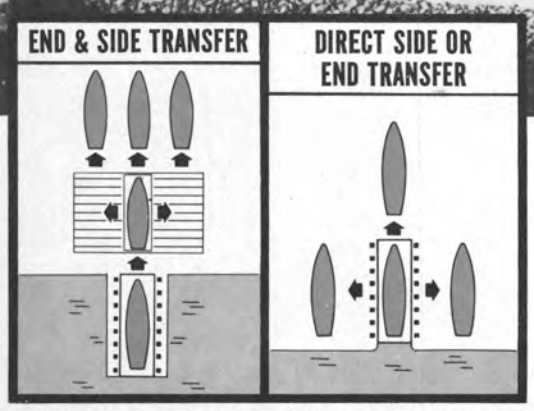

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Gen'l Dynamics Plans Third Graving Dock For Groton Shipyard

The Electric Boat Division of General Dynamics has announced plans to build a third graving dock at its Groton (Conn.) shipyard.

The new graving dock, plus associated construction facilities, represent a part of the company's continuing modification and improvement of its waterfront facilities to accommodate the anticipated volume of future submarine construction and overhaul business. The new graving dock is to be built between the present north yard building ways and the outfitting piers.

The two existing graving docks, which were built in the 1960s, are used primarily for conversion of missile submarines and overhaul and repair work.

To build the new facility, it will be necessary to excavate about 50,000 cubic yards of organic silt and fine sand, 11,000 cubic yards of sand and gravel, and 86,000 cubic yards of bedrock. The silt and sand will be used as landfill in an existing and approved site. The rock will be reserved for future construction and will be placed along the waterfront at the south end of the Electric Boat Division property.

The impact of construction methods on the environment has been studied in detail by the company and consulting engineers, and results indicate that the construction will have no significant or lasting effect on the existing ecosystem of the Thames River.

Joel Michael Brown Named Treasurer United States Lines

Joel Michael Brown

Edward J. Heine Jr., president of United States Lines, Inc., has announced the appointment of **Joel Michael Brown** as treasurer of the containership company.

Mr. **Brown** joined United States Lines as a financial analyst in 1969 and was elevated to assistant treasurer in 1971. In his new post, he will report to **Curtis B. Schwartz,** vice president and chief financial officer of the company.

Previously, Mr. **Brown** was associated with The Federal Reserve Bank of New York. He is a graduate of City College of New York and is completing work for a master's degree in business administration at the College's Baruch Graduate School.

United States Lines operates a tri-continent fully containerized freight service between Europe, the United States, Hawaii, Guam and the Far East.

PFEL Announces Two Appointments

Pacific Far East Line, San Francisco, Calif., has announced the promotion of Capt. **Carl R. James** to the position of operating manager.

Mr. **James** was formerly marine superintendent - passenger vessels for PFEL, and his new responsibilities will include all phases of terminal and vessel operations for both passenger and cargo divisions of the company.

Wallace V. Shrimplin, formerly assistant marine superintendent-passenger vessels, was named to succeed Captain **James** as marine superintendent-passenger vessels.

Two Appointments At Container Freight Corp.

Savery L. Nash, president of Container Freight Corp., Long Beach, Calif., has announced the election of **Raymond M. Veltman** as a director, and the appointment of **Marvin A. Mace, Jr.** as vice president of marketing. Mr. **Veltman** was the former owner of Overland Terminal Warehouse Co., which was recently acquired by Container Freight. Mr. **Mace** was in marketing and sales with International Business Machines for 12 years.

Change To Metric System Easier For Shipbuilders

Pictured from left: **F.W. Bryan,** president ASNE Flagship Section, who chaired the meeting; **Charles Zeien,** author and speaker, and **A. Dudley Haff,** Bethlehem Sparrows Point, who conducted the introduction and comments.

The transition to the metric system will be easier for shipbuilders than for most industries, **Charles Zeien,** executive vice president of J.J. Henry Co., Inc., told a recent meeting of the American Society of Naval Engineers in College Park, Md.

The change from the English to the metric system of measurement is inevitable, but not imminent, the executive of the firm of naval architects and marine engineers said in his paper "Metrication of U.S. Shipping," presented at the ASNE meeting at the Interstate Inn.

Mr. **Zeien's** report is based on Great Britain's experience, particularly that of the shipbuilding industry, toward metrication. Britain took 13 years to adopt the metric system and to develop a 10-year transition plan, he noted.

"It is recognized that shipbuilding has it easier than most businesses, since each shipyard can decide when it is 'ready' to start a new ship design predominantly in metric. Portions of the design can stay in English . . . and the shipyards can accept components built in either system with only a small amount of inconvenience," Mr. **Zeien** said.

Transition to the metric system . . . legal in the United States since 1897 . . . began with the scientific community after World War II. Metric ships have been repaired in U.S. yards for over a decade; the J.J. Henry Co. designed metric tankers for construction in Taiwan in the early '60s. "It is our current policy to offer ship design and working plans following either system, at the same price," Mr. **Zeien** stated.

"The transition phase of one industry has to be planned so that it is related to the transition of each interdependent industry. Shipbuilders cannot begin to use metric pipe until it is available from the pipe mills, and at the same time, the yards will want to work off their stocks of English pipe. The pipe mills are reluctant to change to the metric system until it is required by the shipbuilders," he explained.

Metrication is inevitable because: it is clearly better than the English system; it is necessary if the U.S. is to export capital equipment and engineering products to countries that use the metric system and whose standards are based on that system; and because of the advancement of the "One World" concept advocated by **Wendell Wilkie** in 1940, Mr. **Zeien** said.

Metrication is not imminent because: U.S. citizens know little about metrication, and care less; businessmen generally see the transition as a "cost," not as a benefit; and about half of the 5 percent of our GNP that is exported is farm products and jet airplanes, where the metric system has little impact, he added.

"Recent reports from Great Britain indicate that they overestimated their cost of transition sevenfold, while underestimating the problems," Mr. **Zeien** said.

Education is one of the obvious, first priority problems to be faced, he noted, adding that careful and realistic planning is needed to minimize cost and disruption and to achieve the desired objectives.

"Conversion cost will be about equal to the cost of well-run safety programs . . . .1 to .25 of one percent of sales," Mr. **Zeien** said.

As for the Federal Government subsidizing some of the cost of transition, he declared: "It is my hope that Government aid, if there is any, will be limited to specific areas of gross inequity . . . I feel this transition will provide areas of opportunity, whole new growth industries, so-called 'darlings of Wall Street.'

"Conversion to metric is a step this country should have taken in 1917. Each year it gets harder.

"Unfortunately, conversion to metric is not imminent, but let's start advocating it now. As we press ahead, do not believe the cost estimates you will be hearing; they will be overstated. Do not believe the problem estimates either; they will be optimistic. But do let's get on with it."

General Dynamics-Quincy Gets $40-Million Addition To U.S. Navy Contract

A $40-million addition to a Navy contract for design work on the Trident missile-firing submarines has been received by General Dynamics Corp., Quincy Division. A request of $1.2 billion for work on the Trident submarine is contained in the new fiscal 1974 budget, with an additional $536.7 million requested for work on the Trident missile.

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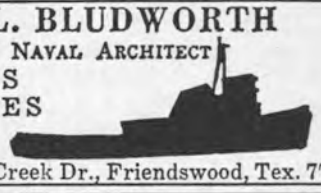
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Noise Control On Diesel Tugs Subject Of Meeting Held By SNAME Pacific NW Section

The Pacific Northwest Section of The Society of Naval Architects and Marine Engineers met at The Wharf, Fisherman's Terminal, in Seattle, Wash., on January 11, 1973.

During the technical session, following cocktails and dinner, the members and guests heard a paper on "Noise Control on Diesel Tugs." Diesel powered tugboats tend to be noisy. Not only are diesel engines inherently noisy, but tugs pack a great deal of power into a relatively small hull. Furthermore, the trend is toward more power and higher speed, and therefore, noisier engines. The problem is even more acute since the awareness of the harmful features of noise has increased. The Government (Walsh Healy Act) is specifying maximum noise levels, and crews are objecting to excessively noisy conditions. Owners, builders, and naval architects are becoming aware of the problem and are looking for solutions.

The paper "Noise Control on Diesel Tugs," jointly presented by **Thomas R. Dyer** of Marco, Seattle, and **Bertel Lundgaard** of Diehl and Lundgaard, Bainbridge Island, contributes substantially toward the goal of quieter tugboats.

The basic sound measuring unit is, of course, the decibel. Two terms requiring definition are sound absorption, and noise barriers. Noise barriers are used to prevent noise from traveling from the noisy to the quiet space. The effectiveness of a noise barrier is a function of its mass.

On the other hand, absorptive materials are soft in order to allow the sound to pass through them rather than being deflected. Absorptive materials are therefore ineffective sound stoppers.

The authors define one more term—frequency. High frequency attenuation is much easier to achieve than low frequency attenuation. This is fortunate since high frequency noise is the most annoying as well as being the most severe threat to health.

Taking part in the meeting, left to right: **Thomas R. Dyer** of Marco, Seattle, and **Bertel Lundgaard** of Diehl and Lundgaard, Bainbridge Island, co-authors, and **George D. Salisbury,** chairman of the Pacific Northwest Section.

The construction at Marine Construction and Design Co. of two sister tugs, the Edith Lovejoy and the Anne Carlander (Puget Sound Freight Lines) afforded the authors a unique opportunity to compare two differing noise control specifications on two otherwise identical vessels.

Fabreeca and rubber were used to isolate the main engine and certain other equipment from the hull proper. Various types of insulation, including Cafco Heat-Shield and an acoustic insulation consisting of two layers of foam separated by a lead septum, were used in the engine room, as well as in the crew spaces.

The audience was shocked upright when Mr. **Lundgaard** and Mr. **Dyer,** equipped with a noise measuring device and an ancient foghorn, originally carried by either the Foss No. 9 or the Virginia V, demonstrated and identified various noise levels.

Discussors were **Paul Graebke** of Puget Sound Freight Lines; **Robert Allan** of Robert Allan Ltd., Vancouver, British Columbia; **S.R. Windsor; Robert Kienholtz;** and **Howard Lovejoy** of Puget Sound Freight Lines.

Arnold Landesberg Leaves Luria Brothers To Open Own Office

After 23 years as head of the Machinery and Equipment Division of Luria Brothers/Lipsett, Philadelphia, and nine previous years as superintendent of equipment for I-T-E Circuit Breaker Company, also of Philadelphia, **Arnold Landesberg** has opened his own office at 104 North Ormond Avenue, Havertown, Pa. 19083, a suburb of Philadelphia, to act as a machinery and equipment consultant for industry.

During his years with Luria Brothers/Lipsett, Mr. **Landesberg** handled the purchase and sale of salvage materials, Government and industrial surplus, as well as marketing salvable items generated in shipbreaking activities.

During this period of his activities with Luria, he handled two of the largest equipment liquidations in the United States—the East Lehigh Ordnance Plant (26,000 tons of machinery sold), and the South Charleston Naval Ordnance Plant, containing 18,000 tons of heavy equipment and cranes.

Mr. **Landesberg** graduated from the Wharton School of Commerce, University of Pennsylvania, where he later became a guest lecturer at the Wharton Graduate School for three years, two years of which were specialized in material handling.

The American Society of Tool and Manufacturing Engineers gave him a special citation for wartime innovative efforts in the field of manufacturing.

Pourable Chocks Save 11,488 Man-Hours In USS Proteus Overhaul

The use of pourable chocks instead of conventional metal chocks saved 11,488 man-hours during the installation of 12 new diesel generator sets on the USS Proteus, the Navy's first nuclear submarine tender.

The results of the Proteus overhaul were cited in a recent demonstration of the Chockfast pourable chocking system by the Value Engineering Department of the Mare Island Navy Shipyard. The demonstration was arranged for shipyard personnel who were only familiar with the more costly metal chocks.

The department pointed out that metal chocks were specified on the original installation drawings. In line with Naval Ship Systems Command Notice 4121, directing the use of equipment or systems that perform the required function at the lowest possible cost, representatives of Mare Island and Charlestown Naval Shipyards agreed that the Chockfast pourable chocking system, developed by Philadelphia Resins Corp., should be used in the Proteus overhaul.

A cost analysis of the overhaul showed a saving of 11,488 hours, valued by the Navy at $164,000, by eliminating the machining of foundations, base plates, and chocks. These results are cited by the Value Engineering Department at Mare Island as proof of their determination to achieve significant savings in ship overhauls consistent with superior performance.

United States Lines Reestablishes Office In Washington, D.C.

United States Lines has reestablished a company office in Washington, D.C., it was announced by **Edward J. Heine Jr.**, president of the containership company. The office, located at 1620 I Street, N.W., Suite 617, Washington, D.C. 20006, will be managed by **J. Daniel Smith,** special assistant to Mr. **Heine.**

Mr. **Smith** joined United States Lines in 1950 in New York. Since then, he has served in managerial positions in the company's passenger and freight sales departments in Chicago, Ill., St. Louis, Mo., Baltimore, Md., and Washington, D.C.

Mr. **Smith** served with the United States Navy in the Pacific Theater of Operations during World War II and holds a bachelor of science degree in business administration from the University of Denver.

Maritime Association Port Of N.Y. Names Executive Director

N. Nick Cretan

The appointment of **N. Nick Cretan** as executive director of The Maritime Association of the Port of New York, effective March 1, was announced by **John D. Kerr,** president.

Prior to this new appointment, Mr. **Cretan** was deputy executive director of the Marine Exchange of the San Francisco Bay Region. He joined that organization in July 1964, and has played an active and innovative role in its service and promotional efforts.

Mr. **Kerr** said Mr. **Cretan** succeeds the late **William F. Giesen,** who retired March 31, 1972. Noting that The Maritime Association will mark its 100th anniversary this year, Mr. **Kerr** said the association had engaged in an extensive search for a full-time salaried officer, "and we are confident that we have him in Mr. **Cretan.**"

After graduating from college, Mr. **Cretan** taught briefly at the Columbia, Calif., Elementary School, then joined the National Federation of Independent Business at San Mateo, where he dealt with various Government agencies in behalf of small business. He later became an associate of a film producing and marketing firm, A.T. Palmer Studios, San Francisco, and also served as a regional sales representative for the H.J. Heinz Co.

He is a member of the Commonwealth Club of California, Society of Port Engineers, the Mariners Club of California, and The Propeller Club of the United States, and is active in civic and educational circles. He lives in Concord, Calif., and plans to relocate in the New York area after assuming his duties in New York City.

Mooremack Appoints Paul J. Evanson Assistant Vice Pres.

The appointment of **Paul J. Evanson** as assistant vice president of Moore and McCormack Co., Inc., parent firm of Moore-McCormack Lines, has been announced by **Paul R. Tregurtha,** the company's vice president of finance.

Mr. **Evanson** formerly served with Arthur Andersen & Co., and in his new post will be directly responsible for all tax activities of the parent company and the shipping line, its main subsidiary.

Howmet Announces New All-Aluminum Scaffold Boards

An all-aluminum heavy-duty scaffold board, TUF-ALUM by Southern Extrusions Division of Howmet Corporation, designed to meet new safety standards required in industry, is now available.

TUF-ALUM scaffold boards are available in 6, 7, 8, and 10-foot lengths; three boards completely cover a standard deck. The Southern Extrusions boards are suitable for applications ranging from rolling maintenance towers to heavy-duty masonry. Other lengths and widths are available.

Exceeding the OSHA load rating requirements, TUF-ALUM scaffold boards provide more than 75 pounds-per-square-foot load rating, U/L listed. Other safety features include nonflammable all-metal construction, safety latch connections, no-lap end connectors, and "ship ladder" tread surface.

Heavy gage heat-treated structural aluminum alloy used in the boards lasts indefinitely, saving time in maintenance and replacements.

Complete information can be obtained by contacting **Charles Taylor,** Fabricated Products Manager, Howmet Corporation, Southern Extrusions Division, P.O. Box 40, Magnolia, Ark. 71753.

Technical Paper On "Segregated Ballast VLCCs —An Economic And Pollution Abatement Analysis" Discussed At SNAME Chesapeake Section Meeting

Shown at the SNAME Chesapeake Section January meeting, left to right: Dr. **Karl Schoenherr,** honorary member, retired; **Seth Hawkins,** Naval Ship Research and Development Center, Section vice chairman; Lt. Comdr. **Joseph Porricelli,** USCG, author; **Peter M. Kimon,** ESSO International Division, EXXON Corp., author; **Ronald Kiss,** Maritime Administration, author; **Hollinshead de Luce,** Bethlehem Steel Corp.; **Phillip Eisenberg,** national president of SNAME; **John J. Nachtsheim,** MarAd; and **E. Scott Dillon,** MarAd, moderator.

The Chesapeake Section of The Society of Naval Architects and Marine Engineers held the fourth meeting of its 1972-73 technical program on January 11, 1973, at the Naval Medical Center Officers Club in Bethesda, Md.

Following the social hour and dinner, which were enjoyed by approximately 150 members and guests, vice chairman **Seth Hawkins** opened the meeting by welcoming those in attendance and congratulating **William Hunley,** chairman, membership committee, for his role in recruiting 139 new members and 59 upgradings in membership during the past year.

Vice chairman **Hawkins** also introduced the national president of SNAME, **Phillip Eisenberg,** who was in attendance.

After completing other normal Section business, vice chairman **Hawkins** introduced the moderator of the technical session, **E. Scott Dillon,** Assistant Administrator for Operations, Maritime Administration. Because of the turmoil surrounding both the need to import oil during the energy crisis and the Government's pollution abatement program, Mr. **Dillon** introduced this paper as a "painfully timely paper." He introduced the authors as representatives of a Government/industry team established to study one phase of this problem. The authors are: **Peter M. Kimon,** head, research tanker department, ESSO International Division, EXXON Corp.; **Ronald K. Kiss,** Chief, Division of Ship Design, MarAd, and Lt. Comdr. **Joseph Porricelli,** MMT, USCG, and the title of their technical paper was "Segregated Ballast VLCCs—An Economic and Pollution Abatement Analysis."

The technical discussion of the paper was presented in two parts, one by Commander **Porricelli,** and the other by Mr. **Kiss.** The paper presented the results of a study of very large crude carriers (VLCCs) to determine the cost and effectiveness of variations in the capacity of segregated ballast in these tankers and several variations in tank arrangements to reduce oil pollution due to operational and accidental causes. The tank arrangements considered were double bottoms, double sides, double skins and alternating cargo and ballast wing tanks. The paper concentrated on a series of 250,000-dwt tankers, but did also consider the influence of ship size by including results for tankers of 120,000 dwt and 477,000 dwt.

The degree of effectiveness for each tank arrangement was estimated for both operational and accidental pollution based on the best available data. Sensitivity studies were provided to verify the general conclusions of the report. Finally, estimates of the cost to prevent one cubic meter of oil pollution were presented for each of the various design arrangements.

Written discussions were presented by Lt. Comdr. **Virgil Keith,** USCG; Captain **Dickson** (read by Captain **Van Lier**), Shell Oil Co.; **M. de Leon,** J.J. McMullen Assoc.; **Lee Parke Adair,** J.J. Henry Co., and **R. Granville Parker,** Bethlehem Steel. The authors' closure and answers to both the written and verbal discussions were presented by Mr. **Kimon.**

The obvious interest of the membership and the discussions generated by this paper indicated that the final solution has yet to be determined and will be the subject of future analysis and debate.

Roland Verret Joins Scully Brothers Boat

Roland Verret, formerly with the Central of Georgia Railroad, Macon, Ga., has been named general office manager of Scully Brothers Boat Builders, Inc., Morgan City, La., **Raymond Scully Jr.,** president, reports. A graduate of Iowa Institute of Telegraphy, Marshalltown, Iowa, Mr. **Verret** was with Petroleum Helicopters in Morgan City before joining Scully Brothers, where he will be in charge of personnel, payroll, accounting and purchasing.

Scully Brothers reports that it currently has contracts for eight shrimp boats, two towboats for Big T Marine Towing and Sales, and one towboat for Wisconsin Barge Line. The Big T boats measure 75 feet by 30 feet by 10 feet, and 58 feet by 22 feet by 8 feet. The larger boat will be equipped with two Brons diesel engines supplied by Oosterhuis Industries, Inc. The small vessel will have a stilted pilothouse.

The Wisconsin Barge Line vessel measures 65 feet by 24 feet by 8.6 feet, and will be delivered in early spring. Also, an offshore supply vessel was recently built and launched for Joe Galloway of Morgan City. Named the Star Buck, this vessel measures 100 feet by 26 feet by 10.5 feet.

Scully Brothers is currently expanding its facilities for prefabrication of pilothouses and storage of steel. A new warehouse with a stockroom and two offices for foremen is also under construction, and the main office has been relocated and enlarged to accommodate increased production expected in 1973.

Seaspan International Ltd. Begins New Oil Barge Service

The Seaspan 822, shown above, is designed to be towed either off the nose or using West Coast bridles and is rigged for either mode of towing.

Seaspan International Ltd. has recently commenced a new tanker-barge service with a newly constructed 25,500-barrel-capacity vessel.

Designed by Cove Hatfield and Company and built by Vancouver Shipyards Co. Ltd., the Seaspan 822 has dimensions of 240 feet by 54 feet by 16.6 feet and a mean draft of 12 feet 6 inches in the loaded condition. It contains 18 separate tanks with four pumping systems that can be used in tandem. In addition, it is equipped with a crane and storage areas for handling drum and packaged cargo. Antipollution controls are included in the barge equipment.

Following the trend of the more recent Seaspan barges, the vessel is not fitted with hull guards but has a heavy 5/8-inch side shell with suitable internal stiffening. The boarding ladders are recessed to give an overall sleek exterior appearance.

This addition to Seaspan's fleet will enable the company to fulfill a recently signed contract with Standard Oil Company of B.C. Ltd. covering transportation services on the British Columbia coast.

Furness Withy Announces Two Managerial Appointments

Frank S. Pittarese has been appointed manager-sales of Furness Withy Agencies (U.S.A.). The company also announced that **James A. Moe** has been named manager of the organization's Baltimore, Md., office, succeeding the late **C.L. Deems.** Prior to joining Furness, Mr. **Moe** was manager of operations and chartering for Great Lakes Overseas, Inc., Chicago, Ill.

SNAME EASTERN CANADIAN SECTION MEETS: In following with the adopted policy of the Eastern Canadian Section of The Society of Naval Architects and Marine Engineers to hold a number of meetings outside of the Montreal area, the January 25 meeting was convened in Ottawa. **Sidney Mathews,** area vice chairman, presided. The guest speaker, Lt. Comdr. **R.C. Smith** of the Canadian Armed Forces, presented a paper titled "Developing a Canadian Undersea Capability," outlining the economic technological relationship which would be likely to occur in an undersea exploratory program. Following the paper, a lively discussion from the floor ensued, indicating a very high degree of interest by the members and guests in the topic discussed in the paper. Pictured at the meeting, left to right, are: **R.C. Truax,** chairman of the Eastern Canadian Section, Commander **Smith,** author, and Mr. **Mathews,** vice chairman, Ottawa Area.

Rudolph Matzer Designs First Of A New Class Of Oceanographic Vessels

A new all-steel research vessel is the first of a new class of oceanographic ships to be built and equipped from the keel up for her mission of deepsea research.

Built in sections from 345 tons of ABS-inspected steel plate supplied by Republic Steel Corporation, the new vessel boasts a number of firsts. It is the first new research ship to be completed under a program to replace the old, outmoded ships which currently constitute nearly half the academic oceanographic fleet. It is one of the first to discard the conventional chine hull "mudboat" concept used in research vessels in favor of a sleek molded hull designed specifically for oceanographic research. It is the first to make extensive use of open decks, and the first to be completed under the aegis of the National Science Foundation.

The new $1.4-million vessel is named for the late physical oceanographer **Columbus Iselin,** who twice served as director of Woods Hole Oceanographic Institution, and was well-known for his contribution to understanding the circulation of the North Atlantic Ocean. The ship will be operated by the University of Miami's Rosentiel School of Marine And Atmospheric Science in cooperation with the University National Oceanographic Laboratory System (UNOLS).

The vessel was designed by Rudolph F. Matzer and Associates, naval architects and engineers and built by Bellinger Shipyards, Inc., both of Jacksonville, Fla. According to **Rudolph Matzer,** who heads the design firm, "The Iselin's molded hull makes the ship more seaworthy and maneuverable, and it can be driven faster with less horsepower."

The $1.4-million R/V Columbus Iselin, shown at dockside in the Bellinger Shipyards, Jacksonville, Fla. Forty-foot-long steel plates, supplied by Republic Steel's Gadsden, Ala., mill, were used for its construction and in the making of the molded hull.

Principal dimensions of the new vessel are 170-foot overall length, 36-foot beam, and 15-foot molded depth. Forty-foot-long steel plates ⅜-inch thick were used for its construction and in the making of the molded hull. Designed for a cruising speed of 14.5 knots, the Iselin is propelled by twin Caterpillar D-398A diesel main engines connected to variable-pitch propellers.

The ship is able to remain at sea for 35 days without reprovisioning. It carries a crew of 12 and a scientific staff of 13.

Tank capacity is provided for 60,000 gallons of fuel and 8,500 gallons of fresh water, supplemented by twin Maxim HJ-20 salt evaporator units. Electrical power is supplied from twin GM Detroit Diesel 150-kw generator sets. The vessel is completely air-conditioned. Laboratory space of 1,075 square feet adjoins an open main deck aft, which provides a 2,000-square-foot platform for scientific operations at sea. Two hydraulic cranes, two hydraulic A-Frames and stern ramp are located on the main deck to facilitate handling of scientific equipment. A main trawl winch and two hydrographic winches are located on the upper deck and operate in conjunction with the two A-Frames. An aft control tower located on the starboard side, overlooking the main deck, enables the vessel and any of its winches to be operated from a central vantage point when in a working mode.

Electronic equipment includes twin radar units, single side-band, AM, VHF radio, precision echosounders, depth sounder, Sperry Gyro system, Omega Navigation system, RDF and loran.

The Iselin will be equipped for a wide range of oceanographic operations, including trawling for biological specimens coring for deepsea sediments, dredging for rocks, echosounding, seismic refraction measurements, and sampling the physical and chemical parameters of the ocean.

In air-conditioned laboratories, researchers will be able to carry out preliminary analyses of collected samples and specimens while at sea. A conference room will also be provided for scientific personnel aboard.

New Paceco Container Cranes First For Hong Kong Island

Paceco 40-long-ton Transtainer at the Port of Norfolk, Va., similar to the two Transtainers to be installed at the North Point Wharves.

The first specialized container handling cranes to be installed on Hong Kong Island will be going into operation in June of 1973 for the North Point Wharves Limited Container Terminal.

Designed for handling containers in the terminal, the cranes are mobile with huge rubber tires. They will have a 40-long-ton capacity and telescoping lifting spreaders for handling both 20-foot and 40-foot containers. Designed and built by Paceco, a division of Fruehauf Corporation, Alameda, Calif., the cranes known by the registered name of "Transtainer" have a 74-foot span, which enables them to straddle six rows of containers, plus a truck roadway.

Other container terminals in the Port of Hong Kong are on the mainland. The recent growth of containerization in the port is evidenced by the container handling equipment in these terminals. This year at the Kwai Chung site, there will be five Paceco Portainers (ship unloading cranes) and four Transtainers. At the Kowloon Wharf & Godown Company Terminal, there is one Paceco Portainer and three Transtainers. At the Hongkong & Whampoa Dock Co. Ltd., there is one Portainer and two Transtainers. The total handling facilities for the Port of Hong Kong this year will include seven Paceco Portainers and a total of 11 Paceco Transtainers. Six of the seven Portainers and 10 of the 11 Transtainers at the port have been ordered or put into service within the past two years.

Bethlehem Singapore Yard Delivers Teledyne Rig 16

Teledyne Rig 16, a self-elevating mat-supported mobile drilling platform, constructed by Bethlehem Singapore Private Ltd., was christened at the Singapore yard on January 21.

The first of two Bethlehem-designed rigs ordered from the yard by Teledyne Movible Offshore Inc. of Lafayette, La., it will be used for oil exploration in the waters of Southeast Asia.

Mrs. James H. Brazier, wife of the Teledyne drilling manager, christened the rig while it was afloat in the new Bethsing yard.

The rig will operate in water depths up to 250 feet, and can drill to depths of almost five miles.

The platform is the first of its type to be built at the new facility. Teledyne Rig 17, a sister rig, is expected to be delivered later this year. Another drilling platform is also under construction at the yard. The Teledyne 16 is the third rig to be delivered by the yard since its start.

A joint venture of Bethlehem Steel Corporation and the Development Bank of Singapore, the new yard is on a 79-acre tract on former British naval base property.

The yard specializes in the design and construction of mobile offshore drilling platforms and associated equipment.

Glacier-Herbert Sterngear System Described To New York Port Engineers

An advanced system which permits sterngear inspection and repair without drydocking was described to The Society of Marine Port Engineers in New York. On January 17, 1973, at the Downtown Athletic Club, New York City, British inventor and consulting engineer **Colin W. Herbert,** under the sponsorship of **Lee H. Clark** of Texaco International, spoke to the Society.

The leading benefits of the Glacier-Herbert sterngear system, as developed by The Glacier Metal Company of Alperton, London, in conjunction with Mr. **Herbert,** are the savings in time and cost made possible by eliminating drydocking, both at surveys and in the event of repair work.

Shown above at the January 17 meeting, left to right: (front row) **Lee H. Clark,** sponsor; **Colin W. Herbert,** speaker, and **Joseph Thelgie,** chairman and toastmaster; (back row) **Louis Minett,** chairman, papers and technical committee; **Edward English,** chairman, program and entertainment committee; **Walter L. Vaughan,** president, E.L. Post & Co., Inc.; **H.H. Hunt,** secretary-treasurer, and **John C. Fox Jr.,** past president.

In addition, the Glacier-Herbert system provides improved sternbearing lubrication and cooling, compared with conventional sterngear, and allows for bearing alignment to be adjusted with the ship afloat and in any condition of loading. The system is compatible with all forms of propeller and mounting. During construction, the system can be installed with minimal machining in situ and a consequent saving in time.

Mr. **Herbert's** paper gave a detailed analysis of economic considerations, as well as a critical appraisal of the background to modern thinking on sterngear design and the technical aspects of the Glacier-Herbert system.

At the January 17 election meeting, the following were elected to the respective offices:

President, **Philip A. Donahue;** 1st vice president, **Joseph Thelgie;** 2nd vice president, **William P. Towner.**

Board of directors—Representing Members for term of three years: **Harry J. Ottaway, Harlan T. Haller, William F. Muir,** and **Adrian P. Knox.**

Board of directors—Representing Members for term of two years: **George E. Murphy.**

Board of directors—Representing Associate Members for term of two years: **Edward English** and **Lee H. Clark**

Board of Directors—Representing Associate Members for term of one year: **Frank J. Dunlap.**

SUB KEEL INITIALED: Mrs. Victoria E. Hruska, wife of Senator **Roman L. Hruska** of Nebraska, brushes initials which she welded on the keel of the attack submarine USS Omaha. The event took place January 27, and marked the start of construction of the Navy's high-speed sub at the General Dynamic's Shipyard, Groton, Conn. Watching are (left to right) her daughter, **Miss Jana Hruska;** Secretary of the Navy **John W. Warner; Hilliard W. Paige** and **David S. Lewis,** president and chairman, respectively, of General Dynamics; Senator **Hruska;** and Vice Adm. **H.G. Rickover,** director, Naval Nuclear Propulsion Program.

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Last, but not least, the opportunity to live and work on the Connecticut shore of Long Island Sound is in itself a real advantage. Modern or period homes, excellent schools, and the entire outdoors at your doorstep for recreation—skiing, skating, hunting, fishing, sailing—just minutes from your job.

Get a piece of the action for yourself. Write details of your background, or call Mr. R. H. Moore (203) 446-3040 for an appointment.

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Electric Boat Division

75 Eastern Point Road, Groton, Conn. 06340

U.S: Citizenship Required • Male & Female applicants Invited to Apply

An equal opportunity employer

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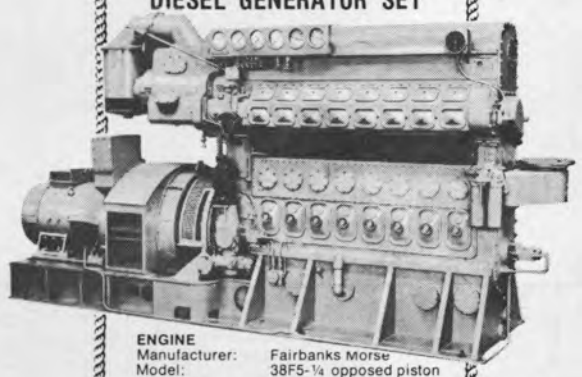
400 KW MARINE
DIESEL GENERATOR SET



ENGINE	
Manufacturer:	Fairbanks Morse
Model:	38F5-¼ opposed piston
RPM:	1200
Cylinders:	8
Rotation:	Left hand (CCW from drive end)
GENERATOR	
Manufacturer:	Westinghouse
Capacity:	(500 KVA) 400 KW
Voltage:	450 (3-phase, 60-cycle)
Amperes:	641
RPM:	1200
Exciter:	Direct mounted
Total Weight:	21,000 lbs.
Condition:	**UNUSED**

PECK EQUIPMENT COMPANY

3500 ELM AVENUE, PORTSMOUTH, VA. 23704

TELEX 82-3469 PHONE (703) 399-4071

SHIPWAY FOREMAN

A Southern California based shipyard is searching for a Hull Construction (Shipway) Foreman. The individual selected for this position will be in complete charge of erection and outfitting of all construction on the shipways. The job involves module erection and outfitting of all components on the ways.

STEEL FOREMAN

This same shipyard also requires a Steel Foreman with heavy experience in loft practices, preparation and sub-assembly module construction of major units. This will include responiibility for the fabrication of foundations, rudders, and all outfitting items.

These positions require a minimum of five years of top-flight shipyard experience with heavy responsibility and proven success.

Please send resume including salary history to:

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107 East 31 Street

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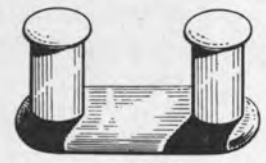
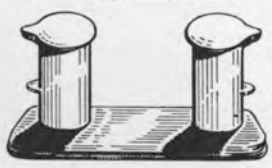
EXCELLENT STOCK

DOUBLE BITTS



STYLE A



STYLE B

Used, clean, good, suitable for re-use. Predominantly 12" and 14" sizes, 2 styles. Many other sizes in stock, ranging from 6" to 18".

Specify quantity, size and style required, for fast quotation.

Please Contact: Ralph Ingram

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Phone: 228-8691, Code 503 — Telex: 36-0503

SHIPS FOR SALE

6 CIMAVI TYPE VESSELS
for
NON-TRANSPORTATION USE

Dimensions: LOA 338' 8" — Beam 50' — Depth 29' — Draft 23' 5"
Tonnage: Gross 3805 — Net 2123 — DWT 6090 — Displ 8370
Main Propulsion: Single Screw, 1700 HP Diesel
Auxiliary Generators: 250 KW, 230V D.C. Diesel
Complete With All Accessories. Saw Very Little Service Before Government Layup. Extremely Good Condition.
Ideal as Self Propelled Drill Ship, Crane Ship, or as Stationary Supply or Quarter Ship.
6 Available — Gulf Location

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Built 1953
Clyde Model 24-E-80—10
Rated 40 Tons @ 32' to 50' Radius; 30 Tons @ 60'; 20 Tons @ 75'; 15 Tons @ 85'
Self Propelled, Gantry Mounted, Equipped with 40 HP Motor-generator Set for Magnet Operation
Track Gauge 50'6"
Portal Heighth 22'
Main Hoist—150 HP (3 Drum)
Boom Hoist—100 HP
Swinger Motor—30 HP
(4) Travel Motors 15 HP each
440 Volt, 60 Cycle, 3 Phase operation
525' of Track (2)—127# Rails with 3rd Rail Electric Conductor System
LOCATION: New York Harbor Area

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Rebuilt Guaranteed LaDel, STURTEVANT etc.

In 440 AC, in 115 DC, and in 230 DC, and i nsizes 1 HP through 20 HP. Completely reconditioned.

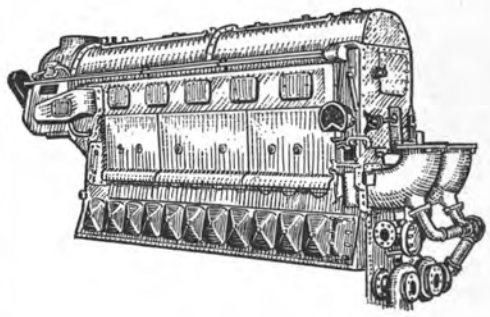
EXAMPLE LISTING:

Size A¼	Size A3	Size A8
Size A½	Size A4	Size A10
Size A1	Size A5	Size A12
Size A2	Size A6	Size A16

SPERRY GYRO COMPASSES

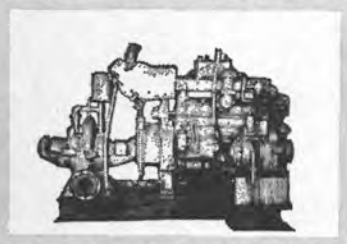
SPERRY MARK 14, Model 1 Gyro Compasses, used, good, complete with Master Compass, with Binnacle, Amplifier panel, control panel, carbon pile voltage regulator, motor generator set, alarm panel, and repeaters with mounts.

MARINE DIESEL ENGINES

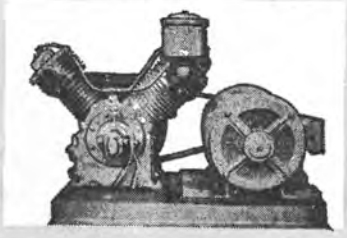


MATCHED PAIR . . . FAIRBANKS-MORSE Model 38D8-⅛—1 Port; 1 Starboard. Used condition, 1800 HP, 800 RPM, 2 cycle, 8½" bore, 10" stroke, Air Start. Complete with Westinghouse Reduction Gears, 2.216:1 ration—with Hydraulic Coupling.

FIRE PUMPS AIR COMPRESSORS



2—BUDA, Model 6-LD-468, Diesel Engines, 6 cylinders, 100 BHP, Marine, Gardner-Denver. centrifugal Pumps, Bronze, horizontally split case, 100 GPM, 280' head, 6" suction and 5" discharge.



2—GARDNER-DENVER, 150 CFM, 125 PSI, Class WB, Size 7x5¾x5, with Diehl Motors, 45 HP, 230 Volts DC, 870 RPM, 167 Amperes.

3—INGERSOLL-RAND, Size 5x5x4x 4, 50 CFM, 150 PSI, with G.E. Motor, 20 HP, 440/3/60.

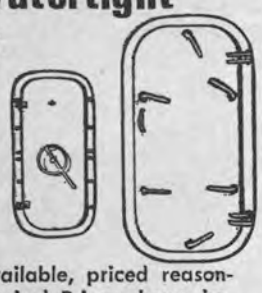
1—INGERSOLL-RAND, Size 4x1½x 3½, 10 CFM, 600 PSI, with Diehl Motor, 7½ HP, 120 Volts DC.

2—WESTINGHOUSE AIR BRAKE Steam, Size 11x11x12, approximately 60 CFM at 100 PSI.

1—INGERSOLL-RAND, Model 40B, 155 CFM, 110 PSI, 870 RPM, with 40 HP Motor, 230 DC.

1—WORTHINGTON, 20 CFH, 3000 PSI, 4 stage, 585 RPM, with Worthington Steam Turbine, 47 HP, 5502 RPM.

Steel Watertight DOORS



Used, Good Condition, Trimmed Frames.

Many sizes available, priced reasonable. Some Typical Prices shown below. Please Inquire for other sizes.

26"x48"-4 Dogs-**$60.00 ea.**
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26"x66"-6 Dogs, 8 Dogs-**$100.00 ea.**
26"x66"-Q.A. Type-**$175.00 ea.**

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5 ton rated, Steel, as removed from surplus ships. Manufactured by: Young, Draper, etc., 12" & 14" sizes.

$42.00 ea. $49.50 each with pull test certificates

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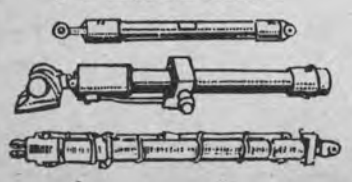
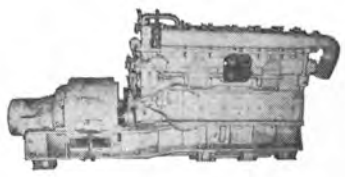
1—SPERRY No. 2, 5 HP, 230 Volts DC, complete with Steering Winch, Controller Panel, Ballast Resistor, Electro-Mechanical Steering Stand —with Steering Wheel (with Pull-out Knob).

HYDRAULIC CYLINDERS



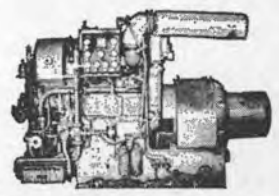
Bore	Overall Stroke	Rod Diameter	retracted length	Action
10"	12"	3.75"	45½"	double
10"	26"	3.75"	58½"	single
2"	8"	1½"	20"	double
2.5"	15"	1.12"	25½"	double
3"	8"	1.37"	15½"	double
6"	8'	4"	144"	double

MARINE DIESEL GENERATORS



4—COOPER-BESSEMER, Marine . . . Model FSN 6, 6 cylinders, 375 HP, 900 RPM with General Electric generators, 250 KW 440/3/60.

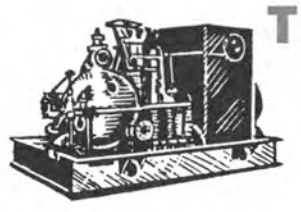
6—SUPERIOR Diesel Engines . . . Model GBD8 Marine, 150 HP, 1200 RPM, 8 cylinder, with Delco Generators, 100 KW, 120/240 DC.



4—GENERAL MOTORS, Model 3-268A, marine, 150 BHP, 1200 RPM, 3 cylinders, with 100 KW Generators, 450/3/60.

3—GENERAL MOTORS, Model 3-268 A, Marine, 150 HP, 1200 RPM, 3 cylinders, with Allis-Chalmers Generators, 100 KW, 120/240 DC.

TURBINE GENERATORS



4—GENERAL ELECTRIC, 525 PSI, with G.E. Generator, 250 KW, 440/3/60.

1—GENERAL ELECTRIC, with G.E. Generator, 350 KW, 440/3/60.

3—GENERAL ELECTRIC, Type ATB-2, 1250 KW, 440/3/60.

4—GENERAL ELECTRIC, Type FN3-FN20, 500 KW, 450/3/60.

3—WORTHINGTON, 225 PSI, 397°F, 6510 RPM, with Westinghouse Generator, 150 KW, 120 DC, 1250 Amperes.

6—WESTINGHOUSE, 200 PSI, with Westinghouse Generators, 60 KW, 120 DC.

4—ALLIS-CHALMERS, 440 PSI, 740°, with Allis-Chalmers Generators, 300 KW, 240/240 DC.

SUBMARINE DIESEL GENERATOR ENGINES

(Without Generators)

2—GENERAL MOTORS, Model 16-278A, 1600 HP, 750 RPM.

2—FAIRBANKS-MORSE, Model 38-D8-⅛, 16 cylinder, O.P., 1600 HP, 720 RPM.

STERN ANCHOR WINCHES

2—ALMON A. JOHNSON Stern Anchor Winches as removed from LST vessels, line pull rating 100,000 pounds at 10 FPM in low gear, complete with Contactor Panels, Resistors, and Master Switches.

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TURBINE: 420/618 PSI 825/850° Total Temperature Type FN4-FN30 11 Stage 8145 RPM GEI-19320

GEAR: Type S195A 8145/1200 RPM

GENERATOR: 1500 KW 450 V 3 Ph 60 Cy .8 PF 1200 RPM Continuous 2340 KVA 2 Hrs Type ATI-HL

Four Units Available, Complete with Board, Condensers, Air Ejector and Condenser and Condensate Pumps. Removed from CRUISER ROANOKE. In Like New Condition.

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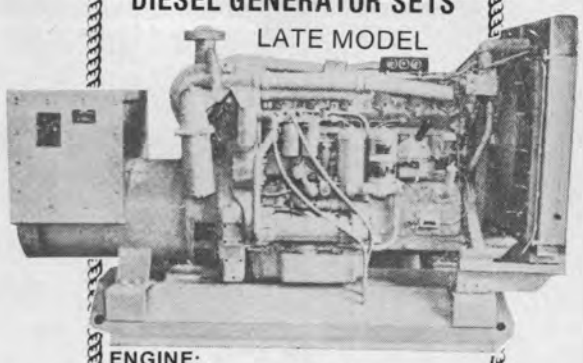
250 KW PORTABLE DIESEL GENERATOR SETS

LATE MODEL



ENGINE:
MFG: Caterpillar (1970)
MODEL: D 343
R.P.M.: 1800
CYLINDERS: 6

GENERATOR:
CAPACITY: (312KVA) 250KW
VOLTAGE: 120/208/230/460
3 Phase, 60 Cycles
AMPERES: 835/784/392
TOTAL WEIGHT: 9500 pounds (prox)
CONDITION: 4500 hours average operating time. Purchased new, well maintained, excellent running condition.

Automatic Safety Shutdown for:
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Used, overhauled, good condition

4-DeLaval horizontal Screw, 700 GPM, 150 PSI, 1180 RPM, with Continental Motors, 100 HP at 1190 RPM, 440/3/60, constant torque, continuous duty, Frame NF746F.

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(1) 1300 HP Steel Tug 95'x25'x12'2" ABS load line -	$120,000.00
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Pair 155 HP Lathrop Marine Engines	$ 1,500.00
(1) GM 471 Rebuilt Diesel	$ 1,400.00

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Drawing No. 801068
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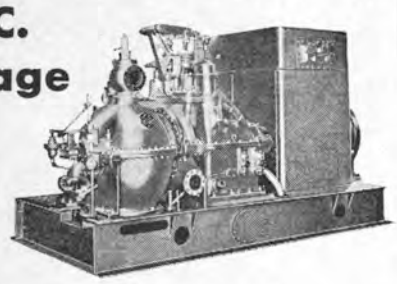
A.C. Voltage



4-1250 KW, General Electric. Turbines: Type FSN, 525 PSI, 7938 RPM. Generators: 1250 KW, 450/3/60, 3600 RPM, Type ABT2.

8-750 KW, General Electric. Turbines: Type FN3-FN24, 525 PSI, 10,033 RPM. Generators: 750 KW, 450/3/60, 1200 RPM, Type ATI.

4-500 KW, General Electric. Turbine: Type FN3-FN20, steam 375/425 PSI, 6 Stage, 9987 RPM. Generators: 500 KW, 450/3/60, 1200 RPM, Type ATI.

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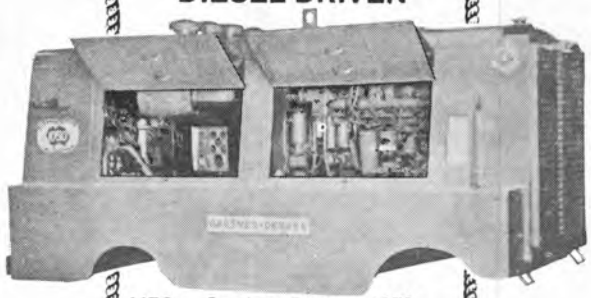
Phone: 228-8691, Code 503 — Telex: 36-0503

1200 CFM ROTA-SCREW
AIR COMPRESSOR
DIESEL DRIVEN



MFG: Gardner-Denver, 1970
MODEL: SP 1200, 2-Stage, Dry Type
OPERATING PRESSURE: 100 psi
R.P.M.: 1850
ENGINE: G.M. 12-V-71
MODEL: 7123-7000
SIZE: 15'4" LONG 6'4" WIDE 8'2" HIGH
WEIGHT (PROX): 15,700 pounds
The unit was designed for use with pneumatic tired wheels; which, along with the axles, are *not* available.

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Bronze—375 GPM @ 40' head—4" suction—3" discharge. Motor: 5 HP—115 volts DC—40 amps.

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Model G-160 — type 2M — serial 160A5 — diesel driven by GM 6-71 with TRA-76R 4-speed transmission type 2 MRAG—forward and reverse. LIPE 14-2 clutch. LINE PULL RATING: 30,000 lbs. on both drums simultaneously at a line speed of 60 FPM on the outer layer of cable and 25 FPM on the first wrap. DIMENSIONS: drum flange 60"—barrel 24"—barrel length 30". DRUM CAPACITY: 5000 ft. of 1" cable with 2" of free flange or 5938 ft. of 1" cable using full drum capacity. UNIT DIMENSIONS: OAL 188½" — OAW 123" — OAH 104"—foundation centers 63" Equipped with front and rear drum friction devices; front and rear drum brakes; 2 gypsys; pedestal foot brakes; ratchet & pawls; gear shifters; throttle control; clutch controls.

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UNUSED 30,000 CFM AXIAL FANS

Made by Joy Manufacturing Co.—A30A4W6. MOTOR: 25/14 HP—440/3/60—36-20.4 amps—1200/1900 RPM.

OTHER AVAILABLE AXIAL FLOW FANS

115 VOLTS DC
4000 CFM/5000 CFM/6000 CFM/10,000 CFM/12,000 CFM

230 VOLTS DC
Unused 2000 CFM 20AF—mfg. by Joy—0.75 HP motor—3450 RPM—3.4 amps—0.5" static—15" ID—17" flange

ALSO
8000 CFM/10,000 CFM/35,000 CFM

440 VOLTS AC
1000 CFM—Bufallo A1A4W5—¾ HP—440/3/60/3450
2000 CFM—220/440/3/60—1.5 HP/3400 RPM

THE BOSTON METALS COMPANY
313 E. Baltimore St. Baltimore, Md. 21202
539-1900 (301) 355-5050

FALK IN-LINE MARINE REVERSE REDUCTION GEAR

SUITABLE TO 1600 HP WITH MODIFICATIONS

700 HP @ 750/246 RPM—30" clutch drum—ratio 3.05:1—equal to new. Can be used with up to 1600 HP by modifying with larger clutch drums & tires.

30" CLUTCH DRUM TIRES
FOR FALK GEAR

700 to 1000 HP. Unused surplus. Type MO-165-099—built originally for use on F.S. vessels and DPC tugs.

$475 each

THE BOSTON METALS COMPANY
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NEW WATERTIGHT DOORS

6-Dog right and left hand hinged steel doors—with frames. Built and tested to A.B.S. specifications.

SIZE	NET WT.	PRICE
26"x48"	250 lbs.	$225.00
26"x60"	300 lbs.	$269.50
26"x66"	320 lbs.	$297.50
30"x60"	330 lbs.	$345.00

EACH DOOR

IMMEDIATE DELIVERY

THE BOSTON METALS COMPANY
313 E. Baltimore St. Baltimore, Md. 21202
539-1900 (301) 355-5050

BUYERS DIRECTORY

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Carrier Air Conditioning Co., Carrier Parkway, Syracuse, N.Y. 13201

BEARINGS
BJ Marine Bearings, a Borg-Warner Industry, P.O. Box 2709, Terminal Annex, Los Angeles, Calif. 90054
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

BOILERS
Babcock & Wilcox Co., 161 E. 42nd Street, New York, N.Y. 10017
Combustion Engineering, Inc., Windsor, Connecticut 06095

BOW THRUSTERS
Bird Johnson Co., 883 Main St., Walpole, Mass. 02081
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171

BUNKERING SERVICE
Gulf Oil Trading Co., 1290 Ave. of the Americas, N.Y., N.Y. 10019
Independent Petroleum Supply Co., 1345 Ave. of Americas, New York, N.Y. 10019
The West Indies Oil Co., Ltd., St. John's Antigua, W. I.

CARGO HANDLING EQUIPMENT
MacGregor International Organization, 49 Gray's Inn Road, London W.C.I., England

CATHODIC PROTECTION
Engelhard Industries, 430 Mountain Ave., Murray Hill, N.J. 07974

CLUTCHES, GEARS & BRAKES
Amarillo Gear Co., 517 No. Polk St., Amarillo, Texas 79105
Wichita Clutch Co., Inc., Wichita Falls, Texas 76307

COATINGS—Protective
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144
Devoe & Raynolds Co., Inc., Subsidiary Celanese Coatings Co., 414 Wilson Ave., Newark, N.J. 07105
EGD Spee-Flo Co., 4631 Winfield Rd., Houston, Texas 77039
Marine Engineering & Construction Co., Inc., 1664 Tchoupitoulas St., New Orleans, La. 70130
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.

CONTAINERS—CONTAINER HANDLING SYSTEMS
Ameron Corrosion Control Div., Brea, Calif. 92621
Lighter Aboard Ship, Inc., 225 Baronne St., New Oreans, La. 70112
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501
Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98421

CONTAINER LASHINGS & COMPONENTS
W. W. Patterson Co., 830 Brocket St., Pittsburgh, Pa. 15233

CONTROL SYSTEMS
Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

CORROSION CONTROL
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144

CRANES—HOISTS—DERRICKS—WHIRLEYS
ASEA Marine, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Conrad-Stork, Div. Stork-Werkspoor, P.O. Box 134, Haarlem, Holland
Hoffman Rigging & Crane Service, 560 Cortland Street, Belleville, N.J. 07109
Houston Systems Mfg. Co., P.O. Box 14551, Houston, Texas 77021
Kocks Pittsburgh Corp., Four Gateway Center, Pittsburgh, Pa. 15222
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501
Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98401

CRANE LOAD INDICATORS
Mark Products, Inc., 10507 Kinghurst Dr., Houston, Texas 77072
Trans-Sonics, Inc., P.O. Box 326, Lexington, Mass. 02173

DECK COVERS (METAL)
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027

DECK MACHINERY
Appleton Machine Co., P.O. Box 2265, Iron Mountain, Mich. 49801.
ASEA Marine, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202
Pacific Pipe Co., 49 Fremont St., San Francisco, Calif. 94080
Pine Tree Engineering, subsidiary of Rice Barton Corp., P.O. Box 654, Brunswick, Me. 04011.
A. G. Weser, Seebeckwerft, 2850 Bremerhaven 1, Germany

DIESEL ACCESSORIES
A.G. Schoonmaker, Box 757, Sausalito, Calif. 95965

DIESEL ENGINES
Alco Engine Div., White Industrial Power, Inc., 100 Orchard St., Auburn, N.Y. 13021
Bruce GM Diesel, Inc., 180 Route #17 S. at Interstate 80, Lodi, N.J. 07644
Caterpillar Tractor Co., Industrial Div., 100 N.E. Adams St., Peoria, Ill. 61602
Colt Industries Inc., Power Systems Div., Beloit, Wisc. 53511
De Laval Turbine Inc., Engine & Compressor Div., 550 85th Ave., Oakland, Calif. 94621
Electro-Motive Division General Motors, La Grange, Illinois 60525
George Engine Co., Inc., P.O. Box 8, Harvey, La. 70038
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany.
Sulzer Brothers, Ltd., Winterthur, Switzerland

DIESEL ENGINE MUFFLERS
Marine Products & Engrg. Co., 20 Vesey St., New York, N.Y. 10007

DOORS—Watertight—Bulkhead
Overbeke-Kain Co., 20905 Aurora Rd., Cleveland, Ohio 44146
Walz & Krenzer, Inc., 20 Vesey St., New York, N.Y. 10007

ELECTRICAL EQUIPMENT
Arnessen Electric Co., Inc., 335 Bond St., Brooklyn, N.Y.
Galbraith-Pilot Marine Corp., 600 4th Ave., Brooklyn, N.Y. 11215
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014

EVAPORATORS
Aqua-Chem, Inc., Water Technologies Div., Box 421, Milwaukee, Wis. 53201.
Bethlehem Steel Corp., Shipbuilding, 25 B'way, N.Y., N.Y. 10004
Riley-Beaird, Inc., Maxim Evaporator Profit Center, P.O. Box 1115, Shreveport, Louisiana 71130

FAIRLEADS
Appleton Machine Co., P.O. Box 2265, Iron Mountain, Mich. 49801.

FENDERING SYSTEMS—Dock & Vessel
BJ Marine Products, subsidiary of Borg-Warner, P.O. Box 2709, Terminal Annex, Los Angeles, Calif. 90054
Hughes Bros., Inc., 17 Battery Place, New York, N.Y. 10004

FITTINGS & HARDWARE
Robvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

FLOATING EQUIPMENT—Steel—Aluminum Pontoons
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.

HYDRAULICS
Bird Johnson Co., 883 Main St., Walpole, Mass. 02081
Universal Hydraulics, Div. of Ohio Brass Co., 4500 Beidler Road, Willoughby, Ohio 44094

INSULATION—Marine
Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

LIGHTS—Emergency, Search & Navigation
Elco Corp./Safecraft Div., Maryland Road & Computer Avenue, Willow Grove, Pa. 19090
Snelson Oilfield Lighting Co., 1201 E. Doggett St., Fort Worth, Texas 76104.

LNG TANKAGE
Gazocean U.S.A. Inc., 125 High St., Boston, Mass. 02110

LININGS
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144

MACHINERY MONITORS
Bently Nevada Corp., P.O. Box 157, Minden, Nevada 89423

MARINE BLOCKS & RIGGING
Crosby Group, Box 3128, Tulsa, Okla. 74101

MARINE DRIVES—GEARS
Hoffert-Lowe, Inc., 108 Ridge Road, North Arlington, N.J. 07032
Philadelphia Gear Corp., Schuylkill Expressway, King of Prussia, Pa. 19406
Western Gear Corp., Industrial Products Div., P.O. Box 126, Belmont, Calif. 94003

MARINE EQUIPMENT
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014
Kearfott Marine Products, 780 South 3rd Ave., Mt. Vernon, N.Y. 10550
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742
Peltz Brothers, Inc., 3499 Inventors Road, Norfolk, Va. 23502
Stow Mfg. Co., 225 Shear St., Binghamton, N.Y. 13902
Vokes Filter Div., (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

MARINE FURNITURE
Bailey Joiner Co., 115 King Street, Brooklyn, N.Y. 11231

MARINE INSURANCE
Adams & Porter, Cotton Exchange Bldg., Houston, Texas
Midland Insurance Co., One State St. Plaza, New York, N.Y. 10004
R.B. Jones Corp., 301 West 11th St., Kansas City, Mo. 64105

MARINE OIL BURNERS
John Zink Co., 4401 So. Peoria, Tulsa, Okla. 74105

MARINE PROPULSION
Babcock & Wilcox Co., 161 East 42nd Street, New York, N.Y. 10017
Combustion Engineering, Inc., Windsor, Connecticut 06095
Jacuzzi Bros., Inc., 11511 New Benton Highway, Little Rock, Ark. 72204
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171
Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Tech Systems, Inc., 405 Watertown Rd., Thomaston, Conn. 06787
Terry/Whiton, P.O. Box 350, New London, Conn. 06320
Turbo Power & Marine Systems, Subsidiary of United Aircraft Corp., 1690 New Britain Ave., Farmington, Conn. 06032

MARINE SURVEYORS
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Fla. 33316

MARITIME FINANCING
General Electric Credit Corp., 4 Corporate Drive, White Plains, N.Y. 10604

NAVAL ARCHITECTS AND MARINE ENGINEERS
J. L. Bludworth, 4030 Wynne St., Houston, Texas
Breit Engrg. Inc., 441 Gravier St., New Orleans, La. 70130
Childs Engineering Corp., Box 333, Medfield, Mass. 02052
Coast Engineering Co., 711 W. 21st St., Norfolk, Va. 23517
Crandall Dry Dock Engrs., Inc., 238 Main St., Cambridge, Mass. 02142
C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048
Arthur D. Darden, Inc., 1040 International Trade Mart, New Orleans, La. 70130
Sharp DeLong, 29 Broadway, New York, N.Y. 10006
Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119
Designers & Planners, Inc., 114 Fifth Ave., New York, N.Y. 10011
M. Mack Earle, 103 Mellor Ave., Baltimore, Md. 21228
Christopher J. Foster, 14 Vanderventer Ave., Port Washington, N.Y. 11050
Friede and Goldman, Inc., 225 Baronne St., New Orleans, La. 70112
Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110
Morris Gurainick, Associates, Inc., 583 Market St., San Francisco, Calif. 94105
J. J. Henry Co., Inc., 90 West St., New York, 10006
Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, Calif. 93017
Jantzen Engineering Co., 15 Charles Plaza, Baltimore, Md. 21201
James S. Krogen, 2500 S. Dixie Hwy., Miami, Fla. 33133
Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460
Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 1180 Ave. of Americas, N.Y., N.Y. 10036
Marine Design Associates, P.O. Box 2674, Palm Beach, Florida
Maritech, Inc., 38 Union Sq., Somerville, Mass. 02143
Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225
John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742
Robert Moore Corp., 350 Main St., Port Washington, N.Y. 11050
Nickum & Spaulding Associates, Inc., 71 Columbia St., Seattle, Wash. 98104
Ocean-Oil International Engrg. Corp., P.O. Box 6173, New Orleans, La. 70114
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156
S.L. Petchul, Inc., 8-D So. New River Drive East, Ft. Lauderdale, Fla. 33301
Sidney Merritt Polhemus, Ballouville Rd., RFD 2, Dayville, Conn. 06241
Potter & McArthur, Inc., 253 Northern Ave., Boston, Mass.
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 657 Mission St., San Francisco, Calif.
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007
T. W. Spaetgens, 156 West 8th Ave., Vancouver 10, Canada
R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wisc. 54235
Richard R. Taubler, 44 Court St., Brooklyn, N.Y. 11201
H. M. Tiedemann & Co., Inc., 74 Trinity Pl., New York, N.Y. 10006
Whitman, Requardt & Associates, 1304 St. Paul St., Baltimore, Md. 21202
Yankee Shipwrights, P.O. Box 35251, Minneapolis, Minn. 55435

NAVIGATION & COMMUNICATIONS EQUIPMENT
American Hydromath Co., 55 Brixton Rd., Garden City, N.Y. 11530
Collins Radio Co., M/S 407-321, Dallas, Texas 75207
ELCO Corp./Safecraft Division, Maryland Road & Computer Ave., Willow Grove, Pa. 19090
Electro-Nav, Inc., 501 Fifth Ave., New York, N.Y. 10017
F&M Systems Co., P.O. Box 20778, 2525 Walnut Hill Lane, Dallas, Texas 75220
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016
ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611
Lorain Electronics Corp., 2307 Leavitt Road, Lorain, Ohio 44052
Magnavox Navigation Systems, 2829 Maricopa St., Torrance, Cal. 90503
National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo.
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
Raytheon Co. Marine Products, 676 Island Pond Rd., Manchester, N.H. 03103
Raytheon Co., Submarine Signal Div., P.O. Box 360, Portsmouth, R.I. 02871
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.
Standard Communications Corp., 639 N. Marine Ave., Wilmington, Calif. 90744
Star Lifeline, Ltd., 1148 W. 15th St., No. Vancouver, B.C., Canada
Teledyne Hastings Raydist, P.O. Box 1275, Hampton, Va. 23361
Tracor, Inc., 6500 Tracor Lane, Austin, Texas 78721

OILS—Marine—Additives
ESSO International, Inc., 1251 Avenue of the Americas, N.Y. 10020
Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019
Mobil Oil Corp., 26 Broadway, New York, N.Y. 10004
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017

PAINT—Marine—Protective Coatings
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144
Devoe & Raynolds Co., Inc., Subsidiary Celanese Coatings Co., 414 Wilson Ave., Newark, N.J. 07105
Hempel's Marine Paints, Inc., 25 Broadway, New York, N.Y. 10004
International Paint Co., 21 West St., New York, N.Y. 10006
Marine Engineering & Construction Co., Inc., 1664 Tchoupitoulas St., New Orleans, La. 70130
Mobil Chemical Company, Metuchen, N.J. 08840
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.
Porter Paint Company, 400 South 13th Street, Louisville, Ky. 40203

PETROLEUM SUPPLIES
Independent Petroleum Supply Co., 1345 Ave. of Americas, New York, N.Y. 10019
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017
The West Indies Oil Co., Ltd., St. John's, Antigua, W. I.

PIPE—Cargo Oil
Kubota, Ltd., 22, Funade-cho 2-chome, Naniwa-Ku, Osaka, Japan
Tioga Pipe Supply Co., Inc., P.O. Box 5997, Philadelphia, Pa. 19137

PLASTICS—Marine Applications
Ameron Corrosion Control Div., Brea, Calif. 92621
Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231
Philadelphia Resins Co., 20 Commerce Dr., Montgomeryville, Pa. 18936

PORTS
Port of Galveston, P.O. Box 328, Galveston, Texas
Jacksonville Port Authority, 2701 Tallyrand Ave., Jacksonville, Fla.

PROPELLERS: NEW AND RECONDITIONED
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150
Bird-Johnson Co., 883 Main Street, Walpole, Mass. 02081
Coolidge Propellers, 1601 Fairview Ave. East, Seattle, Wash. 98102
Escher Wyss Gmbh, P.O. Box 798, Ravensburg, Germany
Federal Propellers, 1501 Buchanan Ave. S.W., Grand Rapids, Mich. 49502
Ferguson Propeller, 1132 Clinton St., Hoboken, N.J. 07030

PUMPS
Colt Industries, Inc., Fairbanks Morse Pump & Electric Div., 3601 Kansas Ave., Kansas City, Kansas 66110
Goulds Pumps, Seneca Falls, N.Y. 13148
Houttuin-Pompen N. V. Sophialaan 4, Utrecht, Holland
Jacuzzi Bros., Inc., 11511 New Benton Highway, Little Rock, Arkansas 72204
Worthington Corporation, Harrison, New Jersey 07029

RATCHETS
W. W. Patterson Co., 830 Brocket St., Pittsburgh, Pa. 15233

REFRIGERATION—Refrigerant Valves
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

ROPE—Manila—Nylon—Hawsers—Wire
American Mfg. Co., Inc., Noble & West Sts., Brooklyn, N.Y. 11222
Cating Rope Co., 309 Genesee St., Auburn, N.Y. 13022
Columbian Rope Co., 309 Genesee St., Auburn, N.Y. 13022
Du Pont Co., Room 31H1, Wilmington, Delaware 19898
Jackson Rope Corp., 9th & Oley, Reading, Pa. 19604
Wall Rope Works, Inc., Beverly, N. J. 08010

RUDDER ANGLE INDICATORS
Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215
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.

SANDBLASTING EQUIPMENT
Pauli & Griffin Co., 826 Folsom St., San Francisco, Calif. 94107

SCAFFOLD BOARDS
Howmet Corporaton, Southern Extrusions Division, P.O. Box 40, Magnolia, Arkansas 71753

SEWAGE DISPOSAL
Babcock & Wilcox Co., 161 East 42nd Street, New York, N.Y. 10017
Koehler-Dayton, Inc., P.O. Box 309, New Britain, Conn. 06050
LaMere Industries, Inc., 277 N. Main Street, Walworth, Wis. 53184

SHAFT REVOLUTION INDICATOR EQUIP.
Electric Tachometer Corp., 68th & Upland Sts., Phila., Pa. 19142
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913

SHIPBOARD VENTILATION
Coppus Engineering Corp., P.O. Box 457, Worcester, Mass. 01613

SHIPBREAKING—Salvage
The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202
Levin Metals Corp., P.O. Box 398, Point Station, Richmond, Cal. 94807
National Metal & Steel Corp., 1251 New Dock St., Terminal Island, Cal. 90731
Zidell Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201

SHIP BROKERS
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. 10006
Oaksmith Boat Sales, Inc., Fisherman's Terminal, Seattle, Wash. 98119

SHIPBUILDING STEEL
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., 25 Broadway, New York, N.Y. 10004
Huntington Alloy Products, Div. International Nickel Co., Inc., Huntington, W. Va. 25720
International Nickel Co., 1 New York Plaza, New York, N.Y. 10004

SHIPBUILDING—Repairs, Maintenance, Drydocking
Astilleros Espanoles, S.A. Zurbano, 70, Madrid 10, Spain
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150
Barbour Boat Works, Inc., P.O. Box 1069, New Bern, N.C.
Beliard, Crighton & Cie, P.O. Box 2074, Route des Docks, 59, Dunkirk, France
Beliard Murdoch S. A., Kattendijkdok Westkaai 21, Antwerp, Belgium
Bertram Marine, Division of Whittaker, 3663 N.W. 21 Street, Miami, Fla. 33142.
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Blount Marine Corp., P.O. Box 360, Warren, Rhode Island 02885
Bludworth Shipyard, Inc., Box 5426, Cypress St., Brady Island, Houston, Texas 77012
Brodogradiliste "SPLIT", P.O. Box 107, Split, Yugoslavia
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Curacao Drydock, Inc., P.O. Box 153, Willemstad, Curacao, N.A.
Dillingham Corp., P.O. Box 3288, Honolulu, Hawaii 96801
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.
Empressa Nacional Bazan, 65 Castellana, Madrid 1, Spain
Equipment Systems, Inc., A Microdot Co., P.O. Box 95, Port Deposit, Md. 21904
Equitable Equipment Co., Inc., P.O. Box 8001, New Orleans, La. 70122
General Dynamics, Electric Boat Division, 99M Eastern Point Road, Groton, Conn. 06340
General Dynamics, Quincy Division, Quincy, Mass. 02169
Gotaverken American Corp., 39 Broadway, New York, N.Y. 10006
Halter Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126
Havre de Grace, Havre de Grace, Md.
Hillman Barge & Construction Co., Grant Bldg., Pittsburgh 19, Pa.
Hongkong & Whampoa Dock Co. Ltd., Kowloon Docks, Hong Kong
Ishikawajima-Harima Heavy Industries Co., Ltd., 15 William St., New York, N.Y. 10005
Jacksonville Shipyards, 644 E. Bay St., Jacksonville, Fla. 32203
Jeffboat, Inc., Jeffersonville, Ind. 47130
Kawasaki Dockyard Co., 8 Kaigan-dori, Ikuta-ku, Kobe, Japan
Kelso Marine, Inc., P.O. Box 268, Galveston, Texas 77550
Kockums Malmo, Fack, Malmo, Sweden
Litton Industries, 9920 W. Jefferson Blvd., Culver City, Calif. 90230
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134
Marathon Manufacturing Company
Marathon LeTourneau Offshore Company, 1700 Marathon Building, 600 Jefferson, Houston, Texas 77002
Marathon LeTourneau Gulf Marine Division, P.O. Box 3189, Brownsville, Texas 78520
Marathon LeTourneau Marine Division, LeTourneau Rural Station, Vicksburg, Mississippi 39180
Marathon LeTourneau Offshore Pte., Ltd., P.O. Box 83, Taman Jurong Post Office, Singapore 22, Singapore
Marathon Shipbuilding Company, P.O. Box 870, Vicksburg, Miss. 39180
Marathon Shipbuilding Company (U.K.) Ltd., Clydebank Bunbartonshire, G81-1YB, Scotland
Marine Engineering & Construction Co., Inc., 1664 Tchoupitoulas St., New Orleans, La. 70130
Maryland Shipbuilding & Drydock, P.O. Box 537, Baltimore, Md. 21203
Matton Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047
Mitsui Shipbuilding & Engrg. Co. Ltd., 6-4, Tsukiji 5-chome, Chuo-ku, Tokyo, Japan
Mitsubishi Heavy Industries, Ltd., 5-1 Marunouchi 2-chome, Chiyoda-ku, Tokyo, Japan
Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655
National Steel & Shipbuilding Corp., San Diego, Calif. 92112
Newport News Shipbuilding and Dry Dock Co., Newport News, Va.
Newport Ship Yard, Inc., 379 Thames St., Newport, R.I. 02840.
Northwest Marine Iron Works., P.O. Box 3109, Swan Island, Portland, Oregon 97208
Nuclear Service & Construction Co., Inc., 9296 Warwick Blvd., Newport News, Va. 23607
O.A.R.N. (officine Allestimento e Riparazioni Navi) Genoa, Italy
Odense Steel Shipyard Ltd., P.O. Box 176, DK-5100 Odense, Denmark
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Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, Fla. 33156
Perth Amboy Dry Dock Co., Perth Amboy, N.J. 08862
Peterson Builders, Inc., 334 So. 1st Ave., Sturgeon Bay, Wis. 54235
St. Louis Shipbuilding—Federal Barge, Inc., 611 East Marceau, St. Louis, Mo. 63111
Sasebo Heavy Industries Co., Ltd., New Ohtemachi Bldg., Chiyoda-ku, Tokyo, Japan
Savannah Machine & Shipyard Co., P.O. Box 787, Savannah, Ga. 31402
Sembawang Shipyard (Pte) Ltd., P.O. Box 3, Sembawang, P.O. Singapore, 27
Star Shipyards, Ltd., 61 Duncan St., New Westminster, Vancouver, B.C., Canada
Sumitomo Shipbuilding & Machy. Co., Ltd. 2-1 Ohtemachi 2-chome, Chiyoda-ku, Tokyo, Japan
Swedish Shipbuilding Association, Fack S-402 70, Gothenburg 8, Sweden
Teledyne Sewart Seacraft, P.O. Box 108, Berwick, La. 70342
Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004
Tracor/Mas, Inc., P.O. Box 13107, Port Everglades, Fla. 33316

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Hydronautics, Incorporated, Laurel, Maryland 20810

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Weather Routing, Inc., 90 Broad Street, New York, N.Y. 10004

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Maritech, Inc., 38 Union Sq., Somerville, Mass. 02143
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Combustion Engineering, Inc., Windsor, Connecticut 06095

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SWITCHBOARDS
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TOWING—Salvage, Lighterage, Barge Chartering
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Bouchard Transportation Co., Inc., 25 West Barclay St., Hicksville, L.I., N.Y. 11801
Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202
Henry Gillen's Sons Lighterage, West End Ave., Oyster Bay, N.Y. 11771
James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004
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McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
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VALVES AND FITTINGS—Hydraulic—Safety Flanges
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Hubeva Marine Plastics-Lining, 435 Hamilton Ave., Brooklyn, N.Y. 11231
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027
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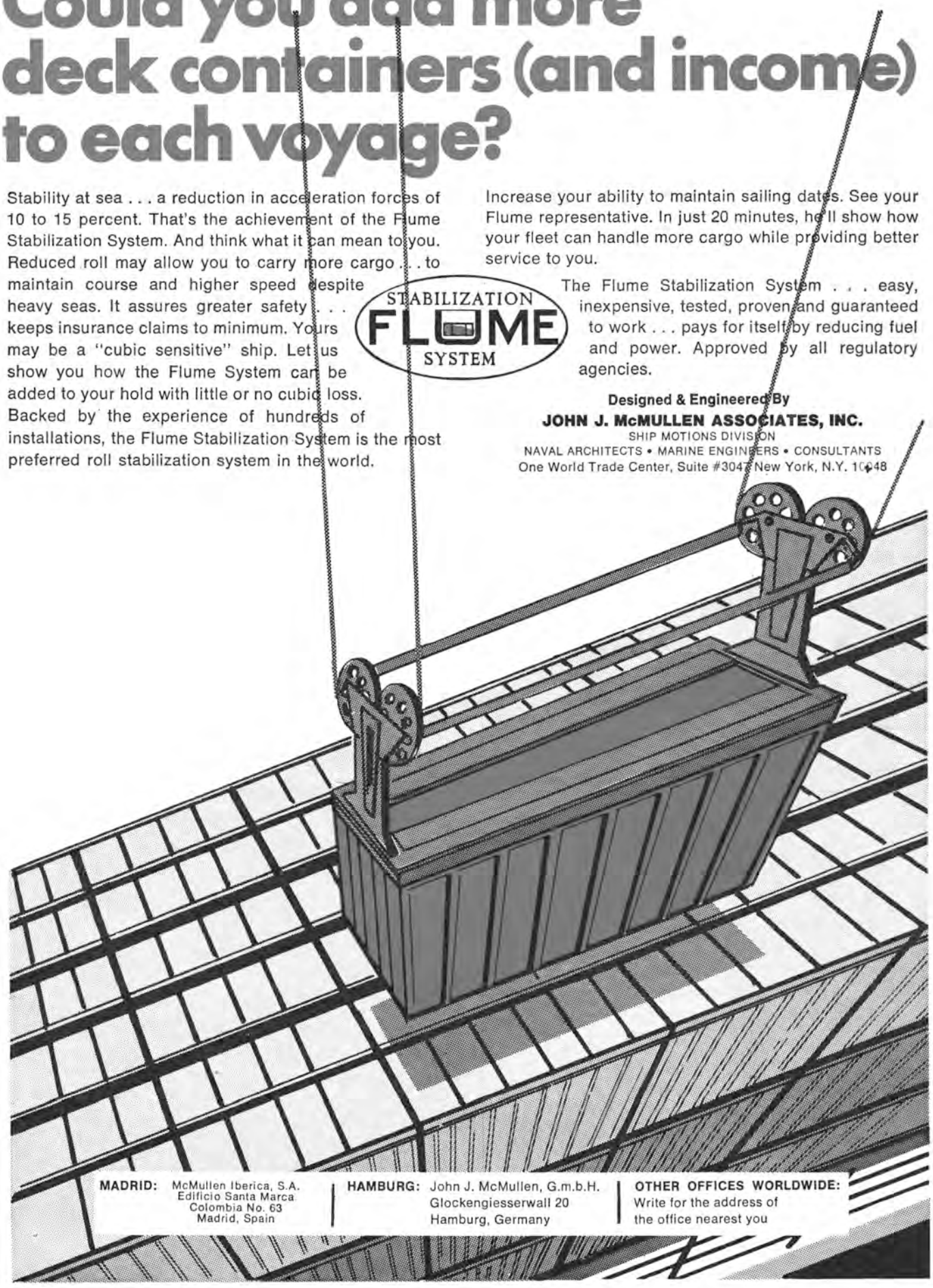

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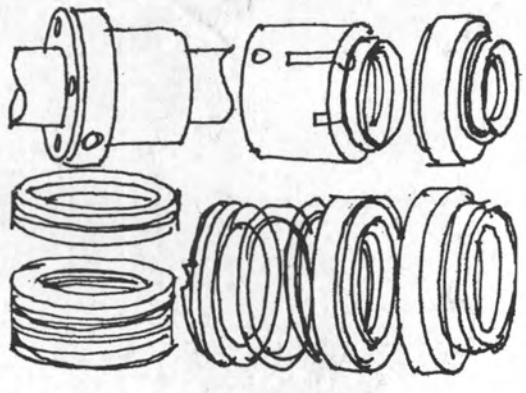

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