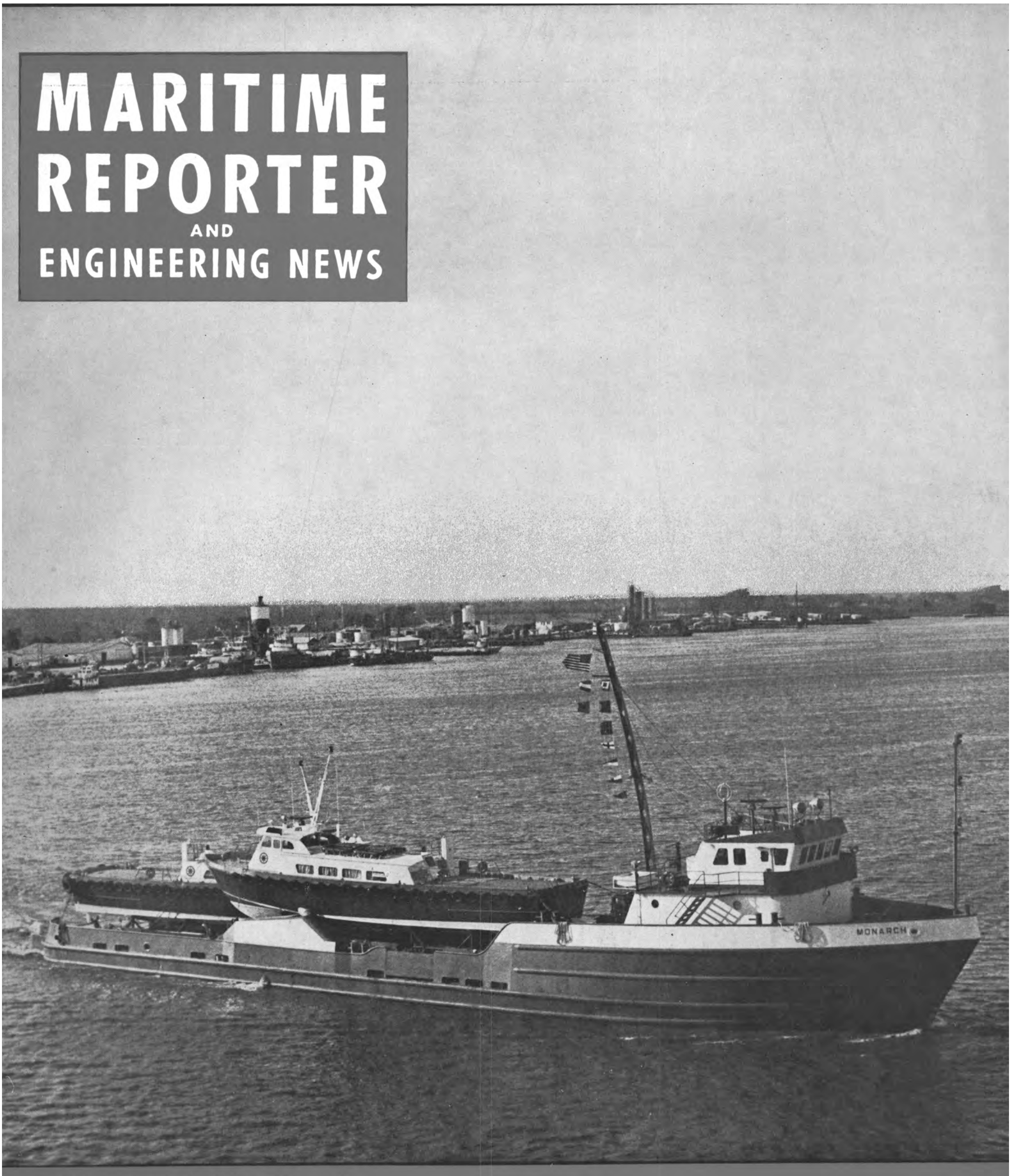
MARITIME
REPORTER
AND
ENGINEERING NEWS



Offshore Logistics' New Monarch Carries Two 80-Foot Crew Boats To Join Company Fleet In Singapore

(SEE PAGE 10)

MARCH 15, 1971

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APL Receives Extension From Subsidy Board

American President Lines request for an extension of its commitment to build one or two new passenger ships has been granted by the Maritime Subsidy Board. The approval extends the deadline to January 1, 1973.

The proposed new ships are to replace the President Cleveland and President Wilson whose economic lives have already been extended. In order to continue subsidized passenger operation APL will be required to construct one or two passenger ships under the agreement with the Maritime Subsidy Board.

Tidal Marine Int'l Acquires Four Tankers From Greek Shipowner

Tidal Marine International Corp. announced that it has agreed in principle to acquire four ocean-going tankers, aggregating nearly 100,000 deadweight tons, from a Greek shipowner.

The transaction involves $14 million in cash and stock. According to the announcement, the vessels, to be delivered in the spring of 1971, are all on long-term charters to major oil companies.

The company also advises that it has sold a 51,000-dwt tanker which was purchased in July.

Barge Construction

Atlantic Marine, Inc., Fort George Island, Fla. 32226, will build three 120-foot deck barges for the Corps of Engineers in the summer. The yard has expanded its shipbuilding operations to include construction of all-steel barges.

Gunderson, Inc., Portland, Ore., is building a 430-foot by 80-foot by 27-foot barge for Crowley Launch & Tugboat Co., San Francisco, Calif. The 160,000-barrel capacity vessel is slated for delivery in June.

Lemont Shipbuilding & Repair Co., Lemont, Ill. 60439, has been awarded a $178,160 contract by the Corps of Engineers, Philadelphia, Pa. 19106. The company will construct and deliver two all-welded, steel deck rock barges.

Twin City Shipyard, Inc., St. Paul, Minn., will build a 140-foot long by 50-foot wide heavy duty deck barge for Bultema Dock and Dredge Co., Muskegon, Mich. The vessel is scheduled for delivery in April.

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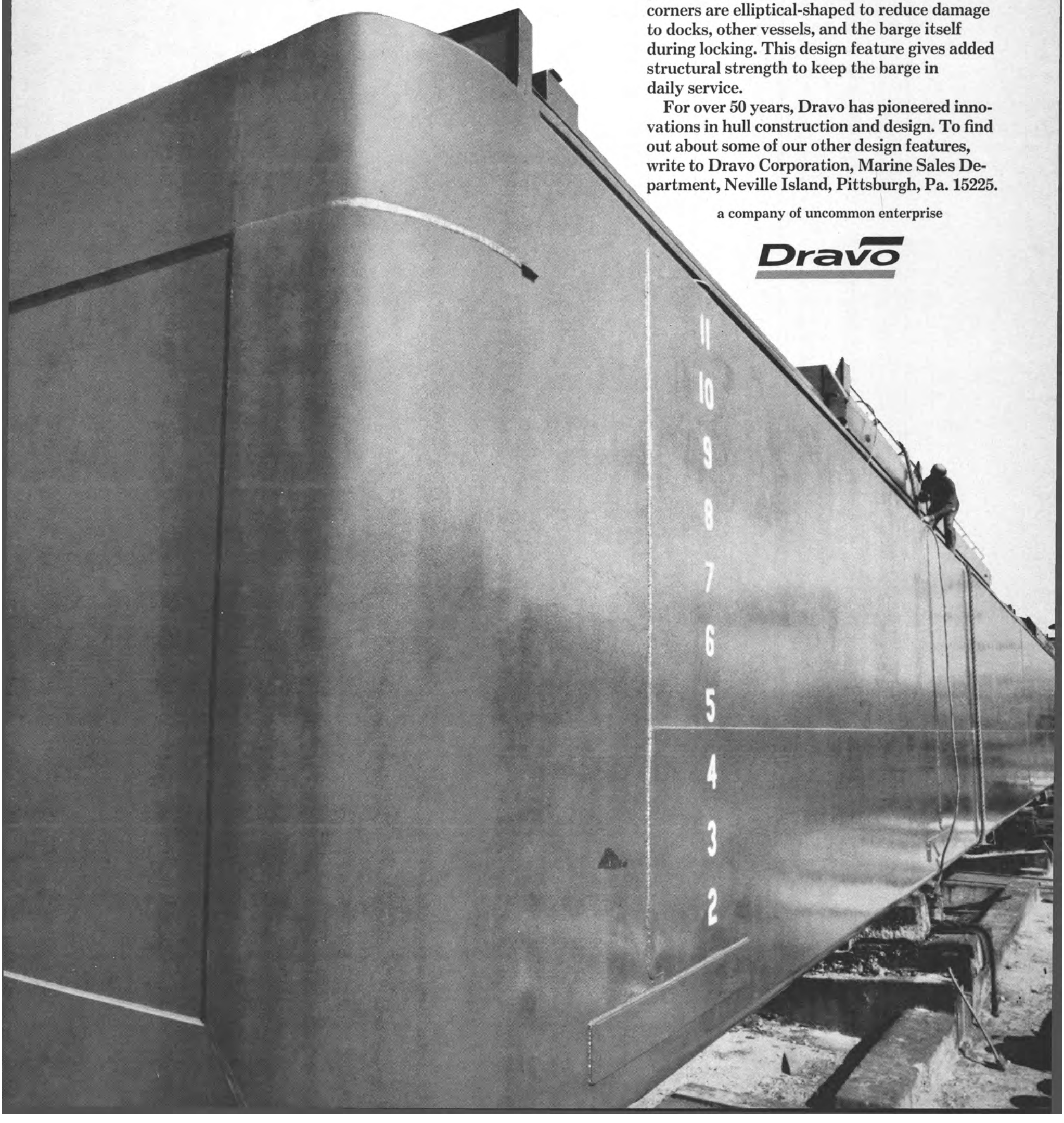

New England Ship Repair Yard Association Elects New Officers

George S. Hamilton, general manager of Bethlehem Steel Corporation's Boston yard, has been elected president of the New England Ship Repair Yard Association.

Douglas Brown, president of General Ship & Engine Works, was elected treasurer, and **Morton Bromfield,** vice president of Bromfield Corp., was elected secretary.

Formerly known as the Boston Ship Repair Yard Association, the organization is composed of ship repair yards which hold master ship repair contracts in the First Naval District.

The association's membership consists of Bethlehem Steel Corporation's Boston yard, East Boston, Mass.; Bromfield Corporation, East Boston, Mass.; Fairhaven Marine, Inc., Fairhaven, Mass.; General Ship & Engine Works, Inc., East Boston, Mass.; Holgate's Boat Shop, Inc., Wakefield, R.I.; Marine Contractors Company, Inc., East Boston, Mass.; Munro Drydock Inc., Chelsea, Mass.; Newport Ship Yard, Inc., Newport, R.I.; Norlantic Diesel, Inc., Fairhaven, Mass.; Norton's Ship Yard & Marina, East Greenwich, R.I.; P & M, Inc., Newport, R.I.; South Portland Shipyard & Marine and Railway Corp., Portland, Maine and Williams & Manchester Shipyard, Inc., Newport, R.I.

Admiral Will Reelected President Of AEIL —Remains As Chairman

Adm. John M. Will

Adm. **John M. Will,** USN (ret.), chairman of the board of American Export Isbrandtsen Lines Inc., has been reelected president of the company. Admiral **Will,** who will retain his office as chairman, replaces **Joseph Barkan,** who resigned.

A native of Perth Amboy, N.J., Admiral **Will** joined the American-flag company in July 1959, after retiring as Commander of the Military Sea Transportation Service. He served 40 years in the Navy.

Admiral **Will** was named the company's president and chairman initially, but resigned as president in 1965. He is also president and chairman of the company's wholly-owned First Atomic Ship Transport, which operated the nuclear ship Savannah.

The admiral is also president of the New York Shipping Association, which represents 126 steamship companies and waterfront employers in the Port of New York, and of the Whitehall Club.

The shipping company is a wholly-owned subsidiary of American Export Industries Inc., of which Admiral **Will** is a director.

Avondale Shipyards Apparent Low Bidder On Delta LASH Ships

The Maritime Administration opened bids on February 11, 1971 for the construction of one to six LASH (Lighter Aboard Ship) vessels for Delta Steamship Lines, Inc. The apparent low bidder was Avondale Shipyards, Inc., of New Orleans, La.

Avondale Shipyards' bid for one ship was $32,730,812, and the bid on each of six ships was $28,582,476. From the date of the contract, it is expected that the first ship would be delivered within 810 calendar days, and the balance of the contract would be completed within 1,260 calendar days.

It is expected that MarAd would make the award within 60 to 90 days. The contract has an option that allows until October 1 for a decision to be made as to whether the last three ships would be built.

W.G. Grennan Joins United Heat Exchanger

Walter G. Grennan

Walter G. Grennan, former chief design engineer for Mesco Tectonics Inc., has joined United Heat Exchanger Corp. as chief design engineer and operations manager. In his new capacity, he will be responsible for all engineering and design, together with coordination of all new construction and repairs to heat transfer equipment for the marine, chemical and petroleum industries.

Mr. **Grennan** has been involved in the design engineering, estimating and manufacturing of heat transfer equipment since his discharge from the Army in 1965.

United Heat Exchanger Corp. manufactures, repairs and rebuilds heat exchangers, condensers, evaporators, lube oil and water sample coolers. A new brochure on its line of heat transfer equipment is available by writing United Heat Exchanger Corporation, P.O. Box 657, Dept. M, Linden, N.J. 07036.

New WSA Committee To Concentrate On Navy Repair Work

G.H. Wintz, president of the Western Shipbuilding Association and vice president and general manager of Willamette Iron & Steel Co., Portland, Ore., has announced the formation of a special WSA Committee that will undertake as its first prime activity the development of a program, which hopefully will lead to an increase in naval ship repair and conversion work for private yards of the Pacific Coast.

The committee, titled "Ship Repair Committee," will seek through legislative and military channels, a better liaison between Government and the industry, and return of a reasonable percentage of naval ship repair and conversion work back to private yards.

Robert E. Mayer, Pacific Coast sales manager for Todd Shipyards Corporation, and **Thomas A. Rotell,** president of the Pacific Coast Metal Trades District Council, both of San Francisco, Calif., have consented to serve as co-chairmen of this highly important committee.

Mr. **Mayer,** recently elected chairman of the board by the association's directors, has resigned from that position so that he may concentrate fully on the important tasks that lie ahead for the new committee.

Arthur E. Farr, vice president of Northwest Marine Iron Works, Portland, Ore., has consented to continue as WSA chairman of the board, a position he held from 1966 to the latest WSA election on January 21, 1971. At that time, Mr. **Farr,** because of several other commitments, including his recent election as national president of The Propeller Club of the United States, resigned as WSA chairman of the board. However, in light of the importance of present WSA programs, he has agreed to resume the duties of chairman and will also serve as a member of the Ship Repair Committee.

Other WSA members, representing all sectors of the Pacific Coast, who have agreed to serve on this important committee are: **A.J. Maloney,** general manager, Bethlehem Steel Corp. Shipyard, San Pedro, Calif.; **James E. Daniels,** San Pedro regional director, Industrial Union of Marine and Shipbuilding workers of America; **Robert F. Bennett,** vice president, Campbell Machine, Inc., San Diego, Calif.; **E.J. Glenn,** administrative assistant to **G.W. Wintz,** Willamette Iron & Steel Co., Portland, Ore.; **Carl R. Meurk,** general manager, Todd Shipyards Corp., Seattle, Wash.; **Ferd Bondy,** president, Precise Products Co., Tacoma, Wash., and **Richard Kuwada,** president, Pacific Container Service, Inc., Honolulu, Hawaii.

Mariport '71 Exposition Offers A Separate Theme Each Day —Speakers, Topics Announced

A top line congress has been programmed and will be run in conjunction with the Mariport '71 exposition at The Baltimore Civic Center, April 5-8, 1971.

The congress will cover three morning sessions and one afternoon session, and will cover many topics of vital importance to the maritime industry. Each day will highlight a separate theme.

The program

April 5—Opening of congress—9:30-10, Keynote speakers. 10:20-12:20, "Shipbuilding Productivity and Implementation" of the Merchant Marine Act of 1970. Chairman: **Marvin Pitkin,** Asst. Administrator for Research & Development, MarAd. Panel members: **Roy Bowman,** Deputy Administrator for Program Implementation, MarAd; **Robert Galloway,** vice president, Sun Shipbuilding and Dry Dock Co.; **Daniel Mack-Forlist,** contracts manager and assistant to vice president, Shipbuilding Division, Bethlehem Steel Corp.; **Richard J. Baumler,** member, president's staff, Newport News Shipbuilding & Drydock Co.

April 6—Ports, Terminals and Shipping Operations—Moderator: **Gregory Halpin,** deputy director, Maryland Port Authority. 9:30-10, "The Port and Changes in Maritime Technology." Speaker: **W. Gregory Halpin,** deputy director, Maryland Port Authority. 10:20-11, "Computerization of Container Control and Cargo Documentation." Speaker: **Vincent Barba,** general manager, container operations, United States Lines. 11-11:30, "A Harbor Advisory System to Maximize Ship Safety and Minimize Traffic Delays in the Terminal Area." Speaker: **Tom Mara,** vice president, Marine Digital Systems, Inc. 11:30-12, "Ship-Based Housing Factories for Ports and Urban Areas." Speaker: **William Davis,** The Stanley Works.

April 7—Advances in Maritime Technology—Moderator: **Frank Kesterman,** Manager, Science and Technology Research, U.S. Maritime Administration. 9:15-9:45, "Advances in Heavy Duty Marine Gas Turbines." Speaker: **William Hefner,** research engineer, General Electric Corp. 10-10:50, "Maritime Research Information Service—What Is It and How To Use It," **Frank Kesterman,** Manager Science & Technology, U.S. Maritime Administration. 10:20-10:50, "A New System for Collision Avoidance at Sea." Speakers: **R. Riggs,** research engineer, Sperry Marine Systems Division; **J.R. Grymes,** head, department of control engineering, Sperry Marine Systems Division. 10:50-11:30, "Satellite Systems in Navigation, Communications and Traffic Control Applications." Speakers: **J. Chernof,** director, space navigation and tracking laboratory, I.T.T. Aerospace Laboratories; **Roy Anderson,** research scientist, General Electric Corporation; Comdr. **A. Fiore,** USMS, Asst. Head, Dept. of Nautical Science, U.S. Merchant Marine Academy. 11:30-12, "The Effects of Technological Change on the Merchant Seaman." Speaker: **Bertram Gottlieb,** director of research, Transportation Institute.

An afternoon session with international speakers will be presented. Moderator: **Don Ewart,** editor, Fairplay (London).

Admission to the congress is $25 per day, or $50 for the three days. Companies sending 10 or more delegates to one or more days will be allowed a 20 percent discount on the total amount. For additional details, contact Mariport Congress Bureau, 1601 West Lafayette Blvd., Detroit, Mich. 48216, telephone (313) 961-9044.

IT'S ALL IN THE FAMILY: Members of the Colbry family, all skilled sheet metal craftsmen at Lockheed Shipbuilding and Construction Company in Seattle, Wash., get some apt pointers from the head of the clan. From left to right are: **Don Jr.,** journeyman; **Doran,** who recently graduated from a three-year apprenticeship; **Don Colbry Sr.,** a 30-year sheet metal man, and **Donovan,** an apprentice.

Ishikawajima-Harima Delivers 50th Freedom Ship 'Acritas'

Approximate measurements of the Acritas are: 440 feet in length, 65 feet in breadth, 40 feet in depth, and a draft of 30 feet. Her main engine is a 5,130-bhp IHI-S.E.M.T. Pielstick diesel engine and provides a service speed of 13.6 knots.

The Acritas, a 14,800-dwt Freedom vessel, was delivered February 3 to the Pegasus Ocean Service group, Greece, by the Tokyo Shipyard of IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.), Japan.

The new ship is the 50th of 81 Freedom vessels so far ordered from IHI by shipowners in many countries, including the United States, the U.K., Greece, Hong Kong, the Republic of China, Italy, Switzerland and Kuwait.

The Freedom vessels, jointly designed by IHI and G.T.R. Campbell, a Canadian shipbuilding consultant, are multipurpose cargo ships built to carry various cargo such as ore, coal, grain, containers, automobiles, lumber and steel materials.

The first Freedom ship, the Khian Captain, was completed in 1967 and since then, Freedoms have been launched at the Tokyo Shipyard at intervals of 23 days under a mass-production system. With the increasing demand for Freedoms, IHI's Nagoya Shipyard also began construction of this type of ship. Of 50 vessels, 45 ships have been delivered by the Tokyo Shipyard and five by the Nagoya Shipyard.

On the other hand, Astilleros de Cadiz S.A. in Spain has completed six Freedoms since 1967, when it concluded a technical agreement for building Freedoms with IHI. Jurong Shipbuilders Private Ltd., a joint venture between IHI, the Singapore Government and Jurong Shipyard, will also commence construction of Freedoms in July this year.

Mechanical Marine Company Brochure Describes Liquid Cargo Handling Equipment

Mechanical Marine Company, Inc., Elizabeth, N.J., suppliers of liquid cargo handling equipment for 44 years, has published a new product brochure on its line of marine valves and fittings. Included are "Y," plate and basket strainers, suction bellmouths, ullage plates, valve operating stands, and a variety of deck drains and plugs.

Mechanical Marine Company is primarily known for their VAC-REL and MEMARCO products. The VAC-REL pressure vacuum relief valves were developed in 1927 for a specific need and since then, have been a standard in the marine industry. Also included are the VAC-REL inverted vent check valves and the MEMARCO high lift angle cargo valves.

All products are illustrated with descriptive text on four pages. To obtain your free copy, write for Bulletin MC-1, Mechanical Marine Company, 900 Fairmount Avenue, Elizabeth, N.J. 07207.

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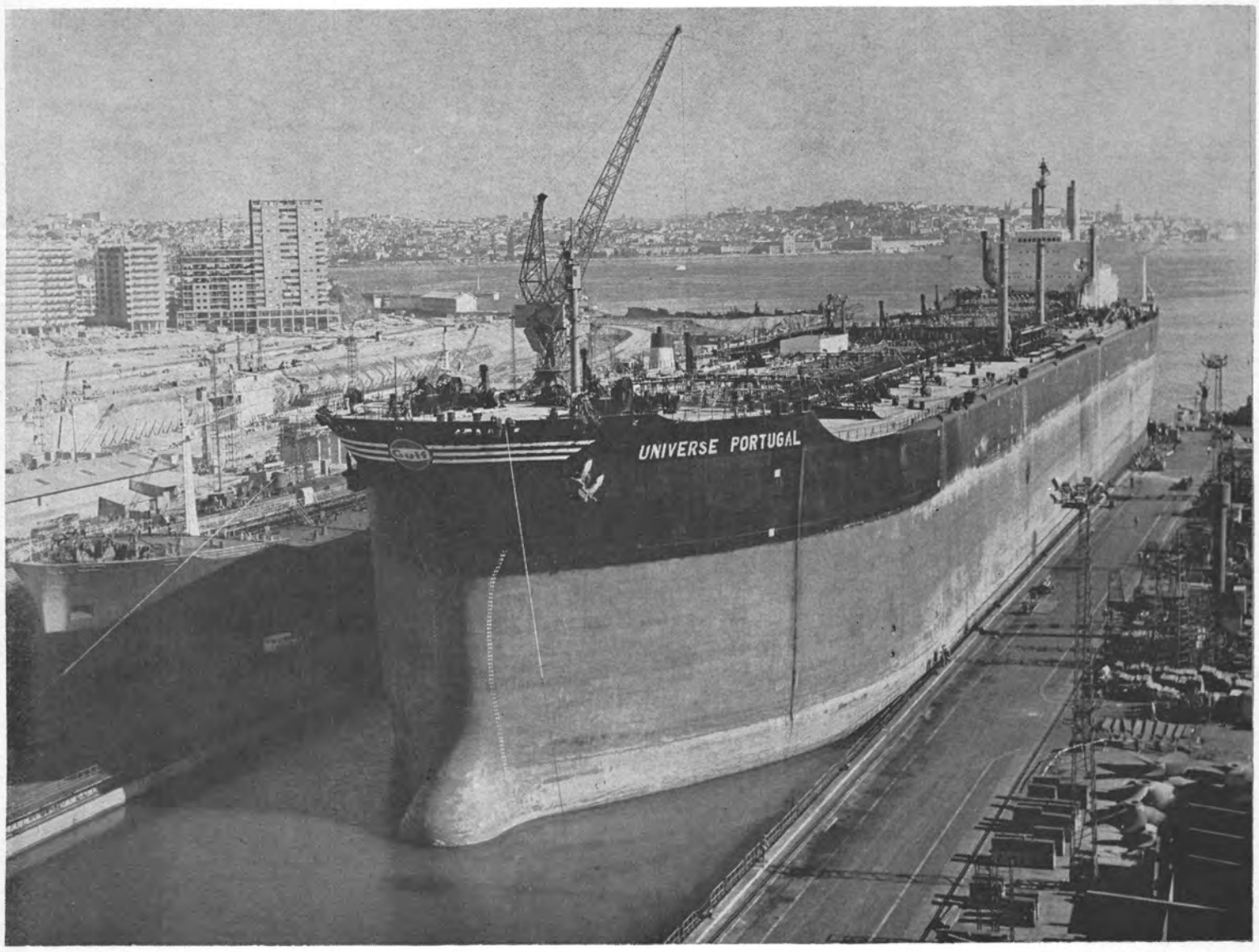

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LEAVING NEW ORLEANS: The 80-foot crew boats Cedar Creek and Port Republic, each capable of speeds of 33 miles per hour, were transported to Singapore on the large cargo deck of the Monarch.

Designed For Unlimited Range And Operation

Offshore Logistics' Monarch

Built By Halter Marine Services, The 185-Foot Monarch Joins Largest Fleet Of Towing And Supply Vessels Operating In Southeast Asia

Offshore Logistics, Inc., has increased the size of its fleet in Southeast Asia with the delivery of the 185-foot International Class towing and supply vessel Monarch. Built by Halter Marine Services, Inc., New Orleans, La., the ship sailed from Morgan City, La., for Singapore in mid-January for operation on the Malaysian concession of Esso Exploration. Offshore Logistics operates the largest fleet of offshore supply and crew vessels in Southeast Asia.

The Monarch is the fifth in a series of new offshore towing and supply ships designed for unlimited range and operation in remote areas of the world. The vessels in the new Offshore Logistics International Clipper fleet are among the largest and fastest in the world.

Two 80-foot high-speed crew boats were loaded onto the deck of the Monarch for the trip to Singapore. Built by Camcraft Inc., Crown Point, La., the two new vessels are the Cedar Creek and Port Republic.

The Monarch has an overall length of 185 feet, a beam of 39 feet, a depth of 15 feet, and a draft of 13 feet. Its displacement is 1,500 tons, and gross tonnage 299 tons. The cargo deck of the new ship has overall dimensions of 127 feet by 30 feet.

The vessel is powered by two General Motors 16-645 (EMD) diesel engines with Falk reversing/reduction gears. The primary propulsion system produces 5,600 total horsepower and maximum speed of 15.5 knots. The vessel has capacities for 1,400 barrels of fuel oil, 1,000 barrels of potable water, and 6,000 barrels of rig water. Bulk materials can be carried in 4,000 cubic feet of space, and 600 tons of deck cargo can be carried.

The all-welded steel vessel was built to United States Coast Guard and Lloyds 100+A1 standards, and has American Bureau of Shipping certificates for international service. The design of the ship incorporates the most advanced features required by the offshore industry. Four separate pneumatic tanks below deck have the capacity for 4,800 sacks of barite, or 4,000 sacks of cement. The unloading of the bulk material and the transfer of fuel, oil, water, and below-deck cargo can be completed in just over three hours, because of high capacity compressors and pumps.

A hydraulically-powered towing and anchor winch has the capacity of handling the largest anchors over five-foot-diameter stern rollers. This winch, along with the 5,600-horsepower engine system, also provides ocean-towing versatility. In addition, a hydraulic bow thruster increases the vessel's capability. A complete backup system has also been provided for all major power components to insure continuous operation under extreme conditions.

Accommodations are provided for 18 passengers in staterooms with built-in berths. Separate staterooms for the ship's crew of 10 are included. The complete galley is stainless steel and meets United States Public Health Standards. Central heating and air-conditioning are provided throughout for maximum comfort and efficiency.

The aluminum crew boats Cedar Creek and Port Republic are 80-foot vessels with a beam of 18 feet 4 inches, a draft of 5 feet, and a cargo deck area of 27 feet by 18 feet each. They each are powered by two General Motors 12V71TTA engines that produce 1,200 horsepower, and speeds up to 33 miles per hour. The crew boats are built to United States Coast Guard standards.

Fully air-conditioned, the 56 passengers on each boat will ride in specially-designed seats which can be converted into 14 bunks for periods of light passenger utilization. Separate crew quarters are included, along with separate heads for passengers and crew. The crew boats carry a full complement of electronic equipment, including a six-channel marine single sideband radio and Decca 202 radar.

Each crew boat has a fuel oil capacity of 1,200 barrels and can carry 10 tons of cargo on its aft deck.

Offshore Logistics, Inc., is the parent company for a group of wholly-owned subsidiary corporations which own and operate crew boats and supply vessels designed for service in the offshore petroleum and related ocean industries. Administrative and executive headquarters are in Lafayette, La. Domestic operations are based in Morgan City. In 1970 an operational headquarters was established in Singapore.

Shipbuilders Council Releases 1971-1976 Forecast Of Private Shipyard Revenues

Continuing the custom started several years ago, the Shipbuilders Council of America has released a five-year forecast of private shipyard revenues which will be published in the Council's Annual Report:

Estimated Annual Avg. 1971-1976 (Millions of Dollars)

Ship Construction	Low	High
MERCHANT FLEET		
Tankers	$ 75	$ 250
Subsidized Vessels	300	600
Nonsubsidized Dry Cargo Vessels	75	150
Great Lakes Vessels	15	50
Small Vessels	30	75
Nonpropelled Vessels	100	200
Ship Repair & Conversion	300	450
Total Merchant Fleet	$895	$1,775
NAVAL FLEET		
Ship Construction & Conversion	$1,230	$1,530
Ship Repair & Alteration	200	300
Total Naval Fleet	$1,430	$1,830
OTHER SHIPWORK		
MSC, U.S. Coast Guard Corps of Engineers, Fisheries Oil Drillings Rigs, etc.	$ 95	$ 160
Aggregate Total	$2,420	$3,765

Note: Estimates represent "Dollars for Shipyard Work" only. High side of ranges assumes full Congressional funding for the new maritime program and accelerated expenditures to upgrade the naval fleet.

HEAVY-DUTY GAS TURBINES for marine propulsion are discussed by Broken Hill Proprietary Company, Ltd. officials from Melbourne, Australia, on recent visit to General Electric in Schenectady, N.Y. On a worldwide trip, **James McGeachie,** left, manager of shipping operations, and **Robert McLennan,** right, manager of shipping, both Broken Hill Proprietary, discuss with **Whitman Ridgway,** deputy division general manager of GE's gas turbine operations, their order for two 17,500-hp Model 5000 heavy-duty gas turbines to be used for propulsion of two roll-on/roll-off special products carriers. Mr. **McLennan** estimates that $100,000 per ship per year can be saved by using heavy-duty gas turbines to propel the ships because of ease of manning and reduced maintenance. The ships are scheduled for launching in 1972.

Japan's NKK To Launch 1.66-Million Dwt In '71

Japan's only fully integrated shipbuilder-steelmaker, NKK (Nippon Kokan), will launch 20 vessels in 1971, aggregating 1,656,070 deadweight tons, a 13.4 percent increase over 1,460,000-dwt launched in 1970.

Hiroo Ikematsu, NKK-New York shipbuilding department manager, said the company's Tsu Yard in central Japan, completed in December 1969, will launch five vessels, representing 1,024,560-dwt of the total. These ships include two 250,000 tankers and one 210,000 ore/oil carrier. Last year, Tsu launched three 250,000-dwt class tankers.

NKK's Tsurumi Shipyard near Tokyo is scheduled to launch seven vessels totaling 475,410 deadweight tons. Among these will be a 51,300 gross ton containership. This is the first vessel to be launched from the Yard's No. 2 berth, which is being expanded to 160,000-dwt capacity.

The company's Shimizu Shipyard near Tokyo will launch eight vessels aggregating 156,100 deadweight tons. These are principally specialty ships, catamaran ferry boats, and 20,000-dwt bulk carriers.

Bethlehem Names Filip General Manager San Francisco Yard

Patrick G. Filip

The appointment of **Patrick G. Filip** as general manager of Bethlehem Steel Corporation's San Francisco shipyard has been announced by **Walter F. Williams,** vice president, shipbuilding. The appointment will be effective April 1.

A veteran ship repairer with more than 35 years of experience in the field, Mr. **Filip** has been assistant manager of the San Francisco yard since April 1968. He will succeed **William C. Brigham,** who will become assistant vice president, shipbuilding, on April 1.

A native of Hoboken, N.J., a major ship repair center since the mid-1800s, Mr. **Filip** began his career during the summers of 1934 and 1935, when he worked for the Seaboard Marine Co. as a mechanic, doing hull and carpenter work. He joined the Bethlehem organization in June 1936 as a clerk in the carpenter department of the firm's former ship repair yard at 56th Street, Brooklyn, N.Y. He subsequently served there and at Bethlehem's Hoboken yard as a supervisor, estimator, assistant chief estimator, and chief estimator. In April 1968, he was transferred to the San Francisco yard and named assistant manager.

Mr. **Filip** was graduated from New York University with a business administration degree in economics. He is a member of The Society of Naval Architects and Marine Engineers.

Sky Climber Introduces New High Lift Hoist

Sky Climber, Inc., a subsidiary of Western Gear Corporation, Gardena, Calif., has developed a High Lift Material Hoist which replaces conventional drum hoists with a capstan design that provides unlimited height of lift.

Portable in design and equipped with constant speed controls, the new High Lift Material Hoist can be positioned at the top, middle, or grade level of a construction project. Pushbutton controls may be located at the hoist position, or a remote location.

The hoist has a safe weight load limit of 1,500 pounds, and features a powered wire winder on which the tail line is accumulated. Accessories include a boom, a topping hoist, and remote control devices.

E. Canadian Section Hears Paper On 'Undersea Activity'

Co-authors of the technical paper presented during the meeting. **G.A. Kastner** (left) and Lt. Comdr. **J.R. McFarlane.**

The Eastern Canadian Section of The Society of Naval Architects and Marine Engineers held its January meeting in Ottawa, Ontario, at the Bytown Officers' Mess.

"Canadian Undersea Activity" was the subject of the paper which was jointly presented by **G.A. Kastner,** P. Eng., vice president, International Hydrodynamics Company Limited, and Lt. Comdr. **J.R. McFarlane,** B. Sc., M.S. Nav. Eng., Canadian Armed Forces Staff College.

In the presentation, the authors outlined the developments of underwater technology in Canada and presented slides showing the vast continental shelf surrounding the coast of Canada, which one day will be the object of intense study by undersea vehicles.

A brief description of the SDL 1, recently purchased by the Canadian Armed Forces, was touched upon during the presentation.

Following the paper, there was a very interesting discussion from the floor, after which the authors were graciously thanked by Com. **N.D. Brodeur.**

Port Of Oakland Marine Terminals Brochure Available

A new 32-page four-color Port of Oakland marine terminals brochure has been published and is now available to the shipping and commerce community.

The booklet provides information on a variety of aspects concerning Northern California's largest port, including container and general cargo terminal facilities; rail, truck and air transportation services; data on steamship lines that call at Oakland; distribution and warehouse facilities and services; and planned terminal developments.

Receiving special emphasis are the new container and other automated freight handling facilities and equipment that in eight years have spurred Oakland's growth into the West Coast's largest containerized cargo port and number two container port in the world.

The brochure is available without charge and can be obtained by contacting the Public Relations Department. Port of Oakland, 66 Jack London Square, Oakland, Calif. 94607.

Hapag-Lloyd And Holland-America Line Form Combi Line

Hapag-Lloyd and Holland-America Line will jointly operate their present cargoliner services between U.S. Gulf and South Atlantic ports and North Continental Europe as from April 1, 1971. The new combined service will operate under the trade name Combi Line.

By integrating shipping schedules, weekly sailings from Houston and New Orleans will be offered, plus improved coverage of other Gulf ports such as Beaumont and Mobile, as well as South Atlantic ports.

Combi Line will provide increased container facilities on fast modern vessels which are also equipped to carry general and reefer cargo as well as heavy lifts. Inbound services from continental and U.K. ports will be strengthened likewise.

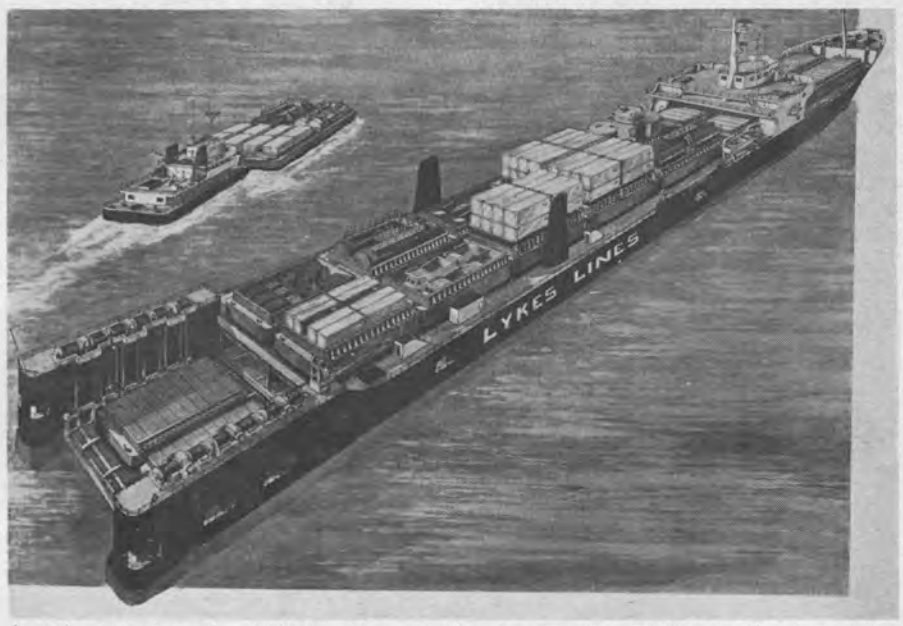
Next year, the line will offer a LASH-type service with two 43,000-ton barge carriers presently under construction in Belgium.

Biehl & Co. have been appointed general agents in the U.S.A. for all vessels loading after April 1, 1971. Halnav, Inc., 17 Battery Place, New York, N.Y., have been appointed as booking and marketing agents for the Combi Line in the northeastern U.S.A. territory.

Rapidly Taking Shape—

The Doctor Lykes

The Quincy Yard Of General Dynamics Passes The 50 Percent Completion Mark For Steel Erection On The First Of Three SEABEES For Lykes Bros.



Artist's rendering of a SEABEE ship unloading barges. The 2,000-ton elevator at the stern is about to discharge two more barges. The new ships will enter service in 1972.

In mid-January, six months after her keel laying, the Doctor Lykes passed the half-way mark in steel erection. Her sisterships, the Tillie Lykes and Almeria Lykes, were in the steel-cutting and fabrication phases at this point.

These extraordinary ships posed unique design, construction and quality control challenges for their builder, the Quincy Shipbuilding Division of General Dynamics, Quincy, Mass.

The SEABEES, as these ships are known, were conceived by **Frank A. Nemec,** president of Lykes Bros. Steamship Company, and designed by the New York naval architectural firm of J.J. Henry Co., Inc. The first three are now being constructed for approximately $100 million, with the aid of a maritime subsidy. Under the terms of the contract, General Dynamics will collect a bonus of $3,500 for each day the ships are delivered ahead of schedule, and will pay the same penalty for each late day.

Lloyd Bergeson, general manager of the Quincy shipyard, intends to collect on the bonus. Since taking the helm in October, 1969, Mr. **Bergeson** has delivered five Navy ships on or ahead of schedule, and is building the three SEABEES at a record-setting pace.

Mr. **Nemec** began developing the SEABEE concept in 1964 following a trip to Russia where he observed Soviet maritime progress. He was dismayed by the advances he saw and annoyed by the lack of such progressive thinking in the United States. Motivated by this Russian trip, Mr. **Nemec** determined to force a major breakthrough in the state of the maritime art.

"We wanted a ship that would do what no other merchant ship had done before," he recalled later.

He wanted a ship so flexible she could serve undeveloped coastlines and waterways as well as established ports, so economical she could out-perform other ships, so versatile she could carry all manner of cargoes in all transport modes singularly or in combinations.

The ship that evolved and now taking shape at Quincy, promises a limitless spectrum of applications, from barge carrier to tanker, from containership to roll-on/roll-off transport or any combination thereof, in either commercial or military service.

Because of her design and multiple missions, the SEABEE has impressive statistics. She will measure 875 feet overall and displace 51,000 tons fully loaded. Her 106-foot beam will allow passage through the Panama Canal, and her powerplant of 36,000 shp will make her one of the most powerful single-screw merchant ships on the seas. Her long length and fine lines will enable her to make 22.1-knot trial speed at a 28-foot draft.

One SEABEE can carry 23,500 tons of cargo in 38 barges on three decks, or 1,800 standard 20-foot containers, equivalent to 2.3 million cubic feet of cargo. The ship also can transport a combination of both barges and containers.

As a military carrier, she is capable of a 15,000-mile voyage and can carry as many vehicles as could clog 5.7 miles of a single-lane highway. In addition, tankage is available for up to 15,000 tons of fuel.

The SEABEE design is flexible primarily because of her elevator and transport system. This is a self-contained unit so the ship does not have the cargo limitations of traditional crane lifts.

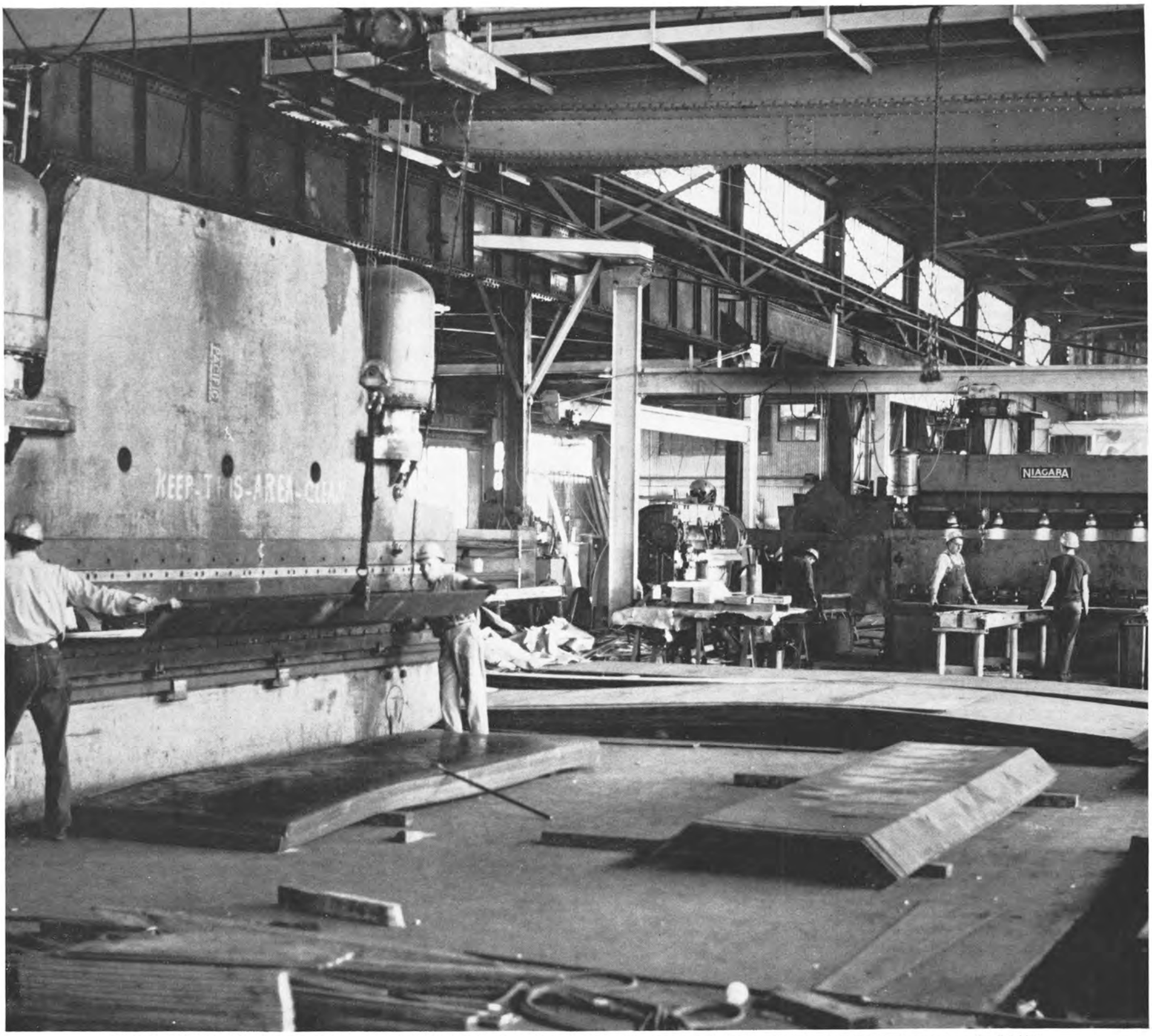
This system is the product of an engineering effort participated in by Lykes, J.J. Henry Co., General Dynamics, the Rucker Company, Western Gear Corporation, General Electric and others. The original engineering was started nearly three years prior to the award of the ship-construction contract.

The most dramatic aspect of the emerging dream, Mr. **Nemec** feels, is that the revolutionary SEABEES offer the industry and commerce of the United States "a completely unfettered and unlimited choice of the kind of ships needed to carry its cargo to and from foreign destinations."


The first intermodal/barge carrier as it nears 50 percent completion of its steel structure in only six months after keel laying at the Quincy yard.


This stern view shows the cantilever sections extending beyond the stern. In the foreground are the first two girders for the elevator platform.


Landing a 95-ton upper deck section on the Doctor Lykes on January 20 brought the steel erection to over 50 percent completion for the first ship.



Jeffboat's 525′ long plate-processing building is equipped to meet the tough demands of burning, shearing and bending steel for precision assembly and quality finishing.

A major chemical company wanted two highly specialized chemical barges

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One of these 195′ by 35′ barges required stainless steel cargo tanks, the other a special tank treatment. Both needed sophisticated external coating systems for exposure to a salt atmosphere. Jeffboat construction will provide the ruggedness and durability that delivers long service under rigorous product and environmental conditions. Jeffboat is fully equipped to handle your special marine requirements, too—design, construction or repair. Call us. (812) 283-3551. Jeffersonville, Indiana 47130.

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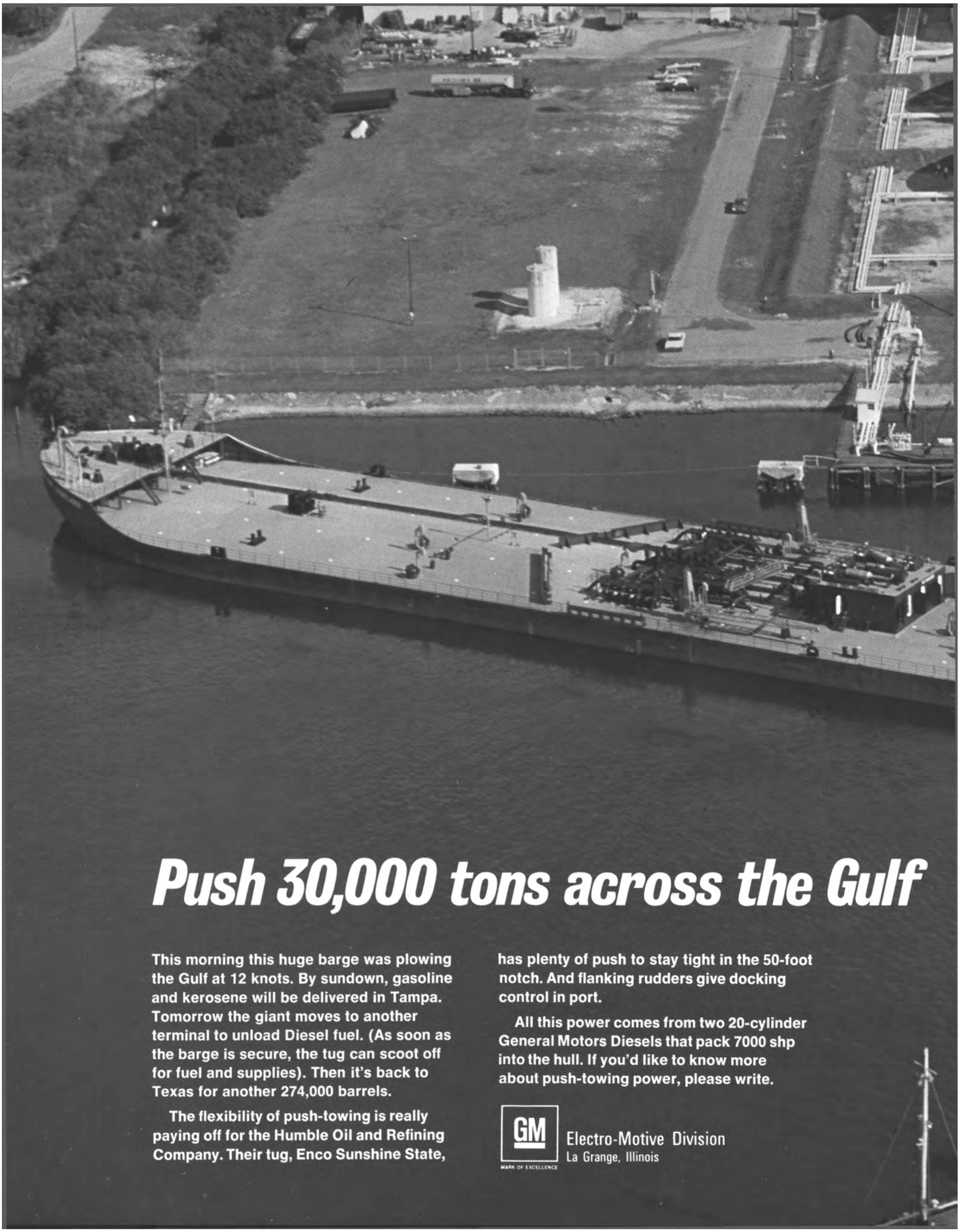
A division of Texas Gas Transmission Corporation



Push 30,000 tons across the Gulf

This morning this huge barge was plowing the Gulf at 12 knots. By sundown, gasoline and kerosene will be delivered in Tampa. Tomorrow the giant moves to another terminal to unload Diesel fuel. (As soon as the barge is secure, the tug can scoot off for fuel and supplies). Then it's back to Texas for another 274,000 barrels.

The flexibility of push-towing is really paying off for the Humble Oil and Refining Company. Their tug, Enco Sunshine State, has plenty of push to stay tight in the 50-foot notch. And flanking rudders give docking control in port.

All this power comes from two 20-cylinder General Motors Diesels that pack 7000 shp into the hull. If you'd like to know more about push-towing power, please write.

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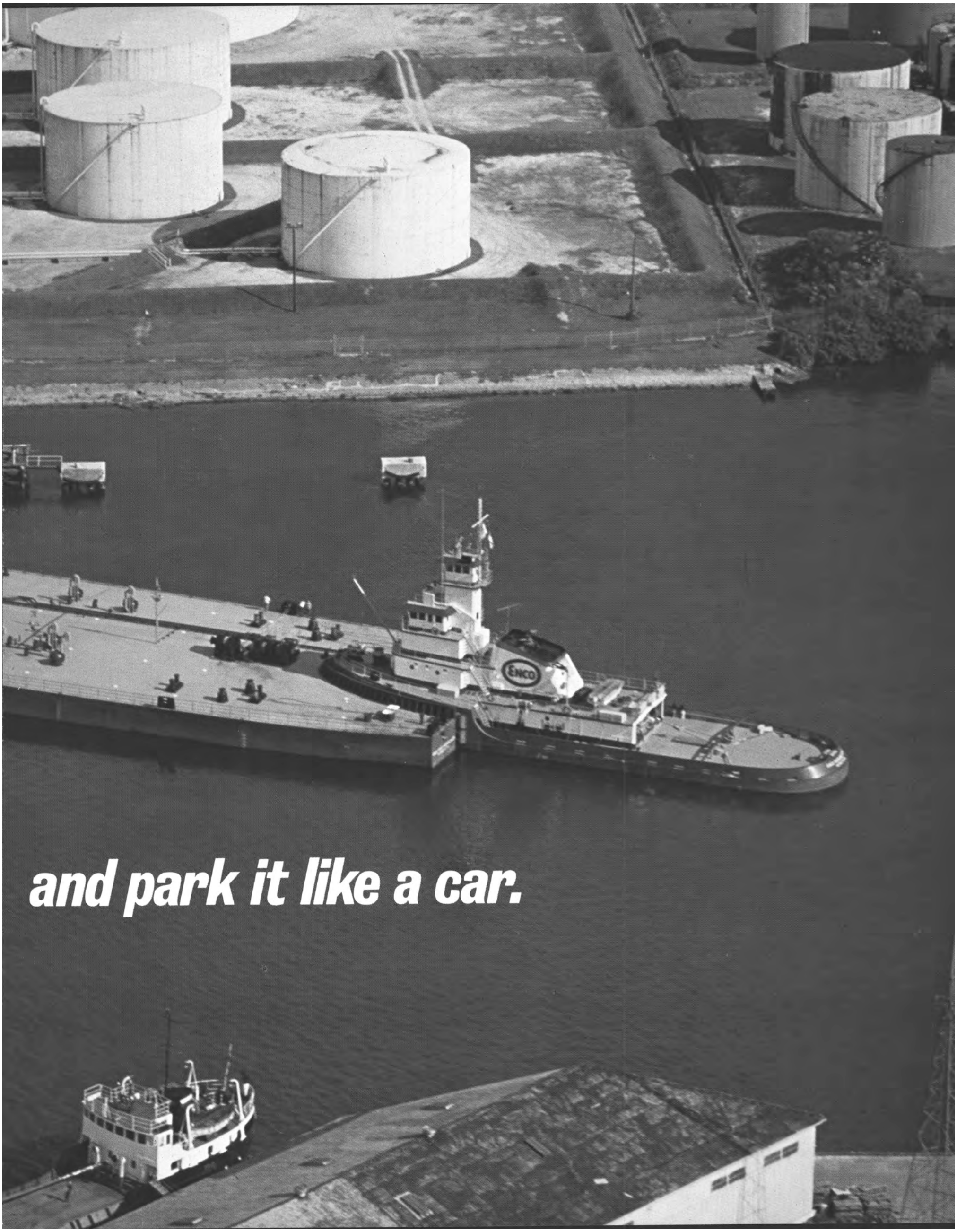
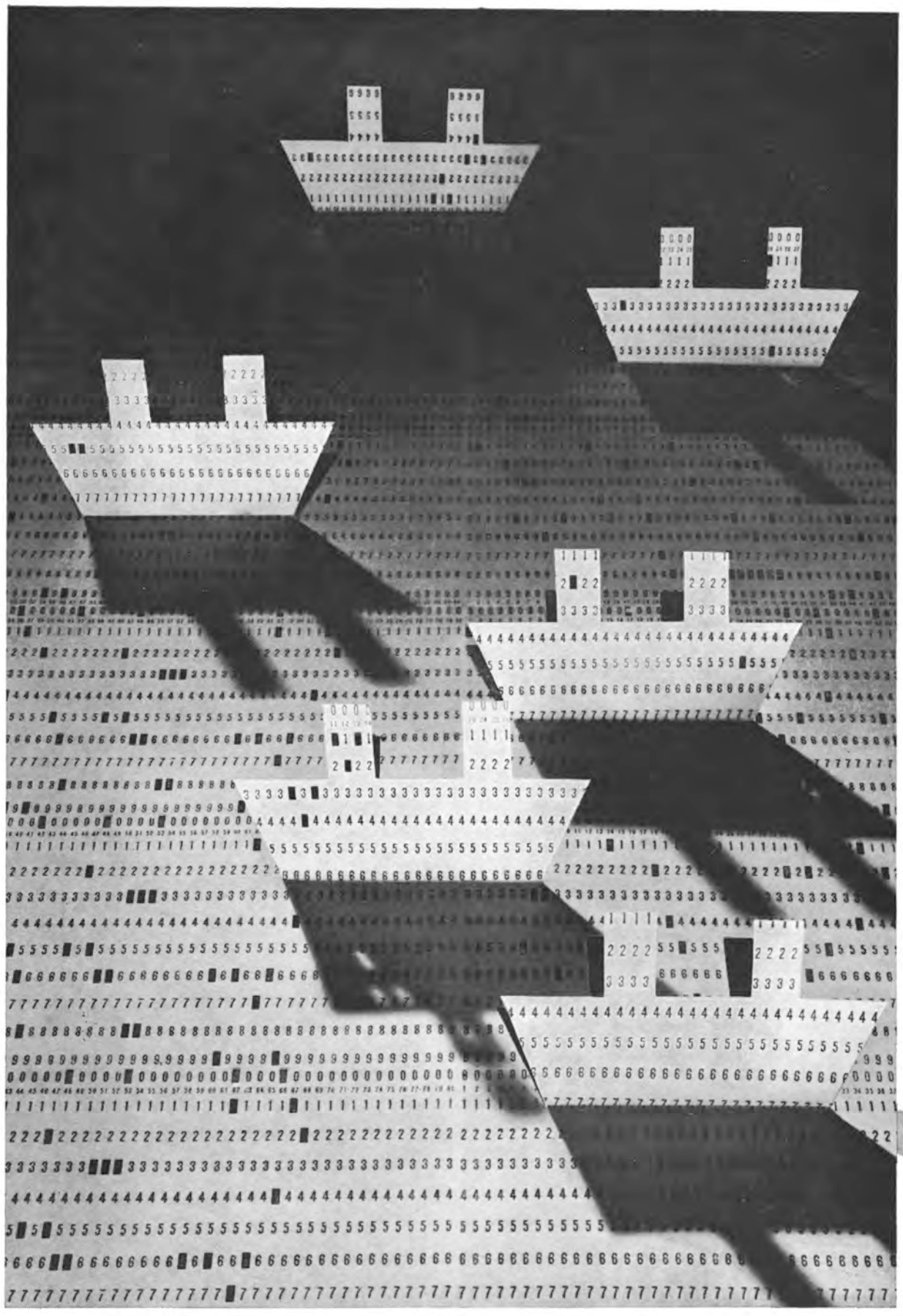

ENCO
and park it like a car.



Computer-built ships come from Hitachi Zosen

213,000 DWT Olympic Adventure.
Hitachi Zosen delivered the Olympic Adventure to Colbeck Marine Panama, South America of the Onassis Group. The new supertanker is the largest of the 200,000-ton class capable of passing through the Suez Canal. The unique design allows for segregated oil cargo loading at the ratio of 50:50 or 25:75.

Do yourself a favor. Come to us for your next ship. Why?
We have an automatic numerical-control system.
We call it "HIZAC" system (Hitachi Zosen Auto Coding.)
Thanks to this system, designing, marking and cutting of steel is "precisely" synchronized. Plus planning preparatory time is short.
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it cuts down on the working hours and thus the cost of highly-skilled workers.
Yet "HIZAC" is only a part of our many practical engineering ideas.
We have five shipyards which produce "new" ships efficiently, and "repair and remodel" old-fashioned ships into modern bigger capacity vessels, too.
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McNeal Elected Board Chairman Of AWO Officers Reelected — New Directors Named

William C. McNeal, executive vice president of Oil Transport Company, Incorporated, New Orleans, La., was elected chairman of the board of The American Waterways Operators, Inc. at the annual meeting of the nationwide trade association of the barge and towing industry. He succeeds **Peter J. Brix,** president and general manager of Knappton Towboat Company, Portland, Ore., who has served as AWO chairman for the last year. Mr. **Brix** continues as a director of the Association.

William C. McNeal

Braxton B. Carr was elected to his 15th annual term as president of the Association, which has headquarters in Washington, D.C., and field offices in New York and New Orleans.

William E. Cleary was elected to his 16th annual term as secretary-treasurer. He operates the Association's North Atlantic Regional Office in New York City.

A native of Altoona, Pa., Mr. **McNeal** has been associated with Oil Transport Company, Incorporated since 1953. He began his employment with the company as a deckhand, and today, in addition to serving as executive vice president, is a director of the company.

The new AWO chairman was graduated from Altoona public schools and, in 1951, from Cornell University in Ithaca, N.Y. He served in the U.S. Air Force as a transportation officer in the United States and in the Far East during the Korean conflict. He is now a member of the Retired Reserve.

Mr. **McNeal** served as a director of the Association in 1964, 1965, 1968 and 1969. In 1965 and 1969, he served as vice president of Region 3 of AWO, which encompasses the Gulf Coast and lower Mississippi River. Mr. **McNeal** also has served as chairman of AWO's Coast Guard liaison committee since 1968. In 1963 and 1964, he served as chairman of the Association's safety committee, and as a member of the legislative committee since 1965.

The new AWO chairman has been a member of the Western Rivers Panel, Merchant Marine Council, an industry advisory group to the United States Coast Guard, since 1968. He is a director of the National Waterways Conference and a member of the traffic advisory and pollution advisory committees of the Water Resources Congress.

Mr. **McNeal** is a member of The Propeller Club of the United States, Port of New Orleans, The Plimsoll Club, Marine Club, Delta Safety Society and Timberlane Country Club, all in New Orleans.

The following new directors of AWO took office at the annual board meeting, which was held in Washington, D.C.: **Jack W. Campbell,** president, Mobile Towing Company, Mobile, Ala.; **J.R. Ferguson,** transportation manager, Tenneco Oil Company, Houston, Texas; **Howard Guttman,** of Mon River Towing, Inc., Belle Vernon, Pa.; **Bruce D. Hobbs,** president and general manager, Albina Engine and Machine Works, a division of Dillingham Corporation, Portland, Ore.; **Ralph W. Hooper,** of Interstate Oil Transport Co., Philadelphia, Pa.; **E.H. Jensen,** vice president of Supply and Distribution, Standard Oil Company (Kentucky), Louisville, Ky.; **John H. Lee,** president, Alaska Hydro-Train, Seattle, Wash.; **Glen W. Maxon Jr.,** executive vice president, Maxon Corporation, Dayton, Ohio; **Jack D. Minkler,** vice president of administration, Foss Launch & Tug Co., Seattle, Wash.; **Thomas E. Moran,** president, Moran Towing Corporation, New York, N.Y.; **Arthur A. Riedel,** president, Willamette Tug & Barge Co., a division of Willamette-Western Corp., Portland, Ore.; **Ed A. Smith,** president, Alamo Barge Lines, Houston, Texas; **T.J. Stahl,** of A.L. Mechling Barge Lines Inc., New Orleans, La., and **William J. Wolter,** president, Waterfront Services Co., Cairo, Ill.

The AWO board is made up of 47 water carrier executives from throughout the United States.

Re-elected to the board were: Capt. **J.R. Ayers Jr.,** vice president, Loumiet Enterprises, Inc., Harvey, La.; Capt. **C.V. Gearin,** manager, Inland Waterways Operations, Marine Transportation Department, Mobil Oil Corporation, New York, N.Y.; **A. Giallorenzi,** Marine Department, Humble Oil & Refining Company, Bayonne, N.J.; **James P. McAllister,** president, McAllister Lighterage Line, Inc., New York, N.Y.; **F.A. Mechling,** executive vice president, A.L. Mechling Barge Lines Inc., Joliet, Ill.; **Jerry L. Page,** president, Southern Barge Line Corporation, Paducah, Ky.; Capt. **William S. Streckfus,** vice president, Streckfus Steamers, Inc., St. Louis, Mo.; **L.P. Struble Jr.,** group vice president, Dravo Corporation, Pittsburgh, Pa.; **J.W. Von Herbulis,** president, Pittston Marine Corporation, New York, N.Y., and **Howard A. Watters,** vice president, transportation, Central Soya Company, Inc., Fort Wayne, Ind.

Other AWO directors, in addition to Mr. **Brix,** who continue in office are: **F.T. Ainsworth,** manager, U.S. Area Marine Distribution and Traffic, The Dow Chemical Company, Freeport, Texas; **Lester C. Bedient,** general manager, Harbor Carriers, San Francisco, Calif.; **Jesse E. Brent,** president, Brent Towing Company, Inc., Greenville, Miss.; **Francis B. Bushey,** president, Spentonbush Transport Service, Inc., New York, N.Y.; **John M. Donnelly,** executive vice president, Ingram Barge Co., New Orleans, La.; **C.C. Ellisor,** Texaco, Inc., Mount Vernon, Ind.; **J. Melton Garrett,** vice president, Avondale Shipyards, Inc., New Orleans, La.; **T.E. Garside,** vice president, Pacific Inland Navigation Company, Inc., Seattle, Wash.; Capt. **Noble L. Gordon,** president, Mid-South Towing Company, Tampa, Fla.; **Walter F. Hagestad,** executive vice president, Canal Barge Company, Inc., New Orleans, La.; **Robert J. Hughes,** president, James Hughes, Inc., New York, N.Y.; **John W. Lambert,** president, Twin City Barge & Towing Company, St. Paul, Minn.; **William E. Law,** president, Allied Towing Corporation, Norfolk, Va.; **M.E. Midgley,** executive vice president, Nilo Barge Line, Inc., St. Louis, Mo.; Capt. **C.C. Rasmussen,** president and general manager, Bay and River Navigation Company, Richmond, Calif.; **Edward Renshaw,** president, St. Louis Ship, St. Louis, Mo.; **Thomas J. Rohs,** vice president-treasurer, M/G Transport Service, Inc., Cincinnati, Ohio; **William R. Saul,** president, Steuart Transportation Company, Piney Point, Md.; **George H. Shaver,** executive vice president, Shaver Transportation Company, Portland, Ore.; **Frank P. Silliman,** president, Hillman Transportation Company, Pittsburgh, Pa., and **Paul Walker,** president, Walker Boat Yard, Inc., Paducah, Ky.

Paper On Contrarotating Propellers Presented At SNAME Chesapeake Meeting

Attending the Chesapeake Section meeting were: (seated, left to right) **F. Ebel, R. Schubert** and **R. Falls,** all of the Maritime Administration; (standing, left to right) **J. Strom-Tejsen,** Naval Ship Research and Development Center; **P. Eisenberg,** Hydronautics, Inc.; **M. Pitkin,** Maritime Administration; **R. Mende,** national secretary of SNAME, and **L. Hoffman,** Maritime Administration.

Over 100 members and guests attended the fifth scheduled meeting of the season for the Chesapeake Section of The Society of Naval Architects and Marine Engineers which was held at the Washington Navy Yard Officer's Club on February 11, 1971. Included among the guests for the buffet dinner and technical session was **Robert G. Mende,** secretary of the Society.

Following the dinner, **Philip Eisenberg,** chairman of the Chesapeake Section, introduced Capt. **Richard T. Miller,** USN (ret.), who presented an overview of the activities of the marine systems committee. Mr. **Mende** then briefly addressed the meeting, commenting on, among other things, the forthcoming spring meeting in Hawaii.

The paper "A Comparison of Contrarotation Propellers with other Propulsion Systems" was presented during the technical session. This paper outlines the design changes necessary for the conversion of a containership from a twin-screw power plant to a contrarotation power plant. The costs of the two ships are compared, and an economic analysis of the differences in fuel costs is given. Most importantly, the results of a series of model tests with the same basic model are included — the original twin-screw ship, various contrarotating propulsion tests (with a new single-screw-type stern) at different torque ratios, single-screw tests, and overlapping propeller tests.

Three of the four authors made the presentation. **R. Falls,** of the Maritime Administration gave the introduction and background to this project. **R. Schubert,** also of the Maritime Administration, presented the section on the various propulsion systems arrangements studied, while **J. Strom-Tejsen,** of the Naval Ship Research and Development Center, presented the results of the model experiments. **C.H. Gross Jr.,** of the Mardeg Corporation was the remaining author.

Frank Ebel of the Maritime Administration acted as moderator for the technical session. Comments on the paper were given by **T. Simpson,** General Electric Company; **W. Budd,** DeLaval Turbine Company; **R. Kiss,** Maritime Administration, and **J. Hadler** and **R. Boswell,** both of the Naval Ship Research and Development Center.

SNAME Pacific NW Section Meets In Vancouver —Hears Paper On Modern Small Submersibles

Participants shown above are: (standing, left to right) **David Moreira,** discussor, Lockheed Offshore Petroleum Services Ltd.; **F.P. Miller,** secretary-treasurer, British Columbia area; **George Veres,** introducing discussor, Interport Consultants Ltd.; **Tom Harrigan,** papers chairman, and **Lou Chirillo,** vice chairman, both Pacific Northwest Section; (seated, left to right) **Michael MacDonald,** author, International Hydrodynamics Ltd.; **George Fryatt,** chairman, British Columbia area, and **Peter Sias,** chairman, Pacific Northwest Section.

When the Pacific Northwest Section of The Society of Naval Architects and Marine Engineers met in Vancouver, British Columbia, on February 5, sixty-two members and guests were presented with a description of the piscine nature of modern small submersibles and their excursions into the realm of Neptune.

As **Michael MacDonald** of International Hydrodynamics Limited presented his paper entitled "Submersible—What, Why, How," a picture of a family of submersibles evolved which were designed for increasing depths, endurance, lift capacity and work tasks. "There is a difference between submarines and submersibles," explained Mr. **MacDonald.** "A submersible is dependent upon a surface support ship." The use of special alloys for pressure components, fiberglass for non-pressure applications, a system for exposing battery electrolyte to sea pressure, and the novel use of external bladders to capture and hold-for-retrieval the ballast oil "dumped overboard" were described, as well as many other such features.

Further in his discussion, Mr. **MacDonald** described actual work situations using special manipulators in submersibles designed for 3,500-foot depth. He described adaption for diver "lock-out" wherein divers descended in a "shirt-sleeve" atmosphere before being conditioned for entry to the sea, pointing out that current models are designed to exceed even the probable human limit of 600-foot depth. Also included was a description of current construction, designed for 6,500-foot depth, with HY 100 steel hulls, precision machined inside and out to American Bureau of Shipping standards.

Formal discussion by **Dave Moreira** of Lockheed Offshore Petroleum Services Ltd., and **Charles Kosonen** of Arctic Marine Ltd., described a need for more practical and safer recovery equipment at increased sea states. It was noted that currently we are a long way from safe launch and retrieval in other than a relatively calm sea.

The role of the American Bureau of Shipping (ABS) was handled in discussion which disclosed that in the absence of any existing rules for the construction of small submersibles, ABS is fulfilling the important task of collecting peculiar engineering and operational data. Processing of these data, it was described, has already yielded certain minimum standards which are offered as guidelines and which will eventually evolve into published rules for classification. There is, it was noted, a very critical need for rules applying to weight control, as in some submersibles "droppable" weight did not compensate for the flooding of "hard" tanks. Concluding discussion emphasized that ABS has influenced a trend toward engineering substituting for trial-and-error design processes.

LOCKHEED DELIVERS LPD-14: Lockheed Shipbuilding and Construction Company recently delivered the 16,500-ton LPD-14 Trenton to the U.S. Navy. The Trenton, launched in August 1968, completed its acceptance trials in January. The 570-foot-long amphibious assault transport was towed by tug across Puget Sound from Lockheed's Elliott Bay Shipyard No. 2 to a dock at Puget Sound Naval Shipyard in Bremerton, Wash. The vessel was commissioned this month. LPDs, of which Lockheed has delivered six and has one, the LPD-15 Ponce, to complete under the current Navy contracts, are named for cities which bear names of the developers of America. The Trenton is named for **William Trent,** prominent colonial merchant and public servant who in 1721 laid out Trent's Town, forerunner of the present Trenton, N.J. LPDs, one of the more unusual ships in the U.S. Navy's inventory, have a stern gate that will open to the sea. The ship, utilizing internal ballast tanks and pumps, sinks eight feet, allowing the sea and boats to run into a cavernous well deck. The ship can launch helicopters from a flight deck or landing craft from the well deck.

SNAME Announces Committee Chairmen

Daniel D. Strohmeier, president of The Society of Naval Architects and Marine Engineers, a professional society for members of the marine industry, announces the following committee chairmen for 1971:

Committee on Applications — chairman, Rear Adm. **L.V. Honsinger,** USN (ret.), vice president, shipbuilding, Todd Shipyards Corporation, New York, N.Y.

Committee on Awards — chairman, **Andrew Neilson,** chairman of the board, American Bureau of Shipping, New York, N.Y.

Annual Banquet Committee — chairman, **Everett A. Catlin,** Power Generation Division, The Babcock & Wilcox Company, New York, N.Y.

Annual Dinner Dance Committee—chairman, **Preston H. Hadley Jr.,** vice president, Gibbs & Cox, Inc., New York, N.Y.

Committee on Endowment Fund —chairman, **William C. Freeman,** general manager, Marine Division, Combustion Engineering, Inc., Windsor, Conn.

Committee on Finance and Audit—**James H. Sharp,** member, advisory board, Marine Midland Bank, New York, N.Y.

Committee on Journal of Ship Research — chairman, **Ralph D. Cooper,** program director, Fluid Dynamics, Office of Naval Research, Department of the Navy, Arlington, Va.

Committee on Marine Technology — chairman, **E. Scott Dillon,** Chief, Office of Ship Construction, Maritime Administration, Washington, D.C.

Committee on Membership — chairman, **Lester Rosenblatt,** president, M. Rosenblatt & Son, Inc., New York, N.Y.

Committee on Nominations — chairman, **James J. Henry,** president, J.J. Henry Co., Inc., New York, N.Y.

Committee on Papers — chairman, Capt. **Jack A. Obermeyer,** USN (ret.), manager, Construction & Technical Development Division, Marine Department, Texaco, Inc., New York, N.Y.

Committee on Pension Plan — chairman, **William H. Jory,** vice president, J.J. Henry Co., Inc., Washington, D.C.

Committee on Publications — chairman, **A. Dudley Haff,** technical manager, Central Technical Division, Shipbuilding, Bethlehem Steel Corporation, Sparrows Point, Md.

Committee on Public Relations —chairman, **John R. Blackeby,** secretary, American Bureau of Shipping, New York, N.Y.

Committee on Scholarships — chairman, **Frank L. Pavlik,** Sun Shipbuilding & Dry Dock Co., Chester, Pa.

Committee on Sections — chairman, **Monroe D. Macpherson,** tanker department, Esso International, Inc., New York, N.Y.

Committee on Ways and Means —chairman, Rear Adm. **Albert G. Mumma,** USN (ret.), chairman, Worthington Corporation, Harrison, N.J., and past president of the Society.

Steering Committee for the 1971 Spring Meeting—chairman, **Ian M. Smith,** Pearl Harbor Naval Shipyard, Pearl Harbor, Hawaii.

Technical and Research Steering Committee—chaired by **Barton B. Cook Jr.,** vice president, De Laval Turbine, Inc., Trenton, N.J., includes the chairmen of the following committees:

Ship Production Committee — chairman, **Daniel M. Mack-Forlist,** assistant vice president and manager of contracts, Bethlehem Steel Corporation, New York, N.Y.

Hydrodynamics Committee — chairman, Dr. **William E. Cummins,** head, Department of Hydromechanics, Naval Ship Research and Development Center, Washington, D.C.

Hull Structure Committee — chairman, **Thomas M. Buermann,** vice president, naval architecture, Gibbs & Cox, Inc., New York, N.Y.

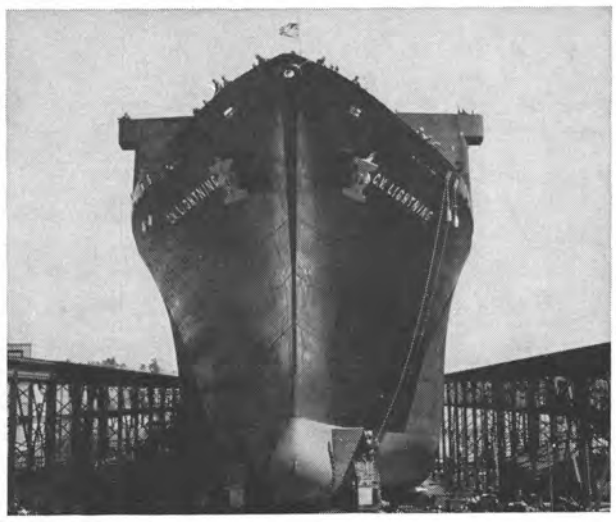
Ships' Machinery Committee — chairman, **John T. Tompkins Jr.,** engineer-machinery design, Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

Ship Technical Operations Committee—chairman, Capt. **Theodore J. Banvard,** USN, Engineering Officer, Military Sealift Command, Washington, D.C.

Marine Systems Committee — chairman, Capt. **Richard T. Miller,** USN (ret.), manager, hydrodynamic and mechanical systems, Engineering Underseas Division, Ocean Research, Westinghouse Electric Corporation, Annapolis, Md.

T & R Fund Raising Activity—chairman, **Stuart W. Thayer,** vice president, Lykes Bros. Steamship Co., Inc., New Orleans, La.

Maintenance is expensive. Protect steel with INTER-ZINC®



C. V. LIGHTNING on the ways at builders, Bath Iron Works Corp., Bath, Maine. All exteriors of this huge container vessel and her two sister ships are protected with INTERNATIONAL coatings featuring "INTER-ZINC" above the waterline and High Build Silver PRIMOCON® below. Owners are American Export Isbrandtsen Lines, Inc. of New York.

Proper protection means more profit, a better finished product, greater customer satisfaction. Metallurgists are constantly improving the quality of steel. And, the chemists at International Paint, the world's largest marine paint company, are constantly seeking new coatings that protect longer and are more efficient in use.

"INTER-ZINC" is an inorganic zinc silicate coating designed for greater protection of steel surfaces. It is extremely corrosion resistant. Its high metallic zinc content provides exceptional cathodic protection to exposed steel in abraded areas.

"INTER-ZINC" requires no special curing solution for hardening. It is self curing. It can be applied at temperatures as low as 0°F or up to 95% relative humidity with no effect on the cure. It can be subjected to extreme changes in atmosphere 20 minutes after application. "INTER-ZINC" provides superior durability resistance to "rust creep" and has remarkable abrasion resistance when cured.

One coat of "INTER-ZINC" protects steel structures. In marine use, it is unparallelled as a primer for other coatings such as INTERGARD® Epoxies, on ships' hulls, superstructures or off-shore drilling platforms, barges and steel piers.

"INTER-ZINC" is specifically formulated for simple overcoating. Overcoat "INTER-ZINC" with any "INTERGARD" Two Package Epoxy. Overcoat "INTER-ZINC" with "INTERGARD" 4437 for interim contamination protection and/or for subsequent top coats of conventional International Alkyds, "INTERGARD" Epoxies, and any other type International heavy duty paints.

Today is an age of specialization. Consult specialists for complete corrosion protection in any type of environment. Remember International Paint products are the result of the most advanced technology in research, development and manufacture of coatings for heavy duty service. Their long, trouble-free life on the job makes them economical beyond compare. We invite you to consult us on your next job, without obligation.

"INTER-ZINC" Shop Primer is also available featuring all of the usual attractions of zinc rich Shop Primers such as weldability, durability, etc. Consult us for details on "INTER-ZINC" Shop Primer.

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WORLD'S LARGEST MARINE PAINT MAKERS

First U.S. Offshore Deep Draft Terminal Planned For Delaware Bay

An artist's rendering of the proposed Delaware Transfer Terminal.

Zapata Norness Incorporated has announced that it has completed the preliminary design, engineering and environmental studies necessary to develop the nation's first deepwater offshore bulk materials terminal in Delaware Bay to handle export coal and ultimately receive foreign iron ore.

Zapata, an international bulk shipping, marine service and natural resources firm, has formed a subsidiary, Zapata Bulk Systems, Inc., to build and operate a proposed $160-million terminal about three to four miles offshore the lower middle Delaware Bay off the mouth of the Mispillion River, subject to the approval of the Delaware Legislature. Zapata indicated the first stage of the terminal operation would handle only coal. Plans call for an initial capacity of about 20-million tons annually. Incoming iron ore shipments would begin in the late 1970s, and no oil would be handled at the proposed terminal, the company said.

Michael R. Naess, a Zapata executive vice president and president of Zapata Bulk Systems, said that a preliminary study of the environmental aspects of the terminal in relation to the Delaware Bay area had been made by Arthur D. Little, Inc., of Cambridge, Mass.

Mr. **Naess** said that in 1974 there will be an international fleet of about 700 ships in service exceeding 100,000 deadweight tons which will be unable to arrive or depart fully loaded from any existing East Coast-Gulf Coast port. More than 375 of the 700 vessels will be in excess of 200,000 deadweight tons, he said, pointing out that "it is inconceivable that the United States should not participate in this developing ocean transportation revolution, since the very competitive position of the United States is at stake."

The Delaware Bay site was selected, Mr. **Naess** said, because the area is the only location on the East Coast of the United States in close proximity to the mid-Atlantic industrial area which has a natural deepwater channel. With a minimum of dredging, this channel can be deepened sufficiently (to about 72 feet) to handle the super bulk carriers of 200,000 to 250,000 deadweight tons, which will be the backbone of the world's fleet in the '70s and '80s, and which are needed to reduce the transportation costs of coal and iron ore, he said.

The terminal would be located on a 300-acre island composed of material dredged from Delaware Bay. The coal would be barged north 160 miles to the proposed terminal from Hampton Roads, Va., where it would be loaded on oceangoing carriers for delivery to foreign markets. Plans call for maintaining a 40,000-ton self-unloading barge at the coal railyard docks at all times to speed the unloading and reutilization of the coal hopper cars, which now must wait in a storage capacity for ships to pick up the coal for foreign distribution.

The increased utilization of the hopper cars would speed up coal deliveries to domestic power generating plants and help to relieve a domestic coal and power shortage, while giving rise to important cost reductions in transporting coal to loading ports.

Major importers of U.S. coal are Japan, Italy, France, Spain, Brazil, and Holland. It is planned that the "backhaul" of the super carriers would be iron ore from Brazil, Liberia, Australia, Mozambique, and South Africa.

Design project engineers for the terminal are Soros Associates of New York, who currently are engaged in the design and engineering of 11 of the approximately 20 deepwater port facilities around the world. Project managers for Zapata Bulk Systems are Purvin and Lee Associates, New York, consulting management engineers.

Stanley Powell Jr. Elected Director U.S. Leasing Int'l

Stanley Powell Jr.

Stanley Powell Jr., former president of Matson Navigation Company and Alexander & Baldwin, Inc., has been elected to the board of directors of United States Leasing International, Inc.

U.S. Leasing is the world's largest equipment leasing organization with annual sales in excess of $330 million. The company's Transportation Division serves shipping, railroad and airline companies, and arranged some $200 million of lease financings for transportation companies in 1970.

Brooks Walker Jr., U.S. Leasing chairman, said that Mr. **Powell's** election to the board is indicative of the company's growing involvement in the leasing of oceangoing vessels.

Mr. **Powell** is a member of the board of managers of the American Bureau of Shipping and is a commissioner on the U.S. Commission on American Shipbuilding. He served as president of Matson from 1962 through 1970.

New Panel Formed MarAd/Navy Personnel

A joint panel of personnel from the Maritime Administration and the Navy has been created to help assess U.S. shipyard capabilities.

Representing MarAd on the panel will be **Ludwig Hoffman,** Assistant Administrator for Operations; Rear Adm. **George H. Miller,** USN, Special Assistant to the Administrator, and Comdr. **Steven Lazarus,** USN, Director of the Office of Policy and Plans.

Representing the Navy on the panel are Rear Adm. **N. Sonenshein** USN, Commander, Naval Ship Systems Command; Rear Adm. **Richard E. Henning,** USN, NavShips Deputy Commander for Productions and Rear Adm. **John D. Chase,** USN, Deputy Commander, Military Sealift Command.

Key Appointments At Seatrain's Container Div.

Peter Vickers

John J. Haggerty

J. Carey

Seatrain Lines' Container Division has announced key marketing and operating executive appointments designed to further strengthen and broaden its top management.

William Cole, president of the division, advised of the appointments of **Peter Vickers** to director motor carrier and rail services, **John J. Haggerty** as general manager marketing, U.S.A., and **J. Carey** as director port and terminal operations. All three will report to newly-appointed executive vice president **Arthur C. Novacek,** formerly senior vice president of the division, and prior to joining Seatrain, president of Grace Lines.

Mr. **Vickers** was most recently general traffic manager of Atlantic Container Lines, where he was responsible for container equipment management and control, as well as documentation and booking. Mr. **Haggerty** was formerly general traffic manager of Prudential-Grace Lines, with heavy experience in marketing and traffic. Prior to joining Seatrain in mid-1970, Mr. **Carey** was division operating manager for Sea-Land's Alaska Division.

"These three experienced executives will assist Seatrain in its continued growth as a major worldwide container operator. Our organization must keep pace with the dynamic growth of our container operations," stated Mr. **Cole.**

Bank Of New Orleans Names Erik Johnsen

Erik F. Johnsen, president of Central Gulf Steamship Corporation, was named to the board of directors of The Bank of New Orleans and its parent company, New Orleans Bancshares, Inc. His election to the boards was announced by **Lawrence A. Merrigan,** president, following a meeting of the bank's directors.

Mr. **Johnsen** is first vice president of International House, a director of the New Orleans Steamship Association, vice president of the Greater New Orleans Council of the Navy League of the U.S. and a life member of the National Defense Transportation Association.

A native New Orleanian, Mr. **Johnsen** is a business administration graduate of Tulane University and a graduate of the U.S. Merchant Marine Academy, Kings Point, N.Y., where he was recently named a member of the advisory board. He is a director of Canal Barge Co., Inc., of New Orleans, a member of the board of governors of Tulane University Medical Center and a board member of Trinity Episcopal School.

Mr. **Johnsen** has long been active in promoting the maritime industry and in developing foreign trade and commerce through the port of New Orleans. Two of his company's ships, the Acadia Forest and the Atlantic Forest, are progenitors of the LASH (Lighter Aboard Ship) concept.

Dr. George A. Brown URI Professor To Head Maritime Committee

Dr. **George A. Brown** of the University of Rhode Island has been appointed director of the technologies panels of the technical committee on marine systems and technology of the American Institute of Aeronautics and Astronautics. Dr. **Brown,** a URI professor of ocean and mechanical engineering, is a vice chairman of the technical committee.

The institute, which is a professional society for aeronautical and aerospace engineers, recently formed the technical committee to concentrate on marine systems that relate to the aerospace industry, such as underwater and surface propulsion systems and hydrofoils.

In 1969 and 1970, Dr. **Brown** was chairman of the institute's former technical committee on hydro-propulsion.

Mobil Orders Two Additional Tankers From Sasebo Yards

Two additional supertankers will be built by Sasebo Heavy Industries Co. Ltd. at its shipyards in Japan, under contracts signed with a Mobil marine affiliate.

One vessel, at 211,000 dwt and to be delivered in 1973, will be a sister ship to the Mobil Pegasus and the Mobil Pinnacle, which are now in operation. The other, at 265,000 dwt and scheduled for delivery in 1974, will be the largest vessel in the company fleet.

The 265,000-ton vessel will be 1,115 feet long with a 175-foot beam. It will have a draft of 70 feet and an operating speed of 16 knots. The 211,000-ton tanker, like its sister ships, will be 1,070-feet long, with a beam of 158 feet. It will have a draft of 63 feet 5 inches and an operating speed of 16 knots.

Two other vessels, sister ships to the Pegasus and Pinnacle, are scheduled for delivery this year.

Like the other tankers built for Mobil companies by Sasebo, the new tankers will have double bottoms. This is a feature pioneered and patented by Mobil, and consists of a 10-foot space between the vessel's bottom hulls and cargo tanks. This reduces operating costs and provides an additional barrier between the crude oil and the sea if a vessel should run aground.

Puget Sound Tug And Barge Co. Acquires Arctic Marine Freighters

Puget Sound Tug and Barge Co., Seattle marine transportation firm which made maritime history with its operation and management of Arctic Marine Freighters' massive sea-lifts of cargo to Alaska's North Slope in 1969 and 1970, has now acquired AMF as a wholly-owned subsidiary.

Announcement of the acquisition, effective February 15, 1971, was made by **Leo L. Collar,** president, Puget Sound Tug and Barge Co., a Crowley-Red Stack enterprise. AMF previously had been a joint venture involving PST&B and PAC, and operated by Puget Sound Tug and Barge Co.

With the addition of AMF to the Red Stack fleet, Mr. **Collar** said, AMF is now moving ahead on planning and logistics for the 1971 haul of oil field and construction equipment from East, Gulf and Pacific ports to the oil-rich Alaskan port of Prudhoe Bay beyond the Arctic Circle.

"While Red Stack had provided the vast majority of management, operations, planning, sales services and personnel for AMF and over 70 percent of the marine and shoreside equipment necessary to prosecute the job in the previous North Slope hauls, full ownership of AMF will give Puget Sound Tug and Barge Co. even greater flexibility and capabilities in meeting the shippers' needs in 1971," he pointed out.

In anticipation of the acquisition, approximately $5,000,000 worth of equipment, including lighter tugs, barges, cranes, cargo handling gear and camp facilities for 100 men, was left intact on the North Slope at the end of last year's haul to give AMF a running start on the 1971 operation.

When AMF made its first "pilot" haul from Seattle to the Arctic area in 1968, it was the first time in history that tugs and barges carried commercial cargoes around Point Barrow.

In 1969, a full-scale operation with over 40 tugs and barges delivered 73,000 tons of dry cargo and 125,000 barrels of petroleum to the North Slope. In 1970, there were 80 tugs and barges in the flotilla which carried 187,000 tons of cargo into the Arctic.

The decision to go into the North Slope, Mr. **Collar** recalls, was definitely not a casual one. "The operation," he said, "involved a haul of more than 3,200 miles through some of the stormiest and most treacherous waters in the world. It was a gamble with totally unpredictable ice conditions. Getting around Point Barrow, northernmost point on the North American Continent, and into the Arctic areas east of there is a tricky operation. It can be done only during about six weeks in the summer. Ice blocks navigation the rest of the year. The fleet must move around Point Barrow when the ice floes recede, maybe for only a few hours.

"Even during the summer, the Arctic Ocean around Point Barrow is navigable only when there is a strong south wind. The wind sweeps the fragmented ice from shore, but it may not stay away for long. As soon as the wind stops, the ice may close in again and there is no escape until it opens once more. And after the brief six-week period, the ice comes back in and stays there until the following summer."

Mr. **Collar** pointed out that the same Red Stack professionals who planned, coordinated and executed the 1969 and 1970 operations would again be serving on the 1971 project. These include **Don McLean,** who was project manager; **Alan Watkins,** assistant project manager; **Harlan McDonnel,** beach operations manager; **Alan Steel,** offshore operations manager, and **Harold Huycke,** assistant offshore operations manager.

Equipment utilized included the Red Stack "super-barges," 400 by 100 feet, the largest flat-deck barges in the world, and new 7,000-hp tugs.

Once the tugs and barges have negotiated the hazardous waters around Point Barrow and are anchored at Prudhoe Bay, the men and equipment become involved in an around-the-clock unloading marathon against the weather, primitive conditions and the ever-shifting polar ice masses.

The waters of Prudhoe Bay are so shallow that the cargo must be transferred from oceangoing barges to lighter barges. There are no permanent port facilities at Prudhoe Bay, so the lighter barges must again be unloaded on a dock consisting of barges lashed together, floated into the beach, joined to an earth causeway and sunk in place by flooding of ballast tanks.

When the operation is in full swing, one observer wrote, "it looks like pictures of D-Day at Normandy. The only thing missing is the gunfire."

Puget Sound Tug and Barge Co. was formed in 1929 through the merger of four companies dating back to the turn of the century and at that time became affiliated with the Crowley-Red Stack fleet headquartered in San Francisco.

Among other affiliated companies are: Alaska Hydro-Train, which operates a "floating railroad" from the continental U.S. to points in Alaska and which inaugurated new services in 1970 in conjunction with Burlington Northern Railway over a new $1.5 million barge-loading facility in Seattle; North Star Forwarding, an ICC freight forwarding operations which provides service to 88 points in Western Alaska from Washington, Oregon and Idaho; United Transportation Co. and Bulk Petroleum Carriers, which constitute the only fleet of petroleum carriers operating simultaneously on all three coasts of the continental U.S.—Atlantic, Gulf, and Pacific.

Babcock & Wilcox Boilers Will Power Lykes Bros. Barge And Intermodal Ships

The first of two B&W boilers for the Doctor Lykes is moved into position for lifting aboard the vessel at the Quincy Division shipyard of General Dynamics in Quincy, Mass.

Specially designed Babcock & Wilcox boilers will power the Doctor Lykes, the first of a new type of commercial cargo vessel known as SEABEE ships. The Doctor Lykes and two sisterships are being built by General Dynamics at Quincy, Mass.

The ship will have a powerplant of 36,000 shp. The two B&W two-drum marine boilers are designed to fit the unusual hull of the ship. Each boiler will deliver 123,000 pounds per hour of steam at 865 psig and 955°F.

The Doctor Lykes and her sisterships will be equipped with Bailey Meter controls and Diamond Power soot blowers. Both companies are B&W subsidiaries.

Bethlehem To Build Two Drilling Platforms At Beaumont Yard

J.O. Crooke, general manager of Bethlehem Steel Corporation's Beaumont yard, reports the receipt of contracts for the construction of two mobile oil drilling platforms designed to operate in as much as 250 feet of water. Both drilling platforms are scheduled for delivery late this year.

One of the contracts is from the Marine Drilling Company of Corpus Christi, Texas, and the other from the Storm Drilling Company of Houston, Texas.

The Storm Drilling Company rig will be named Stormdrill VII. It is a diesel-electric unit. The rig for the Marine Drilling Company will be named J. Storm II. This is a mechanical unit and will have a twin-drive diesel propulsion-assist system. Both rigs will be built in compliance with the highest classifications of the American Bureau of Shipping.

Bethlehem's Beaumont yard has built all the mobile oil drilling platforms presently owned by both of the contracting companies. The six rigs previously built were designed to operate in water depths from 70 feet to 225 feet.

CANADIAN MARITIME SECTION MEETS: The Canadian Maritime Section of The Society of Naval Architects and Marine Engineers met on January 28. During the technical session, **S. Posner,** department of naval architecture and marine engineering, University of Michigan, presented a paper titled "A Brief Survey on Dredges." In the paper, the author gave a clear description of the different types of dredges, their functions, and some design problems. Upon Completion of the paper, a lively discussion period ensued between Mr. **Posner** and various members of the Society. Pictured at the head table, from left to right: Capt. **P. Brick,** C.S.S. Baffin; Lt. Comdr. **S. Farrel,** H.M.C.S. Skeena; **S. Posner,** guest speaker; **J. Shepherd,** Section chairman; **G. Smith,** Marine Superintendent, Department of Energy and Resources; **E. Hinze,** secretary treasurer of the Section, and Capt. **G. Wagner,** C.S.S. Hudson.

NKK New York Appoints Toshio Isago New General Manager

Toshio Isago

Toshio Isago has been appointed general manager of the New York office of NKK (Nippon Kokan) succeeding **Satoru Suzuki,** who has been named assistant to the president, Tokyo.

NKK is Japan's number two steelmaker and only integrated shipbuilder-steelmaker-fabricator. The company's fiscal 1969 sales (April 1, 1969 to March 31, 1970) surpassed $1.39 billion.

Mr. **Isago** has been special assistant to the president, Tokyo, since 1969. Prior to that time, he held executive positions in the company's Tokyo sales office, general planning and personnel departments, and in the production planning sections of NKK's Keihin Steel Works.

Mr. **Isago** joined the company in 1948, upon graduation from the University of Tokyo, Faculty of Law.

Todd-Houston Yard Lays Keel For Edison Storage Barge

The keel was laid recently at Todd Shipyards Corporation (Houston Division) for the fourth of four fuel storage barges being constructed for Consolidated Edison Company of New York, Inc.

The 250-foot by 44-foot by 14-foot six-inch single skin fuel storage barge will each have a 25,000 barrel capacity of No. 2 fuel oil. After completion they will be moored at Con-Edison's Gowanus substation in Brooklyn for fueling gas turbine powered generators.

The last two barges are scheduled for delivery in New York Harbor next month.

Montreal-Lake Ontario Section Of Seaway Shows Cargo Increase

Cargo moving through the Montreal-Lake Ontario section of the St. Lawrence Seaway increased nearly 25 percent in 1970, according to Secretary of Transportation **John A. Volpe.**

Final statistics for the year show that more than 51.1 million tons of goods passed through the section, an increase of 24.6 percent over the 1969 volume, Mr. **Volpe** said.

The studies were begun in October and are expected to last through the 1970-71 shipping season.

OSE Appoints Gorton To Head Ocean Dredging, Inc.

Willard Bascom, chairman of Ocean Science and Engineering, Inc., Washington, D.C., has announced the appointment of **M.S. (Mark) Gorton** as general manager of Ocean Dredging, Inc. of Fort Pierce, Fla.

Mr. **Gorton** has managed some $25 million of successful dredging jobs in the northwest United States, Alaska, Kwagalein, and has consulted on various foreign jobs. He will be responsible for the operation of Ocean Dredging's underwater dredge, and of new dredges now being planned. Ocean Dredging, Inc. specializes in beach restoration projects in which new sand is added to eroded beaches from sources offshore beneath rough water.

Mr. **Gorton** has spent over 20 years in the dredging business as designer, engineer, and operations manager of various dredging and marine construction companies. He is a graduate of the University of Washington in civil engineering, and a registered professional engineer in the state of Washington.

Ocean Science and Engineering, Inc., is a diversified corporation headquartered in Washington, D.C., and has facilities in California, Florida and Texas.

1970: A Busy Year For Terrin-Marseille Ship Repair Div.

Societe Provencale des Ateliers Terrin, Marseille, has reported several changes in management and a start in the move of production capacity from the existing main location to a site near the large drydocks.

The board of directors appointed **Pierre Terrin** as president-directeur general. **Louis-Michel Poncet** and **Francis Rudondy** were appointed as his assistants, **Paul Muletier** became manager of the Paris office and **Jean-Pierre Terrin,** commercial manager of the company. **Jacques Pointud** became production manager.

Maurice Terrin, who is president-directeur general of Sud-Marine is a director of Societe Provencale des Ateliers Terrin. Sud-Marine, a firm belonging to the Terrin Group, is France's foremost company in the specialized field of repair and maintenance of diesel engines, turbo-blowers and gas turbines. The firm had a successful year with a satisfactory volume of marine business and a steady development of its activity on land installations.

As a result of the ever-growing size and number of vessels requiring repairs, Terrin Marseille's development plans have included for some time a redeployment of production installations from Chemin de la Madrague-Ville to the Mourepiane area near numbers 8 and 9 drydocks, close to the zone earmarked for the future 1,181-foot by 213-foot floating dock. Phase I of the plan was begun in November and the piping, plate and electricity/electronics shops are now in operation.

During 1970, Terrin Marseille worked on 577 vessels. Of these, 170 were repaired in drydock, and 349 were the subject of voyage repairs.

Babcock & Wilcox Names Taber To Head Power Generation Div.

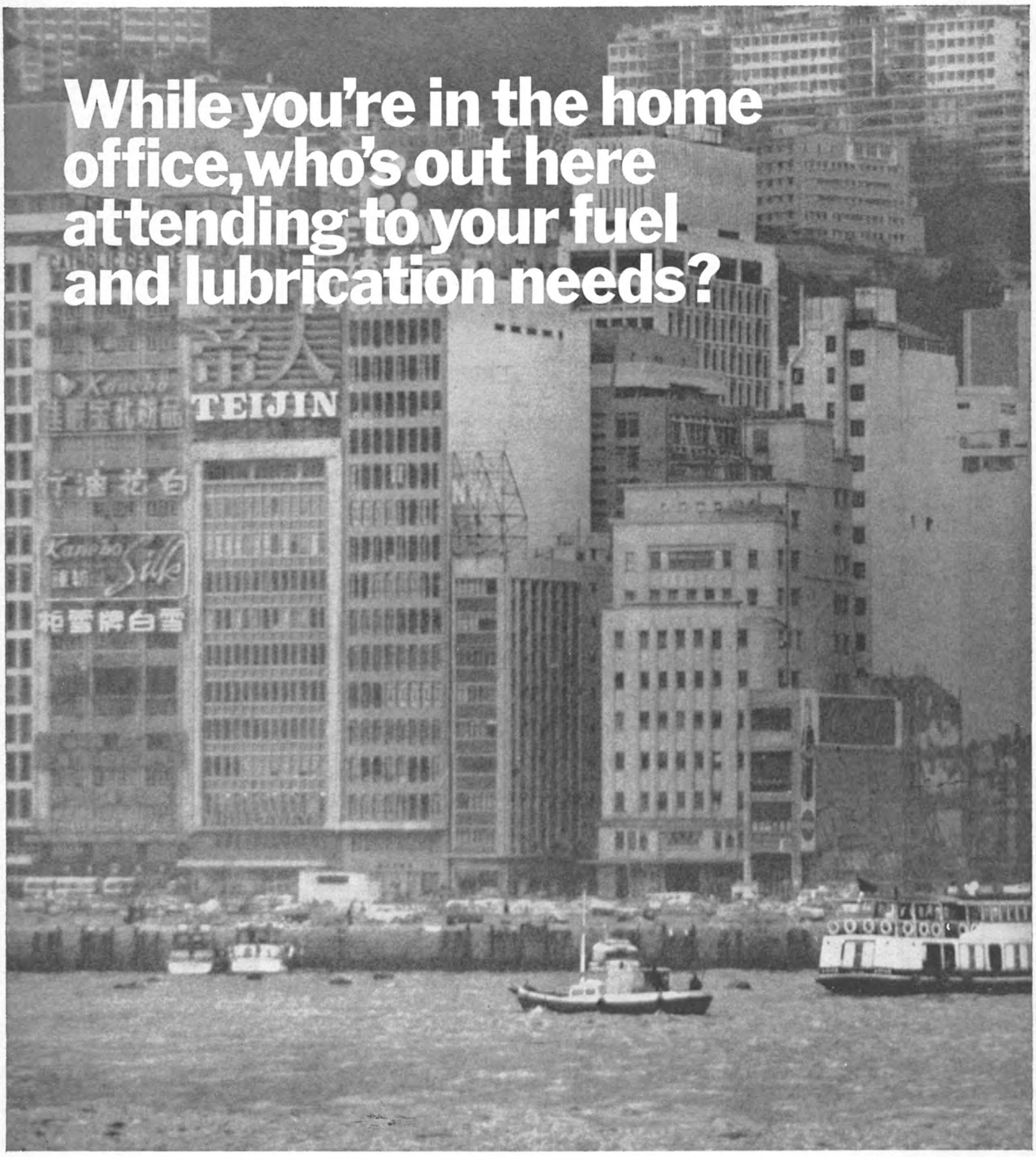
A.P. Taber

A.P. Taber, vice president of Babcock & Wilcox, has been named to head the company's Power Generation Division, it was announced by **George C. Zipf,** B&W president. Mr. **Taber** succeeds **Ellis T. Cox** who has resigned.

A retired Army brigadier general, Mr. **Taber** joined B&W in 1959 after two years as professor of metallurgical engineering at Syracuse University. After serving on the president's staff, he was elected vice president in 1960, and named head of the company's Research & Development Division. In this post, Mr. **Taber** organized and staffed the operations research effort for the company. He also headed a department for corporate marketing and new product development, and served as deputy to Mr. **Zipf** in various corporate-level assignments. During his career with B&W, Mr. **Taber** has been involved in all aspects of B&W's power generation activity, including fossil, as well as nuclear.

During his military career, all in ordnance, Mr. **Taber** served as Commander of the Watertown, Mass. Arsenal, a heavy artillery manufacturing facility. Prior to retirement, he was Deputy Commander of the Aberdeen, Md. Proving Grounds. He is a graduate of the U.S. Military Academy and has an M.S. degree in mechanical engineering from the Massachusetts Institute of Technology.

Mr. **Taber** is a fellow of the American Association for the Advancement of Science and serves as committeeman-at-large for the industrial science section. He is a member of the American Society of Mechanical Engineers, the American Society for Metals, American Ordnance Association, and Newcomen Society of North America.



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Treatment System Installed Aboard Texas A&M Training Ship

Texas A&M University's Texas Maritime Academy, College Station, Texas 77843, has installed a sewage waste treatment system aboard its training ship, Texas Clipper, eliminating the dumping of raw sewage in harbors and at sea.

The 15,000-ton vessel is one of a small number of ships in the world with a waste water system, noted Adm. **James D. Craik,** TMA superintendent. Admiral **Craik** said the system meets all existing Federal and state water pollution requirements.

The Texas Clipper project has led to a proposed research program for merchant vessels in general.

The ship is berthed at Texas A&M's new Mitchell Campus on Pelican Island in Galveston. It serves as a dormitory and dining hall for TMA cadets during the regular school year, in addition to being used for summer training cruises to Europe and other parts of the world each summer.

Admiral **Craik** said the $100,000 fresh water system includes one 3,000-gallon pre-treatment tank, one 7,500-gallon final treatment tank, one 15,000-gallon holding tank and two multipurpose transfer pumps.

Pipes and pumps have been cross-connected to provide researchers with the capability to either induce chemicals or transfer wastes for further treatment, Admiral **Craik** explained. The system is designed for 250 men at 30 gallons per day treatment for each man. The admiral said the five-stage treatment cycle produces a high quality, clear and odorless effluent.

Design engineering was produced by the Galveston naval architectural firm of Designers and Planners, a subsidiary of Todd's Shipyards Corp., with installation by McDonough Iron Works, Galveston. The 15,000-gallon holding tank and two pumps were provided by Todd Shipyards Corp., Galveston Division.

Bio-Pure, Inc., of Tualatin, Ore., produced the treatment equipment.

The system was installed without using state-appropriated or Federal funds, Admiral **Craik** emphasized.

TMA has 82 sophomore, junior and senior cadets enrolled at the Galveston campus. Freshmen are enrolled at Texas A&M's College Station campus.

The Texas Clipper is used to train the students in practical aspects of their education, leading to licenses as merchant marine officers and Naval Reserve officers.

Capt. **Alfred Philbrick,** TMA executive officer, pointed out there is little information available on treatment units for existing ships, and new merchant vessels only have holding tanks that are flushed at sea. He has proposed a research program to the Federal Water Pollution Control Administration which would utilize the Bio-Pure system on the Texas Clipper.

One of the research projects is the feasibility of utilizing harbor water with the ship's waste, treating and discharging an effluent into the harbor that represents considerable improvement over the original. Another consideration would be a system which could operate on harbor or sea water, since fresh water systems are not realistic on merchant ships at sea. He also suggested the testing of harbor water in world ports to determine its effect on shipboard waste systems.

Captain **Philbrick** said the end result could not only be pollution-free waste from the ship, but also the treatment of polluted water from the harbor.

Raytheon Offers New Twenty-Page Brochure

Thirty-one marine electronic aids for navigation, communications and safety are pictured and described in a new 20-page color brochure offered by Raytheon Company Marine Products, 676 Island Pond Road, Manchester, N.H. 03103.

Raytheon's full line of products for pleasure boats and small commercial vessels includes indicating and recording Fathometer depth sounders; radars; VHF/FM single sideband, citizens band, and AM radiotelephones; direction finders; loran receivers; loud hailers and accessories.

Ryan To Manage Raytheon Company Manchester Facility

Raymond J. Ryan

Raymond J. Ryan has been named manager of Raytheon Company's Manchester, N.H., operation. The operation is an integrated facility, engineering, manufacturing and marketing a full line of marine electronic equipment, ultrasonic measuring systems, precision welding equipment, ultrasonic machine tools, and Sorensen power supplies. Mr. **Ryan** succeeds **Ralph M. Moschella** who served as operation manager during the plant's construction and fitting out.

For the past three years, Mr. **Ryan** has been manufacturing manager at Raytheon's Equipment Division plant at Waltham, Mass., where he directed the manufacture of the guidance and navigation computers for the Apollo space program and the manufacture of guidance computers for the Polaris missile system. He joined Raytheon in 1959 as an engineer, advancing to senior engineer and to supervisory positions in manufacturing.

Mr. **Ryan** received his bachelor's degree in electrical engineering from Indiana Institute of Technology in 1958. He is a graduate of Raytheon's Advanced Management Program.

Hitachi Reveals Turbine And Boiler Program

Hitachi Zosen, with head offices in Osaka, Japan, has announced the establishment of a joint program with Kawasaki Heavy Industries, Ltd. for the manufacture of marine steam propulsion equipment, including marine steam turbines and marine steam boilers, all of fully-domestic design. This program has been set up to meet the need for increasing the output of the propulsion machinery in response to the trend for ships to become larger in size.

The first marine steam turbine unit to be manufactured under this program has been completed at the Sakurajima works. This unit is of the UA-360 type, with a maximum output of 36,000 shp on one shaft. It is to be installed on a 226,300-dwt tanker under construction at Sakai Shipyard for Regent Shipping Co., Liberia. The UA-360 unit consists of a cross compound impulse turbine with double reduction gears; it has a normal output of 35,000 shp (maximum of 36,000 shp) and is said to be the largest in commercial operation. The weight of the unit is 300 tons and it occupies a space about 36 feet long by 39.3 feet wide by 29.5 feet high.

Three types of steam turbine propulsion units have been developed. They have been designated UA, UB, and UR and range in output from 16,000 shp to 50,000 shp.

The first two steam generators to be manufactured under the program have also been completed. They are also of fully domestic design and are to be installed in the Regent Shipping Co. tanker to provide steam for the UA-360 steam turbine propulsion unit. These two boilers are of the two drum, water-tube type and were constructed at Innoshima Shipyard They are designated as BD type, and each has a normal evaporation rate of about 121,000 pounds per hour (maximum evaporation rate of about 158,400 pounds per hour) with a weight of 132 tons.

The present manufacturing schedule calls for 3 additional turbine units and 6 additional boilers in 1971, 6 turbine units and 12 boilers in 1972, and 8 turbine units and 16 boilers in 1973.

Hitachi Zosen also manufactures the Hitachi B&W diesel engine and has an aggregate production record of 4-million bhp from 1950, when the licensing agreement was concluded with the Burmeister & Wain Co., through December 1970.

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TURBO GENERATOR SETS

1

WESTINGHOUSE 440/3/60 200 KW UNIT

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.

2

700 KW NON-CONDENSING MARINE TURBO GENERATOR SET

TURBINE: DRV-318-MRI — 850# — 850°TT — 24 pounds back pressure—10938 RPM. GEAR—Type S—432 — 10932/1200 RPM. GENERATOR: 700 KW — 440/3/60—1200 RPM.

3

75 KW 120 VDC GENERAL ELECTRIC TURBO GENERATOR SET

TURBINE: 225 lb W.P.—150° superheat—15 lbs back pressure—4962 RPM. GEAR—4962—1800 RPM. GENERATOR: compound—75 KW—120 VDC—651 amps—1800 RPM.

4

WESTINGHOUSE 60 KW 120 VDC M-20-EH

120 VDC—1800 RPM. TURBINE: M-20-EH—20 lbs—dry & saturated—25" vacuum. 7283 RPM. GEAR: 7283/1800. GENERATOR: 60 KW—120 VDC—500 amps—SK—stab. shunt wound.

5

300 KW WORTHINGTON-MOORE CROCKER-WHEELER UNITS

AP2 Ex-Medina Victory units. Worthington-Moore turbine—440 lbs—740°TT—28½" vac.—type S4—5-stage—6097 RPM—serial 7547 & 7548. GEAR: 14x7—6097/1200. GENERATOR: Crocker-Wheeler 300 KW 120/240 DC—1250 amps—type 102-H—compound—973643—999759—armature flange 8¼"—bolt circle 7"—12 holes. Also new armature in stock (weighs 1840 lbs). Also have 2 units—generator 102 HP—300 KW—120/240—stab. shunt—1200 RPM.

6

VICTORY 300 KW WESTINGHOUSE TURBO GENERATOR SET

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.

7

1000 KW G.E. TURBO GENERATOR—READY TO GO—WITH A.B.S.

TURBINE: Type FSN—eight stage—9268 RPM—525 lbs—825°TT or 590 PSI & 0° superheat. Turbine serial No. 53729. GEAR: Serial 54804—9268/3600. GENERATOR: Serial 5596572—1000 KW—450 volt 3-phase 60 cycle—3600 RPM—0.8 PF—type ATB—2-pole—complete with air cooler. EXCITER: EDF — 10.2 KW — 120 volts—4-pole — 3600 RPM—direct connected. UNIT JUST COMPLETELY OVERHAULED & IN EXCELLENT CONDITION—READY TO INSTALL.

DIESEL GENERATOR SETS

8

G.M. 6-71 DIESEL GENERATOR SET

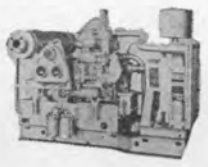
60 KW — 440/3/60 — 1200 RPM—with switchgear.

9

350 KW 120/240 VDC DIESEL GENERATOR SET

Ingersoll-Rand—heavy duty type S engine—8 cyl.—505 HP—10½ x 12. GENERATOR: G.E. 350 KW—120/240—600 RPM—switchgear. Good condition—as removed from Grace Line ships.

10



NEW—UNUSED 10 KW SUPERIOR GAB-2 DIESEL GEN.

4½ x 5¾—BHP 16—RPM 1200—radiator cooled. GENERATOR: Delco 10 KW 120 VDC—83.3 amps—75" OAL—57" OAW—57" OAH.

$1695.

TURBINE ROTORS

MAIN PROPULSION

11

19 STAGE WESTINGHOUSE H.P. ROTOR FOR AP2 VICTORY

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

12

SPECIAL!

ATTENTION—OWNERS OF SUN-BUILT C-4 HULLS

GE LP ROTOR—77943 GE HP ROTOR—77942
These rotors will interchange on all Sun C-4 vessels.
G.E.I. 16263

13

8500 H.P. G.E. — C-3 OR VICTORY
H.P.—8-stage—6159 RPM—serial 62043
L.P.—8-stage—3509 RPM—serial 62042
G.E.I. 16263

14

6000 H.P. G.E. — NORTH CAROLINA C-2
H.P.—8-stage—serial 78040
L.P.—7-stage—serial 78043
G.E.I. 16262

15

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

16

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.

17

300 KW 5965 RPM JOSHUA HENDY

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

T-2 ROTORS, STATORS COOLERS, ETC.

18

ELLIOTT 10-STAGE MAIN PROPULSION TURBINE ROTOR

#28702—Ex-Texas Trader—will interchange with large G.E. 1st Row—1 1/8" to shroud—1 3/16" O.A.H. 2nd Row—1 7/16" to shroud—1 9/16" O.A.H.

19

LARGE G.E. MAIN PROPULSION SCHENECTADY TURBINE ROTOR

Turbine serial 77418—reconditioned with certificate. Just out of Beth shop 1970.

20

AUXILIARY GENERATOR ROTORS

DORV—325M—T-2 Tanker Aux. Generator.

21

WESTINGHOUSE MAIN PROPULSION REVOLVING FIELD

Ex-Ohio Sun—A.B.S.—ready to go. Serial 25R10

22

WESTINGHOUSE MAIN GENERATOR STATOR

A.B.S.—ready to go—certificate 70BA5297 — May 19, 1970—Rewound.

23

G.E. MAIN GENERATOR STATOR

A.B.S.—ready to go—mfg. by Elliott for G.E.—over G.E. design.

24

WESTINGHOUSE MAIN GENERATOR AIR COOLER

Reconditioned with A.B.S.

25

UNUSED G.E. MAIN GENERATOR AIR COOLER

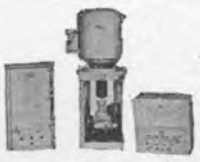
PUMPS

26

VICTORY AP2 MAIN CIRCULATOR

Ingersoll-Rand — 18 VCM—20" x 18"—10,500—10 lbs. MOTOR: 75 HP—Allis-Chalmers—230 VDC—670 RPM. Spare unused armature. Motor frame F.B.V.—162.

27



NEW BLACKMER FUEL OIL TRANSFER PUMP

Rotary—50 GPM—50 lbs.—2"—5 HP—440/3/60—with starter & spares.

28

UNUSED BLACKMER VERTICAL ROTARY PUMP

4"—100 GPM—100 PSI—15 HP — 440/3/60 — gear head.

29

KINNEY MOLASSES PUMP

430/215 GPM—size 8x8—pressure 60 lbs.—142/280 RPM. Motor RPM 875/1750. Falk 6.25:1 reducer. G.E. 30/15 HP motor.

30

R-2418 WATEROUS CARGO PUMP

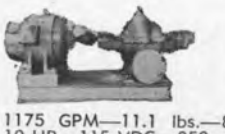
Bronze—14"—top discharge—capacity 2500 GPM—20 PSI. Bilge service—oil service—2400 GPM—75 PSI. Reduction gear. ENGINE: Cummins JN-130M—6 cylinder—4⅛ x 5—130 HP—air starting.

31

UNUSED BOILER FEED PUMP

Worthington Triplex—36.5 GPM—590 PSI—variable stroke—2¾ x 5—P_2—S_2—R_2 vessels. 40 HP—230 VDC—1800/2400 RPM.

32



UNUSED WARREN BRONZE PUMP

1175 GPM—11.1 lbs.—8" x 8". MOTOR: Reliance 10 HP—115 VDC—850—RPM—76 amps.

33

UNUSED SIZE 4 BUFFALO FEED PUMPS

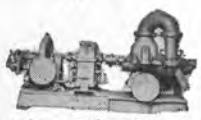
Terry Turbine—BM—273 HP—550 RPM—exhaust 15 lbs—590 PSI—superheat 0°—425 GPM Buffalo Pump—discharge pressure 750 lbs.—5" x 4"—built for USN DD destroyers.

34

COFFIN MODEL F BOILER FEED PUMP—VICTORY OR T2

Control valve 1¼"—Form V1—constant pressure regulator — type C — 150 HP—200 GPM at 575 lbs discharge pressure. 7200 RPM—440 PSI—500°TT.

35



2 BRONZE I.R. 10GT CARGO PUMPS—14x12

4400 GPM—280' head—3500 GPM—350' or 4000 barrels/hr. IR-10GT—14 x 12—1750 RPM—driven by Elliott 2DRY turbine—400 HP—400 PSIG—500° TT—10 lbs. back pressure—4550 RPM. Gear: 4550/1750. Good condition.

36

NEW WORTHINGTON VERTICAL SUBMERSIBLE BILGE PUMP

For emergency use on passenger ships, etc. PUMP: JAS—264 GPM—171' head—two 6" inlets—one 5" outlet. Motor: 40 HP—230 VDC—149 amps.

37

NEW—UNUSED BRONZE VERTICAL LST BALLAST PUMP

1500 GPM—56' head or 25 lbs. — 8" suction — 6" discharge. MOTOR: Century 30 HP—230 VDC—110 amps—1750 RPM — 40°T rise — stab. shunt—BB drip proof—controls available.

38

EXCELSIOR MOLASSES PUMP—SIZE 5½"

6" Suction and discharge—210 GPM—45 PSI—125 RPM. MOTOR: 10 HP—230 VDC—Frame 67—with gear.

39

BRONZE 14x14x12 CARGO STRIPPING PUMPS

700 GPM @ 100 lbs. Ex-T2 Tanker pump. Also available in steel.

40

T-2 TANKER BILGE, BALLAST AND FIRE PUMP

Bronze — 10x7x10 — vertical duplex. Steam pressure 150 lbs. gauge — exhaust pressure 10# gauge—discharge pressure 100# gauge—300 G.P.M.

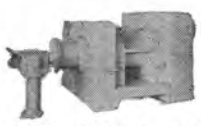
WINCHES AND WINDLASSES

41

AH&D SINGLE SPEED WINCHES

7250 lbs. @ 220 FPM—50 HP—230 VDC—with control. $1750 as is.

42



VICTORY UNIT WINCHES

50 HP—230 VDC—U-1, U-2, U-4, U-5—reconditioned.

43

MODEL U-6 DOUBLE DRUM WINCHES WITH GYPSIES

50 HP—230 VDC—reconditioned.

44

WATERMAN STEAM DECK WINCH COMPOUND GEARED

Compound-geared "Valle Type"—9½ x 10. 7000 lbs.—185 FPM—single geared. 12,800 lbs. 101 FPM—compound geared.

45

WATERMAN STEAM DECK WINCH—SINGLE GEARED

Single-geared "Valle Type"—9½ x 10—10,720 lbs. @ 238 F.P.M.

46

HYDE NO. 7 WINDLASS

1¾" Chain—Wildcat centers 3'3"—Handles 3000 lb. anchors. MOTOR: 8.7/35 HP—440/3/60—1800/450 RPM.

47

NEW—UNUSED LINK BELT WINDLASS

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

48

IDEAL WINDLASS—UNUSED

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

49

UNUSED 70 HP McKIERNAN-TERRY WINDLASSES

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.

50

3-TON CLYDE DOUBLE DRUM WINCH

3-Ton double drum winch—10 HP—115 VDC—declutchable drums—with controls. Drum is 16" in diameter and 28" wide. Winch OAW 10'2"—OAL 8'1".

MISCELLANEOUS

51

UNUSED DOCK CAPSTAN

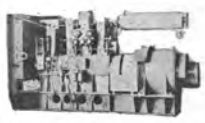
15 HP—220/440/3/60—3000 lbs @ 100 FPM. Gypsy 8"—waterproof box—floorplate.

52

HYDE 30" DOCK CAPSTAN

10" x 10"—reversible—W.P. 125 lbs—2½" steam—3" exhaust.

53



LORIMER 75 KW 120/240 D.C. DIESEL GENERATOR SET

Lorimer engine FN—5 cylinder—7.5 bore—9.5 stroke—720 RPM—radiator cooled. GENERATOR: Ideal type DD—75 KW—120/240 VDC—720 RPM—313 amps—frame 350-27. CAN ALSO OFFER SAME GENERATOR WITH 75 KW 440/120/3/60 A.C. Emergency sets from T-2 tankers.

54

DOUBLE INPUT—SINGLE OUTPUT DIESEL REDUCTION GEARS

Farrell-Birmingham—3200 SHP. Reduction gear: 1.81:1—handles two 1600 HP diesels @ 720 RPM. With hydraulic couplings & Fawick clutch. Port and starboard.

55

VICTORY AP2—WESTINGHOUSE MAIN PROPULSION GEAR

6000 SHP—Serial 4A-1620—Medina Victory.

56

INGERSOLL-RAND MODEL 40 AIR COMPRESSOR

Two stage—135 CFM—7" x 6¼" x 5"—110 lbs.—870 RPM—inner cooler. MOTOR: Allis-Chalmers 40 HP — 230 VDC — 145 amps — 1750 RPM — Model EB121.

57

GRISCOM-RUSSEL EVAPORATOR

12,000 evap.—230 VDC pumps or 440 A.C. pumps. Complete with Weir automatic water valve.

58

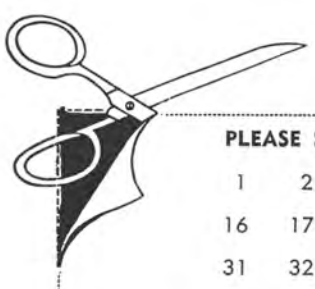
UNUSED 1135 SQ. FT. C.H. WHEELER CONDENSER

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

59

1 PAIR OF 300 HP UNION DIESEL ENGINES

Port and starboard—model 06—300 HP at 350 RPM—4 cycle—direct reversible—11 x 15—overhauled 1966—in good condition. Just in from Navy.



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NAME..... COMPANY.....

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

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

ARCTEC Participates In Icebreaking Tests

ARCTEC, Incorporated, Bowie, Md. 20715, a firm specializing in cold regions transportation technology, and Teledyne Materials Research have been awarded a contract by the U.S. Coast Guard to perform a full scale evaluation of the icebreaking qualities of the Coast Guard's lake icebreaker Mackinaw this winter.

Rod Edwards Jr., research vice president of ARCTEC, Incorporated and technical director for the Mackinaw tests, said that the full scale experiments aboard the USCGC Mackinaw will be designed to determine the resistance of the triple-screw icebreaker in ice and the structural loads on the hull which arise during operations in ice. Mr. **Edwards** explained that one of the most important results of the study would be a quantitative evaluation of the effectiveness of the Mackinaw's bow propeller in improving the icebreaking efficiency of the ship.

The USCGC Mackinaw has been equipped by Teledyne, ARCTEC, and the U.S. Coast Guard's Office of Research and Development with an instrumentation system which will measure and record the thrust, torque, and rpm of all three propeller shafts, the ship's speed relative to the ice, hull motions, and the strains in a portion of the bow structure estimated by ARCTEC's engineers to be the location of the highest expected ice loads.

The Mackinaw evaluation project is part of a program which has been undertaken by the Department of Transportation and other Government agencies to determine the technical and economic feasibility of extended and all-season navigation on the Great Lakes.

Dravo Corp. Appoints Niland B. Mortimer

Niland B. Mortimer

Niland B. Mortimer has been named manager of marine and systems sales for the Engineering Works Division of Dravo Corporation, Pittsburgh, Pa. Mr. **Mortimer** will be responsible for sales of all marine equipment and all systems involving bulk materials handling equipment such as unloaders, stacker/reclaimers, stackers and loaders.

A graduate of the University of Pittsburgh, Mr. **Mortimer** holds a B.S. degree in mechanical engineering. He joined Dravo in 1955 as a design engineer, and most recently served as manager of marine sales. Mr. **Mortimer** is registered as a professional engineer in Pennsylvania.

Dravo's Engineering Works Division designs and builds inland and coastal waterway marine equipment, heavy bulk materials handling equipment, and other specialized heavy machinery and equipment.

Atlantic Companies Names George Jones Marine Secretary

George A. Jones has been named marine secretary of the Atlantic Companies (Atlantic Mutual Insurance Company and Centennial Insurance Company).

Prior to joining Atlantic's ocean cargo department in 1957, Mr. **Jones** had 10 years of insurance experience in England. He was named marine supervisor of the Companies' Philadelphia office in 1961. Mr. **Jones** was transferred to the home office in 1963, and was named an assistant secretary in 1966 and hull secretary in 1968.

The Atlantic Companies write virtually all lines of insurance except life, and have offices from coast to coast.

Willamette-Western Appoints J.G. Kaady Mgr. Of Purchasing

Jack G. Kaady has been appointed manager of purchasing for Willamette-Western Corporation, according to **A.A. Riedel,** president of the Portland-headquartered diversified service, marine and heavy construction company.

Since he joined the firm in September 1969, Mr. **Kaady** has served as administrative assistant to both the president and the vice president in charge of Willamette Hi-Grade Concrete Co., a Willamette-Western division.

Six years before he joined Willamette-Western, Mr. **Kaady** was assistant to the president of Ross Island Sand & Gravel Co. He had earlier been accountant for that firm one and a half years.

Mr. **Kaady** was in the U.S. Navy for four years. He attended the Supply Corps School in Athens, Ga., and became a supply officer. He saw both sea duty and service at the Naval Torpedo Station at Keyport, Wash. Mr. **Kaady** is a native of Portland, Ore. He is a 1958 graduate of the University of Oregon, with a major in accounting.

Willamette-Western Corporation is a diversified organization oriented to the construction industry. Among various subsidiaries and divisions are Western-Pacific Dredging Company, Western-Pacific Piledriving Co., Willamette Hi-Grade Concrete Co., and Willamette Tug & Barge Co. The firm has other offices in Seattle, Tacoma, and Pasco, Wash., as well as San Francisco and Los Angeles, Calif.

1970 Chartering Annual Ready For Distribution

The Chartering Annual for 1970, published by Maritime Research Inc., 11 Broadway, New York, N.Y., is available for distribution, the company announced.

The publication, which contains charts and a listing of various ships fixed throughout the year, is arranged by commodity, trade route, dates and rates. The book is obtainable through subscription only, at a cost of $25 per copy.

IHI Asks Permission To Build New Shipyard

IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.), the leading Japanese shipbuilder, has applied to the Japanese Ministry of Transport for permission for a new shipyard construction project.

The new shipyard, tentatively named IHI Chita Shipyard, will be constructed on approximately 8,250,000 square feet of reclaimed land in the Chita Peninsula, Aichi Prefecture, in southern Japan.

Upon receiving permission from the Ministry of Transport, construction work will begin, with completion scheduled for December 1973. Construction of the first ship will begin in September 1972, while construction of a building dock is in progress. The cost of the new shipyard will be approximately $61 million.

The shipyard will have a building dock approximately 2,650 feet long, 300 feet wide and 45 feet deep, with two 350-ton goliath cranes and two 30-ton jib cranes. The yard will build five ships of the 250,000-dwt class yearly.

For efficient and continuous shipbuilding, the dock will be divided in three portions, and a ship will be built at three stages—the stern at the first stage, the midsection at the second stage, and the stem at the third stage. All ship construction work from keel-laying to completion, including the outfitting work, will be conducted in the dock, and on leaving the dock, the ship will be able to undergo a trial run immediately.

Construction of the new shipyard was projected to cope with the recent increasing demand for large ships. When the new yard is completed, IHI will discontinue shipbuilding in its Nagoya Shipyard (maximum ship, 60,000 dwt) and ship its employees to the new yard. Labor-saving schemes will limit the number of employees at the new yard to 1,350. The Nagoya Shipyard will switch its production to machinery and steel structures.

Standardized Bulk Carriers To Be Built By IHI Subsidiary

IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.), the leading Japanese shipbuilder, has developed a new standardized 29,000-dwt bulk carrier shipform and recently begun sales.

It is IHI's third standardized mass-production shipform, following first the Freedom ship and second the Fortune ship.

The 29,000-dwt (or 18,500 gt) bulk carrier will have the following approximate measurements: length, 538 feet; breadth, 88 feet; depth, 48 feet, and draft, 35 feet. It will be equipped with an 11,550-bhp IHI-Sulzer 7RND68 type diesel engine developing a service speed of 15.5 knots.

The construction of the standardized bulk carriers will start from mid-1973 at the No. 2 berth of Usuki Iron Works Ltd., a subsidiary of IHI, with completion of four to five ships consecutively per year. IHI has already received an order for a 29,000-dwt ship of this type from Lasco Shipping Co. of the U.S.A. and is negotiating another order with a Hong Kong shipowner.

In the production of Freedom and Fortune vessels, IHI has to date received orders for 81 Freedoms, 50 of which have been delivered, and 23 Fortunes. Each of these figures is an unparalleled record in world shipbuilding circles for ships of the same type ordered from a single shipbuilder.

USCG Chief Scientist To Speak At Seminar

Dr. **Charles C. Bates,** Chief Scientist of the U.S. Coast Guard, will preside over the second session of the seminar on "Pollution and the Marine Industry," which will be held at the Rivergate in New Orleans, La. on April 1-3. The seminar, conducted by the International Association for Pollution Control, is being held during the Commercial Marine Industry Exposition. As Civilian Director of the Office of R&D, Dr. **Bates** has played a prominent part in directing the research and development of pollution instrumentation and control equipment by the U.S. Coast Guard.

Prior to joining the USCG, Dr. **Bates** was Chief Scientist of the U.S. Navy's Oceanographic Office and was the Coordinator of Environmental Systems for the Chief of Naval Operations. He has also served with the Department of Defense in the Advanced Research Projects Agency, and has received extensive field experience in the Gulf Coast area as a geophysicist with Standard Oil of New Jersey prior to joining Government service.

Thomas Sullivan, president of the International Association for Pollution Control, stated: "All of the major Federal agencies involved in pollution and the marine industry will participate in the April seminar, making it one of the major events of the year for the marine industry. This seminar is definitely the most significant activity in the pollution field ever undertaken by the marine community."

For further information contact **Thomas Sullivan,** IAPC, Suite 700, Booz-Allen Building, 4733 Bethesda Avenue, N.W., Washington, D.C. 20014.

Aracaju Offshore Find Brings More Tests

As the result of the new discovery well, seven miles off Aracaju, the capital of the Brazilian state of Sergipe, two more test wells were ordered drilled in mid-February.

The discovery well, known as Caioba No. 1, has been hailed as the most important discovery in over 20 years. Hopes have been raised that the new discovery may make Brazil self sufficient. Speculation has it that this well might have a potential of 400,000 barrels daily, which would be more than enough to end the need for imports.

Brazil imports most of its oil from the Middle East and some from Venezuela. Brazil produces about one-third of it crude oil consumption.

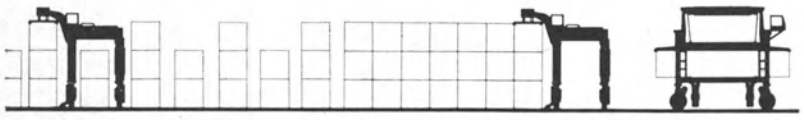
Now! A straddle carrier with side-loading capabilities

The Paceco-Belotti straddle carrier provides a new concept in container handling

Straddles a row of containers while loading another
Stacks containers flush or with aisleways
Stacks containers three high
Selectively loads and unloads railroad trains—gives 90° turning maneuverability.

Give us a call. A team of engineers is available for consultation concerning your container terminal system.

Paceco is the only manufacturer offering a complete selection of Container Handling Equipment, and world-wide manufacturing and service.



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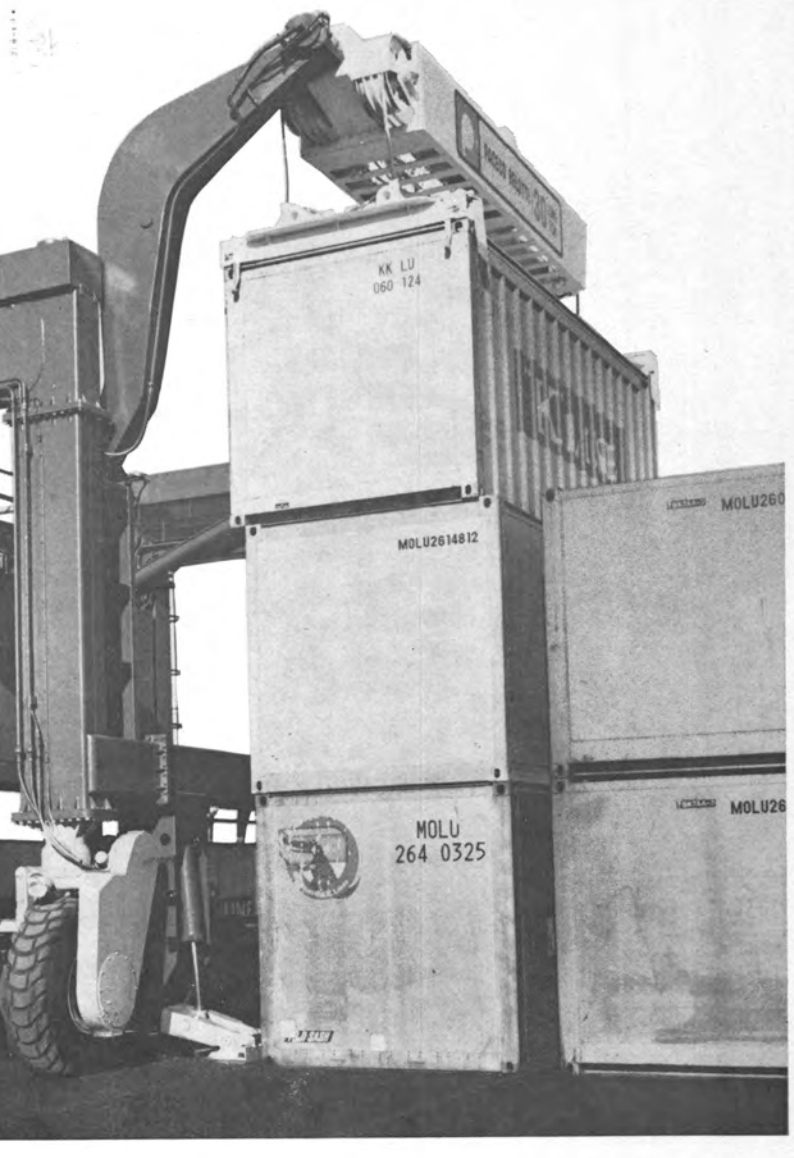

Standard Dredging Elects John Murray VP

John B. Murray, formerly vice president in charge of East Coast and foreign operations for Bauer Dredging Company, has been elected vice president for sales and engineering for Standard Dredging Corporation, New York, N.Y., according to **Lawrence Schacht,** president.

Mr. **Murray** had been associated with Standard Dredging for almost a quarter of a century as district manager in the Hawaiian Islands, and as vice president for foreign operations, before leaving the company in 1964 to go with Bauer.

Mr. **Murray** is a native of Pennsylvania and received his bachelor of science degree in civil engineering from Columbia University. He worked with General Motors for five years before joining Standard Dredging.

HITACHI'S STANDARDIZED 230,000 TONNER: The tanker Eiko Maru, built for Sanko Steamship Co., Ltd., was undocked recently from the 300,000-ton building dock at Hitachi Zosen's Sakai shipyard. This vessel is the first of a series of three standardized 230,000 tonners developed by Hitachi—one for domestic and two for foreign owners. The Eiko Maru, 1,050 feet by 167 feet by 85 feet, has an oil tank capacity of about 9,811,-994 cubic feet. Scheduled for completion near the end of next month, the tanker is powered by a Kawasaki steam turbine with a maximum output of 36,000 hp, accomplishing a speed of 16.7 knots during sea trials.

Bethlehem Steel Model To Be Displayed At Offshore Conference

A scale model depicting Bethlehem Steel Corporation's latest concepts in the design of mat-supported mobile oil drilling platforms will be displayed by the corporation at the 1971 Offshore Technology Conference, April 19-21 in Astrohall in Houston, Texas.

The model will portray a mat-supported platform capable of operating at depths of 250 feet of water. Two such rigs are under construction at Bethlehem's Beaumont, Texas, shipyard.

Other photographs, renderings and blueprints displayed by the firm will testify to Bethlehem's worldwide experience in design and construction of mobile platforms and other offshore drilling, production and storage equipment.

Highlighted will be the J.W. McLean, a self-elevating, mat-supported rig designed by Bethlehem and built by the corporation in the Far East Ship Building Industries yard in Singapore. Capable of drilling in 225 feet of water to depths of 25,000 feet, the McLean is the first rig of its type ever built in Southeast Asia. It is the second Bethlehem mat rig to operate in that area.

The firm's exhibit will also include photographs and brief descriptions of the Beaumont yard and its newest shipyard at Singapore. The Beaumont facility has for years been one of the world's leading designers and builders of mobile offshore drilling platforms.

The Singapore yard, in the heart of oil industry activity in Southeast Asia, was opened just recently. The yard is a joint venture of Bethlehem and Development Bank of Singapore. Incorporated as Bethlehem Singapore Private Limited, the yard has the capabilities to construct mobile drilling rigs, large barges and small coastal vessels.

Bethlehem's display will be located in Booths 3475 and 3477 in Astrohall.

All Seas Chartering Opens Tanker Firm

All Seas Chartering Inc., 80 Broad Street, New York City, has announced the opening of a new company called All Seas Tanker Chartering Inc., to be located at the same address. **Wolf Spille** has been named president of the new concern, which will be engaged in tanker brokerage and purchase and sales.

Mr. **Spille** has been associated with Naess Shipping for the past several years, and most recently was with Labash Inc., a tanker brokerage firm.

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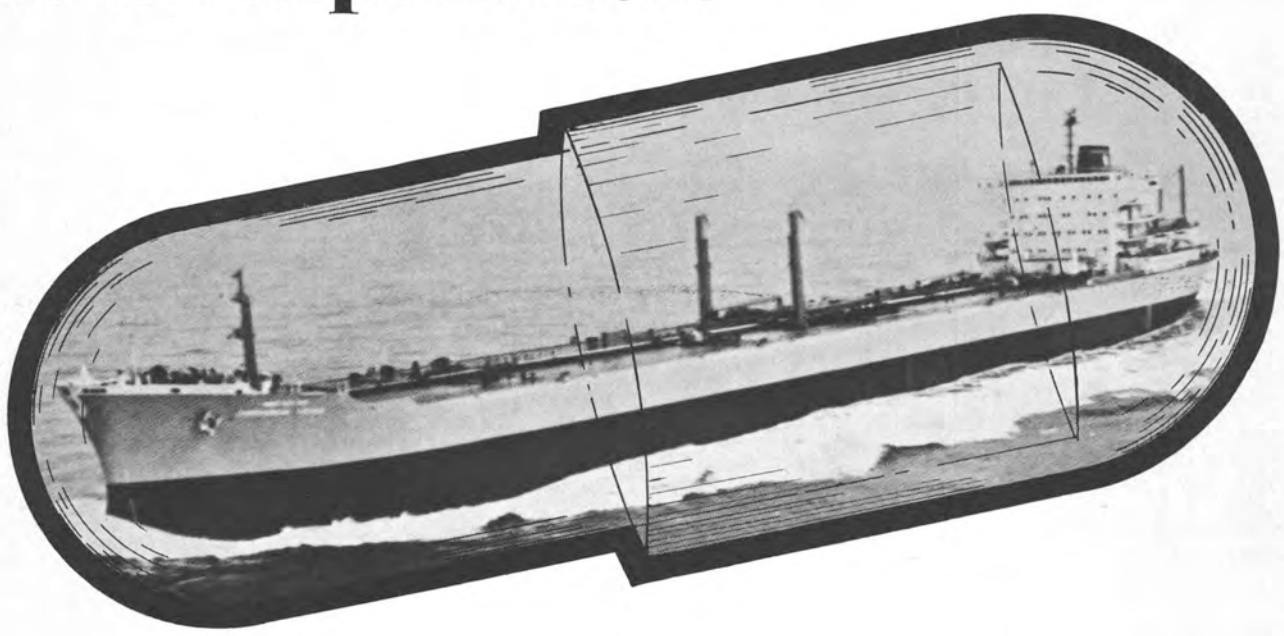

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R.L. Dibble And C.A. Lewis Appointed Vice Presidents AmShip Division, Lorain, Ohio

Robert L. Dibble

Clifford A. Lewis

George M. Steinbrenner III, chairman and chief executive officer of The American Ship Building Company, has announced the appointment of two new vice presidents for the expanding AmShip Division based in Lorain, Ohio.

Robert L. Dibble and **Clifford A. Lewis** are both being promoted from key executive positions in the company. Mr. **Dibble** has been director of personnel, and Mr. **Lewis** has been corporate insurance administrator. Mr. **Lewis** was the first quarterback of the original Cleveland Browns.

"Construction of the two new prototype self unloaders, which began last week, signals the start of considerable expansion and new employment opportunities in this division," said Mr. **Steinbrenner.** "We anticipate additional new vessel contracts in the near future which will assure continued growth and expanded activity for a long time to come. We are fortunate to have competent executives like Mr. **Dibble** and Mr. **Lewis** who are well-qualified to take on the increased responsibilities this expansion will require."

Dearing And Forsberg Named To New Positions In New York For Baltimore Copper Paint

Richard E. Dearing

R.M. Forsberg

Baltimore Copper Paint Division, Glidden-Durkee Division, SCM Corporation, has named **Richard E. Dearing** as head of the firm's New York office, charged with sales and service for the commercial marine trade. Mr. **Dearing** has been active in the marine coatings industry for the past 20 years. He is a past president of the New York Marine Sales Association.

The firm also announced the appointment of **R.M. Forsberg** to the New York office to assist with sales and service to commercial shipping customers. Mr. **Forsberg** joins Baltimore Copper Paint after having been associated with the Glidden Company in a sales supervisory capacity on special accounts in the Midwest. His previous activity had been in Glidden's Eastern Regional Office, Reading, Pa., in the trade sales and industrial marketing departments.

Baltimore Copper Paint's commercial marine sales in New York are handled through the office at 171 John Street. The main office and plant is located in Baltimore, Md.

Port Of Oakland Sponsors First West Coast Container Expo

The fourth International Shipping and Containerization Exposition and Congress will be held September 13-16 in Oakland, Calif. With a theme "Export '71," the exposition will take place in the arena and exhibition hall portions of the Oakland Coliseum.

Held in New York during the first three years of its existence, the event will be the first of its kind ever presented on the West Coast. It will be sponsored by the Port of Oakland, the second largest container port in the world.

The exposition and congress is designed to present the complete 1971 containerization picture, including a look at new material handling systems, demonstrations of new packaging methods, special application containers and other recent developments made in containerization by land, sea and air carriers.

Also featured will be demonstrations of freight handling equipment and container stuffing and stripping.

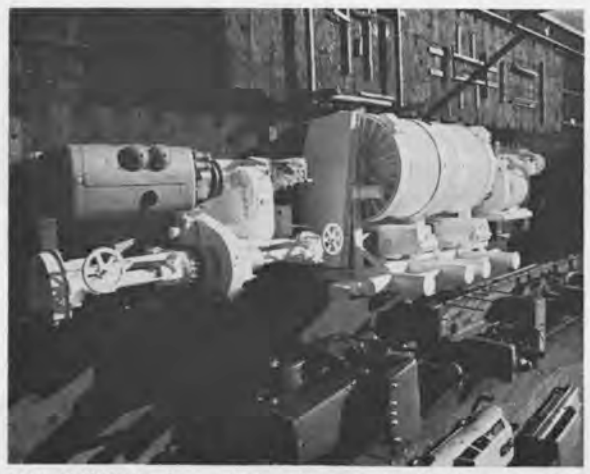
Some 8,000 representatives of the shipping and commerce industry are expected to attend the four-day convention.

Further information and applications for exhibit space can be obtained by contacting **Irwin I. Chaitin,** Executive Director, International Shipping and Containerization Exposition, 1601 W. Lafayette Boulevard, Detroit, Mich. 48216.

Two other important industry events will be held in conjunction with the exposition. A technical congress, directed by the Containerization Institute, will take place at the Coliseum Arena Monday through Wednesday of exposition week. The event will include lectures by industry experts, as well as discussions and seminars on numerous phases of containerized shipping.

On Thursday and Friday of that same week, the International Cargo Handling Coordination Association will hold a shipping symposium at the nearby Oakland Hilton Inn.

Shipping officials from throughout the world will discuss a host of topics relating to the efficient movement of cargo from origin to destination.



BIG WINCH: One of the largest double-drum towing winches ever built was recently completed by Markey Machinery Company, Inc., Seattle, Wash., and shipped for use on a new 145-foot-long tugboat that will be operated in the Gulf of Mexico by De Felice Marine Contractors, Inc., New Orleans, La. The big Markey winch has two drums that hold 2,600 feet of 2¼-inch diameter wire rope each, plus an auxiliary anchor drum that holds 1,000 feet of 2-inch rope. An estimated 15 tons of rope will be utilized for the two towing drums and the auxiliary anchor drum. The anchor drum will be capable of lifting and placing anchors weighing up to 15 tons. The winch, made from sheared plate produced by Bethlehem Steel Corporation's Sparrows Point, Md., plant, will be powered by a General Motors diesel engine, Model 671, that has a three-speed torque converter transmission.

FIRST SHIP TO GET KEY: The brand new S/S Eric K. Holzer became the first ship ever to receive the official Key to the City of New York. Making the presentation on behalf of Mayor **John Lindsay** to **R.D. Carter,** president, Transamerican Trailer Transport, owner of the ship, is **Ronald F. Javello** (right), executive director, New York City Council on Port Development and Promotion. Looking on at left is **Lou Jacobson,** Deputy Commissioner, Department of Ports and Terminals, Economic Development Administration. The S/S Eric K. Holzer has the world's largest capacity and is the fastest roll-on trailership, making the 1,600-mile New York to Puerto Rico run in only 58 hours—same time as her sister ship, the S/S Ponce de Leon.

Harold A. Hall Joins Independent Petroleum Supply

Harold A. Hall has joined the marine sales department of Independent Petroleum Supply Company (IPS) and will be located in its London office, according to **John T. Dutfield,** vice president.

Mr. **Hall's** responsibilities will include securing marine bunker sales for an affiliate, The West Indies Oil Company in Antigua, West Indies, and for other bunkering terminals in the Far East. Additionally, Mr. **Hall** will assist in the development of company business in Europe and the Near East and the Far East.

Mr. **Hall** is well-known in the oil industry. After a distinguished career in the Royal Navy, he joined the British Petroleum Company in Rome, and subsequently became international marine sales manager in Italy.

Independent Petroleum Supply Company (IPS), a Natomas Company subsidiary, concerns itself with various petroleum activities, particularly in the field of marketing, refining and tanker transportation. The main office of IPS is in New York City, with additional offices in London, San Francisco and Tokyo.

Valad Electric Develops Explosion-Proof Tanker Heaters

Valad Electric Heating Co. recently developed a line of forced air and convection explosion-proof electric space heaters for various tanker and in Class 1 Group C and Class 1 Group D atmospheres.

Forced air type heater has a heavy duty explosion-proof motor, hermetically sealed cast-aluminum electrical terminal housing, all hardware screws, thermostat shafts; on-off switches have rubber caps or "O" rings to prevent vapor leak; cast aluminum terminal box provided for hookup; brackets available for ceiling or bulkhead mounting. Heating elements are low density for Type C & D atmospheric condition.

The convection type heaters are low density and have an explosion-proof terminal box. Convection types come in different lengths, wattages, and voltages.

The firm also builds a complete line of other electric space heaters, galley and in-process heating equipment. Further information may be obtained by contacting **Peter Cecchini,** Valad Electric Heating Co., 71 Cortlandt Street, Tarrytown, N.Y. 10591.

LST Launching/Keel Laying In Dual Ceremony At NASSCO

The camera catches **Mrs. Milton R. Young,** sponsor, as she is about to smash the champagne bottle against the bow of the LaMoure County (LST-1194). With her on the christening platform are, left to right, the Honorable **Milton R. Young,** U.S. Senator from North Dakota; **Mrs. Elmo R. Zumwalt Jr.; John V. Banks,** NASSCO executive vice president; **Miss Jill McInnes,** maid of honor, and Adm. **Elmo R. Zumwalt Jr.,** Chief of Naval Operations.

The new Tank Landing Ship LaMoure County (LST-1194) was launched at National Steel and Shipbuilding Company, San Diego, Calif., February 13, 1971. The ceremony began at 9 a.m. with a band concert by the U.S. Marine Corps Recruit Depot Band.

The LaMoure County was launched under the sponsorship of **Mrs. Milton R. Young,** wife of U.S. Senator **Milton R. Young** of North Dakota. **Miss Jill McInnes,** of Marion, N.D., served as maid of honor. Adm. **Elmo R. Zumwalt Jr.,** USN, Chief of Naval Operations, main speaker for the launching, also officiated in the keel-laying ceremony of LST-1198, which immediately followed.

Others participating in the ceremonies were the Honorable **Milton R. Young,** U.S. Senator, North Dakota; Rear Adm. **Harry C. Mason,** USN, representing the Commander, Naval Ship Systems Command; Capt. **Robert E. Anderson,** USN, Force Chaplain, Amphibious Force, U.S. Pacific Fleet; Capt. **H.A. Gerdes,** USN, Supervisor of Shipbuilding, Conversion and Repair, USN, 11ND, San Diego, Calif.; **John V. Banks,** NASSCO executive vice president, and **John M. Murphy,** NASSCO vice president, sales.

The LaMoure County (LST-1194) is the first ship of the fleet named for the city and county in North Dakota.

The LaMoure County will have a greatly increased combat vehicular lift and landing capability over the Tank Landing Ships of World War II. Ships of her type will provide the Navy with new 20-knot ships to modernize the Amphibious Force. A Newport-class Tank Landing Ship, the LaMoure County has an overall length of 522 feet; beam of 69 feet; full load displacement of 8,000 tons, and a mean draft of 14 feet.

Approximately 3,000 people were on hand to witness the public ceremonies.

Adm. **Elmo R. Zumwalt Jr.,** USN, Chief of Naval Operations, demonstrated his welding expertise when laying the keel for LST-1198. Left to right, John **McQuaide,** NASSCO plant manager, Admiral **Zumwalt, and L.L. Adams,** NASSCO welding foreman.

Newfoundland Refining Charters 4 Tugs To Dock Supertankers At Come By Chance Refinery

Lord **Leathers,** chairman of Smit & Cory International Towage Ltd. of London, England, and **Homer White,** president of Newfoundland Refining Company Limited, jointly announced the signing of an agreement for the charter of four 2,500-hp seagoing tugs.

The four tugs will be built at Richard Dunston Ltd., Haven Shipyard, Hessle, Yorkshire, England. The tugs will be used at the site of the Newfoundland Refining Company Limited's refinery now being built at Come By Chance, Newfoundland, to handle the mammoth tankers, bringing crude oil from the Persian Gulf, product tankers and large barges in that deep water, ice free port.

The tugs will be operated by Newfoundland masters, engineers and crews, who will be sent to Europe for extensive training prior to operation at Come By Chance, Lord **Leathers** stated.

Smit & Cory International Port Towage Ltd. also operates tugs at Point Tupper, Nova Scotia, and their parent companies, L. Smit and Co's Internationale Sleepdienst and Cory Ship Towage Limited, operate tugs independently at Europoort, Rotterdam, Holland; Bantry Bay, Ireland, and Milford Haven, England.

Colt Industries Furnishes Fairbanks Morse Diesels To Power Huge Drilling Rigs

Marine drilling rigs—probably the most ungainly ocean craft built — are scattered throughout the oceans of the world in an ever-widening search for gas and oil.

One of the major companies involved in this search is Ocean Drilling and Exploration Co. of New Orleans, La. Operating some 14 rigs around the world, ODECO uses 35 Fairbanks Morse diesel engines built by Colt Industries' Power Systems Division in Beloit, Wis.

Initial trial runs were completed in mid-January on the most recent addition to the fleet—Ocean Prospector. This rig is powered by four Fairbanks Morse, 10-cylinder, Model 38D8-⅛ diesel engines. Each engine is rated at 1,600 hp at 720 rpm, and they drive eight 1,600 kw, traction type DC generators and two 1,000 kw, AC generators.

Two DC generators are mounted in series on each elongated, two-piece engine skid and direct connected to the engine. On two of the units, a third AC generator is also mounted on the skid and direct connected to the prime mover.

Fairbanks Morse opposed piston engines have long been associated with marine power around the world. The Model 38 series engines gained particular fame during World War II when they powered a large percentage of the U.S. submarine fleet, as well as surface vessels.

Commissioning ceremonies for the $12 million self-propelled, semi-submersible craft were held on January 30 at Mitsubishi Shipyard, Hiroshima, Japan, where it was built. The new rig will begin operations this month in the Sea of Japan under joint ownership of ODECO and Japan Industrial Land Development Company.

Trial runs indicate a speed of seven knots ahead and three knots astern. The rig has a minimum turning radius of approximately two barge lengths. A unique feature of the drilling unit is twin, kort nozzle type rudders which are located at the after end of each of the two inboard pontoons. Propulsion rooms, located in the pontoons, house the two direct current propulsion motors, shafting and related machinery. The two motors deliver 5,400 shaft horsepower.

Sixteen vertical columns are connected to the four pontoons to support the drilling platform. The top of the columns are 120 feet from the base of the pontoons. The Ocean Prospector is capable of carrying 2,250 long tons of variable load topside, with additional drill water and fuel oil in the pontoons at 70-foot draft.

The overall length is just over 344 feet, with beam measuring 263½ feet. The rated operating depth of the unit afloat is 600 feet of water. Storage capacities are 4,600 barrels of fuel, 14,087 barrels of drill water, 355 barrels of potable water, 1,370 barrels of liquid mud and 3,060 sacks of dry mud. The main deck area is 28,200 square feet. Additionally, there is a heliport and modern accommodations for 69 men.

Drilling equipment aboard the rig will be electrically powered from the Fairbanks Morse engines driving generators. This is the same power source used to energize the propulsion motors.

SNAME New York Hears Paper On Design Of Icebreakers

Attending the meeting at Stevens Institute were, left to right: **Charles W. Wilson,** secretary-treasurer of the Section; **Daniel D. Strohmeier,** SNAME national president; **J. Gordon German,** author; **Warren I. Signell,** chairman of the Section, and **Norman R. Farmer,** vice chairman.

The New York Metropolitan Section of The Society of Naval Architects and Marine Engineers met on February 23 at the Stevens Institute of Technology in Hoboken, N.J. The meeting began with a tour and demonstration of towing tank facilities at Davidson Laboratory, located at 711 Hudson Street, two blocks from Stevens Center.

At the technical session, which was preceded by a social hour and dinner, a technical paper entitled "Some Considerations in the Design of Polar Icebreakers" was presented by **J. Gordon German,** of German & Milne. The authors of the paper are **J.G. German, C.F. Collins,** and **A.R. Webster.**

This paper presents the results of some recent research in the field of icebreaker design by Canada's most eminent naval architect. Mr. **German** has been responsible for, or associated with, the majority of Canadian icebreaker designs, including the 27,000-hp T/E icebreaker CGCS Louis S. St-Laurent.

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Aqua-Chem Makes Changes —John C. Cleaver Retires, John Collings Is Promoted

John C. Cleaver

John K. Collings

Effective April 1, 1971, **John C. Cleaver,** founder and board chairman of Aqua-Chem, Inc., will retire.

Mr. **Cleaver** said his continuing duties will be those of a director of Aqua-Chem and The Coca-Cola Company, and a consultant to both. He said his retirement is the realization of a long-planned, personal objective.

At a board of directors meeting held on February 15, Mr. **Cleaver** nominated **John K. Collings,** now president of the company, to assume the additional duties of chief executive officer as well, effective April 1, 1971. Mr. **Collings,** a former executive with ITT, has been president of Aqua-Chem for the past year and was executive vice president before assuming the presidency.

Mr. **Cleaver** founded the J.C. Cleaver Company in 1928 to manufacture and market a new packaged boiler which he had conceived and designed. The invention revolutionized the boiler industry, which until that time had been one of gathering, from different sources, burner, boiler, instruments and other components and assembling them on the site. A side effect of great current significance, namely the cleanliness of the spent combustion gases which prevent air pollution, Mr. **Cleaver** said, "fell in our lap." Mr. **Cleaver's** concept was a single package with single source responsibility.

In 1932, the late **Raymond E. Brooks** joined Mr. **Cleaver** in the formation of Cleaver-Brooks Co. The company, just prior to the outbreak of World War II, began the manufacture of seawater desalting equipment at the request of the United States military service. After the war, the company decided to keep working in the desalting field even though there was virtually no commercial market. The research and development department pioneered many desalting ideas, among them the long tube flash evaporation design which is the basis of virtually all large desalting plants built today.

The Aqua-Chem name was applied to what had been the Cleaver-Brooks Special Products Division and which had done the desalting research. In 1967, Cleaver-Brooks and Aqua-Chem were merged under the latter name, and in May 1970, the company merged into The Coca-Cola Company.

Mr. **Cleaver** stated that he feels most fortunate to have been a part of the entire history of two major and important industries—the packaged boiler industry, and the desalting industry. He and his company pioneered in both and became a major factor in both in terms of systems installed worldwide. Cleaver-Brooks has built over 60,000 steam generators and the Water Technologies Division has produced over 5,000 desalting plants, including the largest system in operation, a 7½-million gallon per day unit in Tijuana, Mexico. According ot a recent survey, Aqua-Chem or its licensees have installed nearly 50 percent of all the seawater desalting capacity in the free world. In addition, similar purification plants are purifying industrial wastes from many processes, as well as radioactive wastes from nuclear power plants.

Mr. **Cleaver** announced that he expects to remain active in the area of research and development.

Replenishment Oiler Christened At General Dynamics—Quincy

The 37,360-ton naval fleet replenishment oiler is christened by **Mrs. William G. Bray,** wife of the Congressman from Indiana's Sixth District as **Lloyd Bergeson,** general manager of the Quincy shipyard, looks on.

The Wabash, a 37,360-ton fleet replenishment oiler, was christened at the Quincy Shipbuilding Division of General Dynamics. Officially designated as AOR-5 by the U.S. Navy, the ship was named by **Mrs. William G. Bray,** wife of the Congressman for the Sixth District of Indiana, before a large audience of guests and yard employees and their families.

The Wabash, named in honor of the city and river in Indiana, is the fifth of a versatile new class of supply ships designed to replenish operating forces at sea with a variety of provisions from fuel to munitions. From keel to christening, construction took one year—nine months faster than the first ship of the same class.

In the principal address, Congressman **Bray,** a veteran member of the House Armed Services Committee, called the Wabash "a response to the challenge of the presence of Soviet warships in the Caribbean."

In his welcoming remarks, **Roger Lewis,** president of General Dynamics, praised the progress at the Quincy Shipbuilding Division and noted that in 1970, four high-quality ships were delivered to the U.S. Navy on or ahead of schedule. He reported that new production records were set for steel erection, with double the tonnage erected the year before. Mr. **Lewis** added "The Quincy Shipyard has every reason to look forward to active participation in the growth of American shipbuilding, both military and commercial, in the 1970s."

Before introducing **Mrs. Bray** the sponsor, **Lloyd Bergeson,** general manager of the Quincy Shipbuilding Division, made a few remarks in tribute to the shipbuilding workers. "No other profession," he said, "demands as much of a man and installs as much pride as does shipbuilding. In today's impersonal, mechanized society, shipbuilding remains a final vestige in which the product of the individual's skills and labor bears the distinct mark of his individuality."

Oakley Martin Joins Texas Marine & Industrial

Oakley Martin, who was with the States Marine-Isthmian Agency for 21 years, has joined the staff of Texas Marine & Industrial Supply Company, **Gordon Waddell,** president, announced. Mr. **Martin,** who has had wide experience in provisioning ships, will be associated with the food division.

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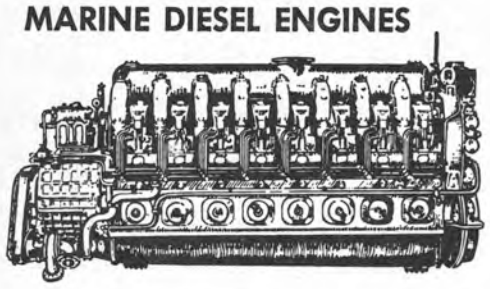

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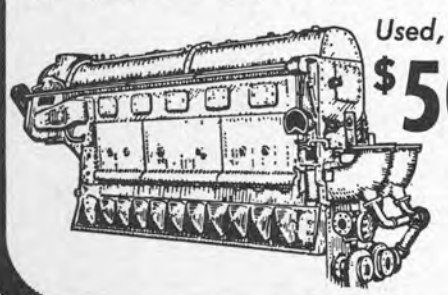

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MFR.	HP	VOLTS	RPM	TYPE	AMPS
Ideal Elec.	150	230	1200	D-28	534
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Ideal Elec.	40	230	1800	D	145
U. S. Elec.	150	440	1200	SC	198
Reliance	93.6	115	1750	TDC	690
Burke	20	230	1880	M6115	79.6
(W)	3.5	230	1780	CC212.30B	13.8
(W)	3.5	220/440	1750	CC212.31B	10.45.2
Holtzer	2	115	1460	MG133	14
Gen. Elec.	85	440	1765	5K505Y5	108
Gen. Elec.	85	440	1765	5K505Y5	108
Ideal Elec.	40	115	1800	D	290
Ideal Elec.	40	115	1800	D	290

MOTOR

MFR.	KW	VOLTS	RPM	AMPS
Ideal Elec.	100	450	1200	160
Ideal Elec.	100	450	1200	160
Ideal Elec.	25	450	1800	40
Delco	100	120/240	1200	417
Reliance	62.8	230	1750	273
Burke	25 KVA	120	1880	120
(W)	1.4	2000	1780	0.7
(W)	1.4	2000	1750	0.7
Holtzer	190	24	1460	70
Gen. Elec.	60	110	1765	545
Gen. Elec.	60	110	1765	545
Ideal Elec.	25	450	1800	40
Ideal Elec.	25	450	1800	40

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De Laval	300 KW
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Westinghouse (Victory type)	300 KW
Westinghouse	250 KW
Worthington	150 KW
Westinghouse CA 20	100 HP
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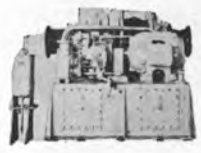

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G.M. 2-71

GEN: 20 KW 120 VDC 1200 RPM. ENGINE: GM 2-71 diesel — 2-cycle — 4¼ x 5 — 142 cu inch — clockwise — 24 volt start.

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Type "C" — Deck installation — self-aligning.

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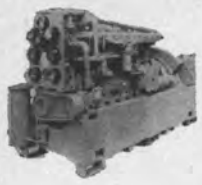

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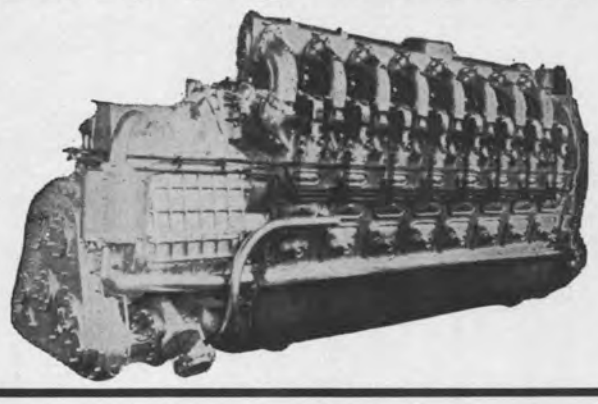

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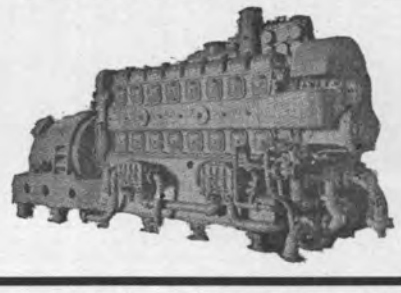

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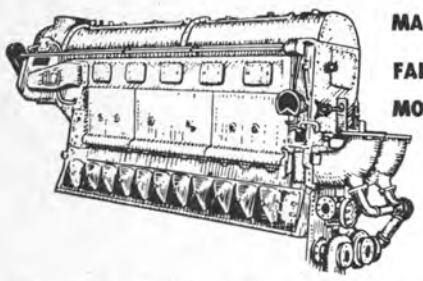

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Used condition, 1800 HP, 800 RPM, 2 cycle, 8½" bore, 10" stroke, Air Start. Complete with Westinghouse Reduction Gears, 2.216:1 ratio—with hydraulic coupling.

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JOY, Class WG82, 2-stage rated 100 CFM at 300 PSI, water cooled, size 7"x3⅜"x7" with Reliance motor, 30 HP, 220/440/AC/3/60.

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INGERSOLL-RAND, 150 CFM, 600 PSI, Model 75, with Westinghouse Motors, 75 HP, 230 DC.
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WORTHINGTON, 175 CFM, 125 PSI, with 50 HP Motors, 440/3/60.

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FARREL-BIRMINGHAM, as orig. used on two 1375 HP electric motors in submarine, 2 pinions, single output gear, Pinion RPM 1302, Gear RPM 280; ratio 4.65:1.

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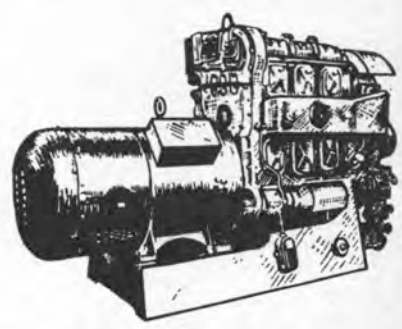
HERCULES DJXC, 25 KW, 120 DC.
CUMMINS A1, 30 KW, 120 DC.
MURPHY, Model ME 66, radiator cooled, 75 KW, 120/240 Volts DC.
CATERPILLAR DIESEL ENGINE, D13000, 85 KW, 220 AC.
LORIMER, F5SS, 75 KW, 120/240 DC, radiator cooled.
COOPER-BESSEMER, JS-5, 250 KW, 240 DC.
FAIRBANKS-MORSE, 38E5¼, 300 KW, 260/345 DC.
GM 8-268, 300 KW, 260/345 DC.



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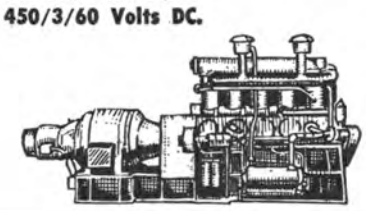

BUDA 6DHG691, 60 KW, 120 Volts DC.
GM-3-268A, 100 KW, 240/120 Volts DC.
SUPERIOR GBD-8, 100 KW, 240/120 Volts DC.
SUPERIOR, Model IDB-8, 100 KW, 450/3/60.
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GM 8-268A, radiator cooled, air start with Westinghouse Generator, 250 KW, 440/3/60, complete with switchboard.

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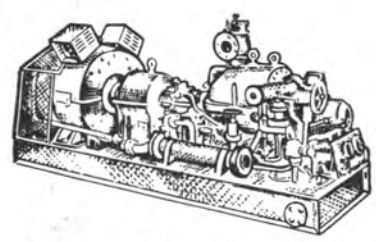

ALLIS-CHALMERS, 440 PSI, 740 F, with Allis-Chalmers Generators, 300 KW, 120/240 DC.

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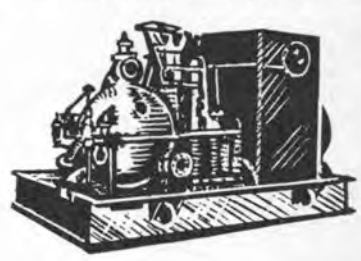
GENERAL ELECTRIC, DORV 325, 300 KW, 440/3/60.

GE DORV Turbines, with GE Generators, 200 KW, 440/3/60.

TERRY TURBINES, type TM5, 440 PSI, 750° F, with Crocker-Wheeler Generators, 300 KW, 120/240 DC.



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2—Goulds, 2000 GPM, 470' head, Size 8x10, with Westinghouse Motors, 350 HP, 2300/3/60.

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4—Worthington, size 3UBI, 400 GPM, 280' head, 50 HP, 440 AC.

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WORTHINGTON, 200 GPM, 100 PSI, 3½" suction, 3" discharge, with Wagner Motors, 25 HP, 440/3/60.

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6—682 GPM, 60' TDH, C.I. pump housing, 5" suction, 5" discharge, with Westinghouse Motors, 15 HP, 220/440/3/60, 1700 RPM.

2—Worthington, 80 GPM, 60 PSI, 2½" suction, 2" discharge, with G.E. Motors, 8 HP, 440/3/60, 3450 RPM.

3—Worthington, 650 GPM, 9 PSI, 6" suction, 6" discharge, with Star Motors, 6 HP, 440/3/60.

1—Worthington, 175 GPM, 20 PSI, 3½" suction, 3" discharge, with G.E. Motor, 3.74 HP, 440/3/60, 3450 RPM.

4—Worthington, 60 GPM, 22 PSI, 3½" suction, 2" discharge, with G.E. Motors, 3 HP, 440/3/60, 3450 RPM.

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5—Worthington, 30 GPM, 30 PSI, 1½" suction, 1½" discharge, with G.E. Motors, 1.75 HP, 440/3/60.

14—Warren, 6 GPM, 36 PSI, 1¼" suction, 1" discharge, with G.E. Motors, 1.25 HP, 440/3/60, 3450 RPM.

6—Worthington, 275 GPM, 56.6 PSI, 8½" suction, 3½" discharge, with G.E. Motors, 22.9 HP, 440/3/60, 1180 RPM.

BOILER FEED PUMPS — TURBINE & ELECTRIC

4—Worthington, Vertical type, single acting, triplex, constant speed, size 2¼ x 4, 47 GPM, 525 PSI, with G.E. Motors, 20 HP, 230 Volts DC.

2—Worthington, 5" UFD, 460 GPM, 750 PSI, 5" suction, 5" discharge, driven by Sturtevant Steam Turbine, Size CC-22', Type 21, 2½" steam inlet, 5½" exhaust.

2—Aldrich Pump Co. Triplex, Vertical, Size 2½ x 4, 65 GPM, 575 PSI, with G.E. Motors, 25 HP, 230 Volts DC.

2—Ingersoll-Rand, 165 GPM, 575 PSI, with turbine drives.

TURBINE DRIVEN PUMPS — Various

2—Worthington, Size 20-LAL-18, Main Condenser, Centrifugal, 10500, 27' head, Vertical, with Whiton Turbines, 95 HP.

1—Ingersoll-Rand, Size 5UV, Centrifugal, Horizontal, 1200 GPM, 225' head, 6" suction, 5" discharge, with Elliot Turbine, 84.3 HP.

1—Worthington, Fire, Flushing & Emergency Bilge, Centrifugal, Horizontal, Rating—Fire: 500 GPM, 150 PSI, Flushing: 1000 GPM, 60 PSI, Bilge: 750 GPM, 25 PSI, 5½" suction, 4½" discharge, with Whiton Turbines, 72.9 HP.

1—DeLaval, Fuel Oil Transfer, Vertical, Rotary, 250 GPM, 150 PSI, 7" suction, 6" discharge, with DeLaval Turbine, 35 BHP.

8—Goulds Main Circulating, Vertical, Centrifugal, 3700 GPM, 13 PSI, Size 12", with Elliot Turbines, 30 HP.

2—DeLaval Fuel Oil Service, Vertical, Rotary, 50 GPM, 350 PSI, 3½" suction, 3½" discharge, with DeLaval Turbines, 14.4 HP.

4—DeLaval—IMO, L.O. Service, Vertical, Rotary, 300 GPM, 45 PSI, 6" suction, 6" discharge, with DeLaval Turbines, 14.1 HP.

8—Allis-Chalmers, Type SSC-V, 68 GPM, 114' head, 3" suction, 1½" discharge, with Carling Turbines, 7½ HP, 1750 RPM.

2—Warren, 85 GPM, 60 PSI, For Lube Oil Service, Turbine Driven.

2—Warren, Main Circulating, 3500 GPM, 13.5 PSI, Turbine Driven.

AC PUMPS—Vertical Centrifugal

4—Worthington, 490 GPM, 35 PSI, 7" suction, 4½" discharge, with G.E. Motors, 19.6 HP, 440/3/60, 1175 RPM.

6—Chicago Pump Co., submersible, 400 GPM, 6 # suction, 30 # discharge pressure, with Wagner Motors, 15 HP, 440/3/60, 1740 RPM.

6—Dayton-Dowd, 1160 RPM, 15 PSI, 10" suction, 8" discharge, with Wagner Motors, 10 HP, 440/3/60.

4—Worthington, 100 GPM, 40 PSI, 5" suction, 3" discharge, with G.E. Motors, 7.37 HP, 440/3/60, 1750 RPM.

4—Warren, 135 GPM, 35 PSI, 6" suction, 3" discharge, with G.E. Motors, 6 HP, 440/3/60.

1—Worthington, 35 GPM, 62.4 PSI, 3" suction, 2" discharge, with G.E. Motors, 5.83 HP, 440/3/60, 1150 RPM.

7—Allis-Chalmers, 68 GPM, 114' head, Type SSV-C, 3" suction, 1½" discharge, with Wagner Motors, 7½ HP, 440/3/60, 1750 RPM.

3—Worthington, 350 GPM, 11.1 PSI, 10" suction, 3½" discharge, with G.E. Motors, 5 HP, 440/3/60, 1150 RPM.

12—Allis-Chalmers, 10 GPM, Size 2"x2½", with Wagner Motors, 3 HP, 440/3/60, 3600 RPM.

AC PUMPS—Horizontal Rotary

4—Warren, 197 GPM, 175 PSI, with Electro Dynamics Motors, 30 HP, 440/3/60, 1750 RPM.

2—Northern, 10 GPM, 350 PSI, 3" suction, 2" discharge, 200 RPM, with G.E. geared Motors, 5 HP, 440/3/60.

3—DeLaval, 25 GPM, 50 PSI, with G.E. Motors, 1.8 HP, 440/3/60.

AC PUMPS—Vertical Rotary

2—DeLaval, 550 GPM, 50 PSI, with G.E. Motors, 27.4 HP, 440/3/60, 1180 RPM.

7—Quimby, Size 2½, 10/6 GPM, 350 PSI, 2½" suction, 1½" discharge, with Wagner Motors, 6/3 HP, 440/3/60, 1160/865 RPM.

8—Blackmer, 50 GPM, 35 PSI, 420 RPM, with G.E. geared Motors, 2 HP, 440/3/60, 1750 RPM.

DC PUMPS—Horizontal Centrifugal

6—Worthington, Size 8L1, 2100 GPM, 138.5 TDM, with Westinghouse Motors, 100 HP, 230 DC, 1310/1750 RPM.

6—Worthington, Size 12 LA1, 4000 GPM, 67.3 TDM, with Westinghouse Motors, 100 HP, 230 DC, 1310/1750 RPM.

6—Worthington, Size 3UB1, 400 GPM, 280' head, with Westinghouse Motor, 50 HP, 230 DC, 1310/1750 RPM.

6—Worthington, Size 4L1, 400 GPM, 83' head, with Westinghouse Motors, 15 HP, 230 DC, 1225/1750 RPM.

1—Aldrich, 8" suction, 6" discharge, with G.E. Motor, 12/25 HP, 115 DC.

3—Warren, 1175 GPM, 11.2 PSI, with Reliance Motors, 10 HP, 230 DC.

1—Westco, 100 GPM, 100 PSI, 2" suction, 2" discharge, with 10 HP Imperial Motor, 115 DC.

2—Yeomans, 135 GPM, 3" suction, 115' head, 3" discharge, with Kimble Motor, 10 HP, 230 Volts DC.

2—Warren, size 5, 600 GPM, with Electro-Dynamics Motors, 8/4.5 HP, 230 Volts DC.

1—Warren, 5" suction, 4" discharge, with Reliance Motor, 7½ HP, 115 Volts DC.

1—Dayton-Dowd, 3" suction, 2½" discharge, with Crocker-Wheeler Motor, 5 HP, 120 DC.

1—Ingersoll-Rand, Model A, 45 GPM, 125' head, with G.E. Motor, 5 HP, 115 Volts DC.

3—Ingersoll-Rand, Size 1MVR, 50 GPM, with Electro-Dynamics Motors, 3.9 HP, 230 DC.

1—Fairbanks-Morse, 250 GPM, 13' head, with Fairbanks-Morse Motor, 3.72 HP, 230 Volts DC.

2—Worthington, 150 GPM, 22 PSI, 3½" suction, 3" discharge, with Diehl Motors, 3.47 HP, 230 Volts DC.

DC PUMPS—Horizontal Centrifugal

1—Yeomans, 40 GPM, 75' head, 1½" suction, 1" discharge, with Master Motor, 2 HP, 230 Volts DC.

2—Westco, 20 GPM, 50 PSI, with Century Motors, 1½ HP, 120 Volts DC.

2—Worthington, 60 GPM, 23.7 PSI, 2½" suction, 2" discharge, with Diehl Motors, 1.43 HP, 230 Volts DC.

7—Warren, 4 GPM, 38 PSI, 1½" suction, 1" discharge, with Century Motor (4-230 DC, 3-115 DC), 1.25 HP.

DC PUMPS—Vertical Centrifugal

2—Buffalo, Size 3 SAV, 400 GPM, 125 TDH, with Electro-Dynamic Motors, 50 HP, 230 Volts DC, 1350/1800 RPM.

1—Gardner-Denver, 1500 GPM, 56' head, 8" suction, 6" discharge, with Century Motor, 30 HP, 230 Volts DC, 1750 RPM.

1—Ingersoll-Rand, Size 18VCM, 8500 GPM, with Electro-Dynamic Motor, 20/40 HP, 230 Volts DC, 410/545 RPM.

2—Worthington, 16" LAS-2, 5600 GPM, 10 PSI, with G.E. Motor, 20/40 HP, 230 Volts DC, 540/720 RPM.

1—Ingersoll-Rand, 10" suction, 10" discharge, 1050/2000 GPM, with G.E. Motor, 20 HP, 230 Volts DC, 805/1150 RPM.

1—Worthington, 340 GPM, 33.6' 6" suction, 3" discharge, with G.E. Motor, 15 HP, 230 Volts DC.

2—Ingersoll-Rand, 450 GPM, 15' head, 4" suction, 3" discharge, with G.E. Motors, 10/15 HP, 230 Volts DC, 1300/1750 RPM.

2—Buffalo, Size 3SLV, 425 GPM, 35 TDH, with Electro Dynamic Motors, 7½/15 HP, 230 Volts DC, 1310/1750 RPM.

1—Worthington, 175 GPM, 50 PSI, 4" suction, with G.E. Motor, 7½ HP, 230 Volts DC.

2—Ingersoll-Rand, Size ..... 8 VCM, 1400 GPM, with Electro Dynamic Motors, 5/10 HP, 230 Volts DC, 950 RPM.

2—Ingersoll-Rand, Size 1½ VBM, 70 GPM, with Electro Dynamic Motors, 5/10 HP, 230 Volts DC, 1500/2000 RPM.

2—Ingersoll-Rand, Size 1MVR, 20 GPM, with Electro Dynamic Motors, 3/1.5 HP, 230 Volts DC, 1950/2600 RPM.

2—Worthington, 8" LS-1, 1400 GPM, 10 PSI, with G.E. Motors, 5/10 HP, 230 Volts DC, 875/1200 RPM.

2—Worthington, Type 1½ UZS-3, 20 GPM, 75 PSI, with G.E. Motors, 5 HP, 230 Volts DC, 1800 RPM.

2—Weil, 20 GPM, 40 PSI, 1½" suction, 1¼" discharge, with G.E. Motors, 3 HP, 230 Volts DC.

DC PUMPS—Horizontal Rotary

3—Worthington, Size 5GES, 400 GPM, 50 PSI, with Westinghouse Motors, 20 HP, 230 Volts DC, 1750 RPM.

1—DeLaval, 15 GPM, 350 PSI, 2½" suction, 2½" discharge, with Diehl Motor, 10 HP, 230 Volts DC.

2—Viking, Type EKK, 60 GPM, 70 PSI, 2" suction, 2" discharge, with Diehl Motors, 5 HP, 230 Volts DC.

3—National Transit, 50 GPM, 50 PSI, 3" suction, 2½" discharge, 3 HP, 230 Volts

DC PUMPS—Vertical Rotary

6—Quimby, Size 5, 400 GPM, 60 PSI, 6" suction, 5" discharge, with Westinghouse Motors, 30 HP, 230 Volts DC.

3—Worthington, Model 4GRVS, 225 GPM, 35 PSI, with G.E. Motors, 15/20 HP, 230 Volts DC.

1—Quimby, Size 4, 175 GPM, with Electro Dynamic Motor, 7.5/10 HP, 230 Volts DC, 865/1150 RPM.

2—Worthington, Type 3GRVS, 90 GPM, 75 PSI, 2¾" suction, 2½" discharge, with Diehl Motors, 7½ HP, 230 Volts DC.

1—Quimby, Size 2, 8 GPM, with Electro Dynamic Motor, 2/5 HP, 230 Volts DC, 575/1150 RPM.

2—Worthington, Type 2GRVS, 7 GPM, 400 PSI, with G.E. Motors, 2½/5 HP, 230 Volts DC, 900/1800 RPM.

STOCKLESS ANCHORS
USED, GOOD QUALITY . . . SAVE!

2,000 pound size
3,000 pound size
8,000 pound size

ANCHOR CHAIN . . .
Used, good, with or without test certificate . . .

1" size
1 1/8" size
1 1/2" size
1 3/8" size
2 1/16" size
2 1/4" size

ANCHOR WINDLASS

1 LIDGERWOOD horizontal Anchor Windlass, double wildcat—for 2 1/16" Chain, double gypsy, with 50 motors, 230 volts, DC, complete with controls.

1—Horizontal, of German Mfg., double wildcat—for use with 3" anchor chain, double gypsy with 230 VDC motor, complete with electrical control equipment.

American Engineering, horizontal, double 2⅛" Chain, 65 HP, 230 DC, complete.

7—American Hoist and Derrick Company, horizontal, double wildcat—for 2¼" chain double gypsy, 70 HP, 230 Volts DC, with electric controls.

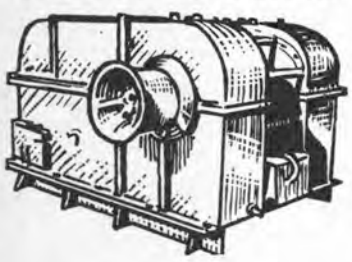
3—Hesse-Ersted, horizontal, double wildcat, 2⅛" chain, 60 HP, 230 DC.

1—Hyde Horizontal Anchor Windlass double wildcat—for use with 2⅛" Anchor Chain, and with General Motors Electric Motor, 60 HP, 230 volts DC, 560/1700 RPM, Type CDM 18831 AE. Complete with Contractor Panel, Resistors, and Master Switch.

ANCHOR WINCHES

2—Jaeger, single drum—capacity approximately 900' of 1½" wire rope, double gypsy, with 35 HP Motors, 230 Volts DC, complete with electricals.

UNIWINCHES



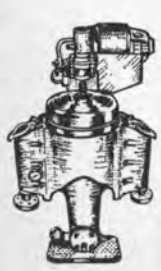
LAKESHORE UNWINCHES, with Allis-Chalmers Motors, 50 HP, 230 Volts DC, complete with Control Equipment.

Single speed, double drum, 7450 # at 220 FPM.

Single speed, single drum, 7450 # at 220 FPM.

Two speed, single drum, 7450 # at 220 FPM, 14400 # at 105 FPM.

CENTRIFUGES

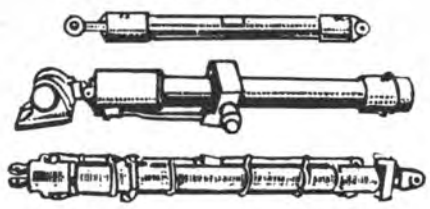


Sharples Purifiers—For Diesel Service or for Lube Oil Service.

150 GPH—440 AC, 230 DC
350 GPH—230 DC
600 GPH—230 DC

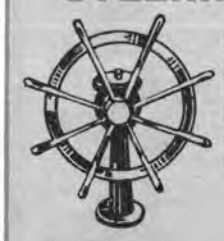
ALSO: De Laval, Size 65N131, 1½ HP, 440 AC.

HYDRAULIC CYLINDERS



3000 PSI	Bore	Stroke	Rod Diameter	Overall 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
	13"	9'7"	5½"	14'	double

STEERING STANDS



Brass Steering Stands. Complete with angle indicator on top, used, 11" base diameter by 35½" high, and with 42" overall, 8-spoke brass steering wheel.

$225 each

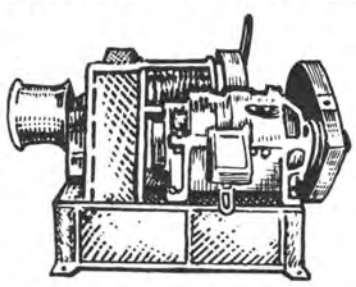
CAPSTAN WINDLASSES

Model CWP-3, Vertical 24" Planetary Capstan Windlasses, Single Wildcat — using 1¼" Anchor Chain, Single Gypsy with 20 HP motor, 230 volts DC, complete with Contactor Panel, Master Switch, and Resistors.

3—Hesse-Ersted Vertical, Single Wildcat—for 1⅜" Anchor Chain, single gypsy, with HP General Electric Motor, 230 Volts DC, complete with Controller equipment.

Hyde, Vertical, Single Wildcat, for 1⅛" Anchor Chain, single gypsy, with 20/5 HP Motor, 440/3/60.

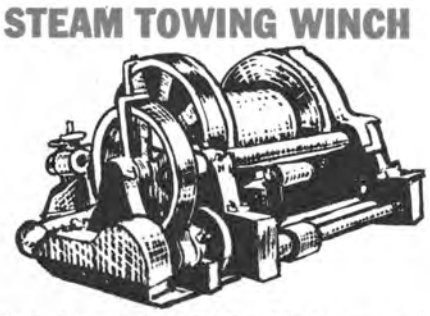
CARGO WINCHES



American Hoist and Derrick Company Winches with Westinghouse Motors, 50 HP, 230 Volts DC, complete with Contractor Panels, Master Switches, and Resistors.

Type 66—single speed, single drum.
Type 67—two speed, single drum.

STEAM TOWING WINCH



Single drum, capacity 2000' of 2" wire rope, cylinder size 9" bore by 10" stroke.

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To Give You These Features:

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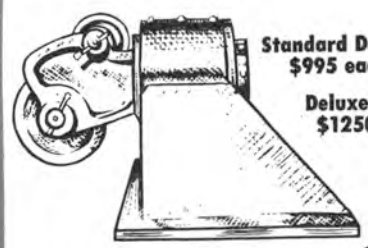
Self Aligning, Swivel Type Head.

Dependable and Ruggedly built to perform consistently year after year with minimum maintenance.

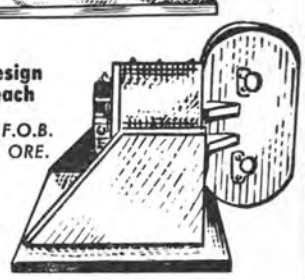


Standard Design $995 each

Deluxe Design $1250 each

Model Design $1350 each

PRICES ARE F.O.B. PORTLAND, ORE.



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Rebuilt—Guaranteed

LaDel, STURTEVANT etc.

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

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Size A1¼	**Size A5**
Size A1½	**Size A6**
Size A1	**Size A8**
Size A2	**Size A10**
Size A3	**Size A12**
Size A4	**Size A16**

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(Flexible Couplings betwen Turbines and Reducing Gear)

1—Set from C3-S1-A3 Vessel
1—Set from C2-S-B1 (Moore built)
1—Set from AP2 Victory Ship

PROPELLERS

From C3-S1-A3 Vessel
From AP2 Victory
From C2-S1-B1 Vessel
From Liberty Ships and LST Vessels

PROPELLER SHAFTS

From C3-S1-A3 Vessel
From C2-S-B1 Vessel (Moore built)
From AP2 Victory
From Liberty Ships

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, repeater panel, and repeaters with mounts.

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TURBINES, High Pressure and Low Pressure, manufactured by G.E., develop 6,000 HP (2 sets Available)

REDUCTION GEARS, G.E., 6,000 HP, RPM 6072-4048-882-92 (2 available)

MAIN CONDENSERS, Worthington, 5500 sq. ft. (2)

LUBE OIL PURIFIERS, De Laval, Model 55-13, 2 HP, 230 DC.

MAIN FEED PUMP, Worthington, Size 4 x 6, 35/50 HP, 230 DC (2)

AUXILIARY FEED PUMP, Worthington, steam, Size 11 x 7 x 24 (2)

PORT FEED PUMP, Worthington, steam, Size 9½ x 6 x 24 (2)

AUXILIARY CIRCULATING PUMP, Worthington, Size 8LS-1, 1240 GPM, 24.6' head, 10 HP, 230 DC (6)

MAIN CONDENSATE PUMP, Worthington, Size 2½-UZ-1, 120 GPM, 208 TDH, 15 HP, 230 DC (6)

AUXILIARY CIRCULATING PUMP, Worthington, Size 1½-UZS-3, 20 GPM, 208 TDH, 5 HP, 230 DC (6)

LUBE OIL SERVICE PUMP, De Laval-Imo, 250 GPM, 40 PSI, 15 HP, 230 DC (2)

LUBE OIL SERVICE STANDBY PUMP, Worthington, steam, Size 5½ x 2¾ x 6 (2)

FUEL OIL TRANSFER PUMP, De Laval, 225 GPM, 50 PSI, 15 HP, 230 DC (2)

FIRE PUMP, Worthington, Size 3-UBS-1, 400 GPM, 280' head, 50 HP, 230 DC (2)

STANDBY FIRE PUMP, Worthington, Steam, Size 12 x 11 x 18 (2)

BILGE PUMP, Worthington, Size 5LS-1, 415 GPM, 78.5 TDM, 20 HP, 230 DC (2)

BALLAST PUMP, Worthington, Size 5LS-1, 415 GPM, 78.5 TDM, 20 HP, 230 DC (2)

GENERAL SERVICE PUMP, Worthington, Steam, Size 10 x 11 x 18 (2)

SANITARY PUMP, Worthington, Size 2½ x 2, 2HP, 230 DC (4)

DRINKING WATER PUMPS, Size 2⅛ x 2, ¾ HP, 230 DC (4)

VACUUM PRIMING PUMPS, size MD537, 1½HP, 230 DC (4)

FORCED DRAFT FAN, Size 3½ AHS, 7880/5970 CFM, S.P.—6.2/14 with G.E. motors 5/25 HP, 230 DC, 1910/3120 RPM (7)

STEERING GEAR WATERBURY PUMP, Type A, Size 5, with 20 HP G.E. motor, 230 DC (4)

Also Machinery and Equipment from VC2-S-AP2 VICTORY SHIPS

CARGO HOISTER BLOCKS

5 ton rated, steel, as removed from surplus Liberty Ships. Manufactured by Young, Draper, etc. 12" or 14" sizes, your choice

$34.50 each

$39.50 each with pull test certificates.

We have Bull Gear and matching Pinions for C3 FALK REDUCTION GEARS

HP TURBINE, Allis-Chalmers, Impulse Reaction type, 5003 RPM, 740° F, 440 PSI, Serial #1737.

LP TURBINE, Allis-Chalmers, Straight Reaction, Type, 4289 RPM, 740° F, 440 PSI, Serial #1738.

CARGO WINCHES

Jaeger, 2 drum, 2 speed, 50 HP, 230 DC.

Parkersburg, 2 drum, 1 speed, 50 HP, 230 DC.

O.C.S., 2 drum, 1 speed 50 HP, 230 DC.

Vulcan, 1 drum, 2 speed, 50 HP, 230 DC.

American Hoist & Derrick, 1 speed, 1 drum, 50 HP, 230 DC.

LAKESHORE TOPPING WINCHES, single speed, capacity 10,000 # at 67 FPM, 5 HP, 230 DC.

ANCHOR WINDLASS, Markey, Type CWA-4, horizontal, double wildcat—for 2 5/16" anchor chain, 70 HP, 230 DC.

FUEL OIL STANDBY PUMP, Worthington, horizontal duplex, Size 5½" x 3" x 6", 13 GPM, 410 PSI.

GENERAL SERVICE PUMP, Worthington, vertical simplex, Size 12 x 14 x 18, 600 GPM, 50 PSI.

BOILER FEED PUMP, Worthington Auxiliary, vertical simplex, Size 11 x 7 x 24, 120 GPM, 550 PSI.

FRESH WATER PUMPS, 2—Worthington, Size 4x6, horizontal duplex, 100 GPM, 80 PSI, 7½ HP, 230 DC.

BALLAST PUMP, Allis-Chalmers, Type SGV, Size 5 x 5, vertical centrifugal, 600 GPM, 30 PSI, 20 HP, 230 DC.

SUBMERSIBLE BILGE PUMPS, 2—Worthington, 5", vertical centrifugal, 600 GPM, 30 PSI, 20 HP, 230 DC.

BILGE PUMP, Allis-Chalmers, Size 5 x 5, Type SGV, vertical centrifugal, 600 GPM, 30 PSI, 20 HP, 230 DC.

EVAPORATOR TUBE NEST DRAIN PUMPS, 2—Allis-Chalmers, Type SS-LH, horizontal, Size 2½ x 2, 17 GPM, 127' head, 5 HP, 230 DC.

MAIN CONDENSATE PUMPS, 2—Allis-Chalmers, Type CF-2V, vertical volute, Size 6 x 3½, 170 GPM, 208' head, 20 HP, 230 DC.

DISTILLER CONDENSATE PUMPS, 2—Allis-Chalmers, Type SS-L, horizontal centrifugal, Size 4 x 2, 45 GPM, 2 HP, 230 DC.

AUXILIARY CONDENSATE PUMPS, 2—Allis-Chalmers, Type CF-2V, vertical volute, Size 2½ x 1½, 30 GPM, 208' head, 7½ HP, 230 DC.

DIESEL OIL PUMP, Viking, Type ZKK, gear type, Size 3 x 2½, 40 GPM, 30 PSI, 2 HP, 230 DC.

DISTILLER FRESH WATER DISTRIBUTION PUMPS, 2—Allis-Chalmers, Type SS-DH, horizontal centrifugal, Size 2½ x 2, 55 GPM, 51' head, 2 HP, 230 DC.

FIRE PUMPS, 2—Allis-Chalmers, Type B2-V, vertical centrifugal, Size 4 x 3, 400 GPM, 280' head, 50 HP, 230 DC.

MAIN FEED PUMP, Terry Turbine, Type ZS-1, 124 HP, with Ingersoll-Rand horizontal pump, Size 4 x 3½, 4 stage, 250 GPM, 1340' head.

STEERING GEAR PUMP, Waterbury, Size 5, Type K, with Westinghouse Motor, 55 HP, 230 Volts DC.

LUBE OIL SERVICE PUMPS, 2—Quimby, vertical screw, Size 5, 400 GPM, 48 PSI, 6 x 5, 25 HP, 230 DC.

FUEL OIL TRANSFER PUMP, Quimby, vertical screw, Size 4D, 225 GPM, 50 PSI, 15 HP, 230 DC.

FUEL OIL SERVICE PUMP, Quimby, vertical screw, Size 2½, 20 GPM, 400 PSI, 2½ x 1½, 10 HP, 230 DC.

ICE WATER CIRCULATING PUMP, Allis-Chalmers, Type SS-RH, 10 GPM, 81' head, 1" x ¾", vertical volute, 1 HP, 230 DC.

HOT WATER CIRCULATING PUMP, Allis-Chalmers, Type SS-HH, 35 GPM, 70' head, 1¼ x 1¼, vertical volute, 2 HP, 230 DC.

REFRIGERATION CONDENSER CIRCULATING PUMPS, 2—Allis-Chalmers, Type SJK, 180 GPM, 81' head, 2½ x 2, horizontal volute, 7½ HP, 230 DC.

MAIN CONDENSER CIRCULATING PUMP, Allis-Chalmers, Type LS-V, 12,550 GPM, 20' head, 20 x 20, vertical volute, 100 HP, 230 DC.

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230 Volt DC Motor

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Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110
Morris Guralnick, Associates, Inc., 583 Market St., San Francisco, Calif. 94105
J. J. Henry Co., Inc., 90 West St., New York, N.Y. 10006
L. K. Homyer, Box 408, Corona Del Mar, California 92625
C. T. Ilariucci & Associates, Tourism Pier #3, San Juan, Porto Rico 00902
James S. Krogen, 1460 Brickell Ave., Miami, Fla. 33131
Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460
Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567
Marine Applications Co., Inc., P.O. Box 167, Mineola, N.Y. 11502
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., 110 Wall St., N.Y., N.Y. 10005
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01782
Robert Moore Corp., 350 Main St., Port Washington, N.Y. 11050
Gunnar Nelson, 2185 Lemoine Ave., Ft. Lee, N.J. 07024
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156
Philip L. Rhodes, Inc., 369 Lexington Ave., New York, N.Y. 10017
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 45 Second 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
Philip F. Spaulding & Associates, 65 Marion St., Seattle, Wash. 98104
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
H. Newton Whittelsey, 17 Battery Pl., New York, N.Y. 10004
Alan Winkley, 6420 Colby St., Oakland, Calif. 94618

OIL PURIFIERS—Repair
Peck Equipment Co., 3500 Elm Avenue, Portsmouth, Virginia 23704

OILS—Marine—Additives
Esso International Inc., 15 West 51 St., New York, N.Y. 10019
Ethyl Corp. Marine Div. Perolin Co., New York, N.Y. 10001
Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019
Humble Oil & Refining Co., Humble Building, Houston, Texas 77002
Mobil Oil Corp., 26 Broadway, New York, N.Y. 10004
Refineria Panama, S. A., 277 Park Ave., New York, N.Y. 10017
Shell Oil Co., 50 W. 50 St., New York 10020
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, Subsidiary Celanese Coats Co., 224 E. Broadway, Louisville, Ky. 40201
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020
Ferboil Company, 90 West St., New York, N.Y. 10006
Intercoastal Corp., 2320 Edgewater Ave., Baltimore, Md. 21222
International Paint Co., 21 West St., New York, N.Y. 10006
Mobil Chemical Company, Metuchen, N.J. 08840
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.
Woolsey Marine Industries Inc., 201 E. 42nd St., New York, N.Y. 10017

PETROLEUM SUPPLIES
Independent Petroleum Supply Co., 1345 Ave. of Americas, New York, N.Y. 10019
Refineria Panama, S. A. 277 Park Ave., New York, N.Y. 10017
Shell Oil Co., 50 W. 50 St., New York, N.Y. 10020
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017
The West Indies Oil Co., Ltd. St. John's, Antigua, W. I.

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
Rotocast Plastic Products, Inc., 6700 N.W. 36th Ave., Miami, Florida 33147

POLLUTION CONTROL
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020
Hemisphere Marine Chemicals Co., Inc., 300 Main St., Orange, N.J.

PROPELLERS: NEW AND RECONDITIONED
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Bird-Johnson Co., 883 Main Street, Walpole, Mass. 02081
Coolidge Propeller Co., 1608 Fairview Ave. E., Seattle, Wash. 98102
Federal Propellers, 1501 Buchanan Ave. S.W., Grand Rapids, Mich. 49502
Ferguson Propeller, 1132 Clinton St., Hoboken, N.J. 07030

PUMPS
Coffin Turbo Pump/FMC Corp. 326 So. Dean St., Englewood, N.J. 97631
Colt Industries, Inc., Fairbanks Morse Pump & Electric Div., 3601 Kansas Ave., Kansas City. Kansas 66110
Goulds Pumps, Seneca Falls, N.Y. 13148
Worthington Corporation, Harrison, New Jersey 07029

RATCHETS
American Engineered Products Co., Box 74, McKees Rocks, Pa. 15136

REFRIGERATION—Refrigerant Valves
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
York Corp., Grantley Road. York, Pa. 17405

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
Jackson Rope Corp., 9th & Oley, Reading, Pa. 19604
Samson Cordage Works, 470 Atlantic Ave., Boston, Mass. 02210
Tubbs Cordage Company, P.O. Box 709, Orange, Calif. 92669
Wall Rope Works, Inc., Beverly, N. J. 08010

RUBBER PRODUCTS—Dock Fenders, Hose, Life Preservers
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Yokohama Rubber Co. Ltd., P.O. Box 46, Shiba, Tokyo 105, Japan

RUDDER ANGLE INDICATORS
Electric Tachometer Corp., 68th & Upland Street, Phila., Pa. 19142
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.

SCAFFOLDING
Patent Scaffolding Co., 11-11 - 34th Ave., Long Island City, N.Y. 11106

SEALS
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
Syntron, Div. FMC Corp., 398 Lexington Ave., Homer City, Pa. 15748

SEARCHLIGHTS
Snelson Oilfield Lighting Co., 1201 E. Doggett St., Fort Worth, Texas 76104

SEWAGE DISPOSAL
Seapax, Inc., 3645 Warrensville Center Rd., Cleveland, Ohio 44122
Youngstown Welding & Engineering Co., 3708 Oakwood Ave., Youngstown, Ohio 44509

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

SHIPBREAKING—Salvage
The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202
National Metal & Steel Corp., 1251 New Dock St., Terminal Island, Cal. 90731
Northern Metal Co., Minor & Bleigh Sts., Philadelphia, Pa. 19136
Peck Equipment Co., 3500 Elm Ave., Portsmouth, Va. 23704
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
Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh, Pa. 15219
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

SHIPBUILDING—Repairs, Maintenance, Drydocking
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Astilleros Espanoles, S.A. Zurbano, 70, Madrid 10, Spain
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150
Beliard Murdoch S. A., Kattendijkdok Westkaai 21, Antwerp, Belgium
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
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Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Dillingham Corp., P.O. Box 3288, Honolulu, Hawaii 96801
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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
Grafton Boat Co., Inc., Grafton, Ill. 62037
Groignard Shipyards, P.O. Box 829 Colbert, Marseilles, France.
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Halter Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126
Harbor Boat Building Co., 258 Cannery St., Terminal Island, Calif.
Havre de Grace, Havre de Grace, Md.
Hillman Barge & Construction Co., Grant Bldg., Pittsburgh 19, Pa.
Hitachi Shipbuilding Co.,25 Nakanoshima2-chomeKitaku,Osaka-Japan
Industrial Steel & Mach. Works, Inc., P.O. Box 2217, Gulfport, Miss. 39501
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
Levingston Shipbuilding Co., P.O. Box 968, Orange, Texas 77630
LISNAVE, P.O. Box 2138, Lisbon, Portugual
Litton Industries, 9920 W. Jefferson Blvd., Culver City, Calif. 90230
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134
Matton Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047
Mitsui Shipbuilding & Eng. Co., Ltd., Nihonbashi-Muromachi, Chuo-ku, Tokyo, Japan
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202
National Steel & Shipbuilding Corp., San Diego, Calif. 92112
Newport News Shipbuilding and Dry Dock Co., Newport News, Va.
Nippon Kokan Kabushiki Kaisha, 2, 1-chome, Otemachi, Chivoda-ku, Tokyo, Japan
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
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Paceco, Div. Fruehauf Corp., P.O. Drawer E, Alameda, Calif. 94501
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Fla. 33156
Perth Amboy Dry Dock Co., Perth Amboy, N.J. 08862
Rodermond Industries, Foot of Henderson St., Jersey City, N.J. 07302
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
Sumitomo Shipbuilding & Machy. Co., Ltd. 2-1 Ohtemachi 2-chome, Chiyoda-ku, Tokyo, Japan
Teledyne Sewart Seacraft, P.O. Box 108, Berwick, La. 70342
Todd Shipyards Corp., 1 Broadway, New York, N.Y. 10004
Transportation Technology, Inc., 3210 Conflans Rd., Irving, Texas 75060
Zigler Shipyards Inc., P.O. Box 492, Jennings, Louisiana 70546

SHIP MODELS
Boucher-Lewis Precision Models, Inc., 36 E. 12 St., N.Y., N.Y. 10003

SHIP MODEL BASIN
Arctec, Inc., 2834 Belair Drive, Bowie, Md. 20715
Hydronautics, Incorporated, Laurel, Maryland 20810

SHIP ROUTING
Bendix Commercial Services Corporation, Owings Mills, Md. 21117
Weather Routing, Inc., 90 Broad Street, New York, N.Y. 10004

SHIP STABILIZERS
Duchess Baker Mfg. Co., Superior, Wis.
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 1010 Third Ave., New York, N.Y. 10021
Maritech, Inc., 38 Union Sq., Somerville, Mass. 02143
John J. McMullen Associates, Inc., 110 Wall St., N.Y., N.Y. 10005
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

STEAM GENERATING EQUIPMENT
Combustion Engineering, Inc., Windsor, Connecticut 06095

STEVEDORING
Luckenbach Steamship Co., 120 Wall Street, New York, N.Y. 10004
M. J. Rudolph Corp., 8 Sackett St., Brooklyn, N.Y. 11231

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TANK CLEANING MACHINES
Pyrate Sales, Inc., 222-17 Northern Blvd., Bayside, N.Y. 11361

TOWING—Lighterage, Transportations, Barge Chartering
American Waterways, 1250 Connecticut Ave., Washington, D.C. 20036
M. J. Batty & Co., P.O. Box 2316, Singapore, 1
Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002
Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202
G & H Towing Company, 509 Texas Building, Galveston, Texas 77550
Henry Gillen's Sons Lighterage, 140 Cedar St., New York, N.Y. 10006
James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004
Jackson Marine Corp., P.O. Box 1087, Aransas Pass, Texas 78336
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
McDonough Marine Service, P.O. Box 26206, New Orleans, La.
P. F. Martin, Inc., Mall Bldg., 325 Chestnut St., Philadelphia, Pa.
Moran Towing & Transportation Co., Inc., 17 Battery Place, New York, N.Y. 10004
L. Smit & Co., 11 Broadway, New York, N.Y. 10004
Suderman & Young Towing Co., 329 World Trade Center, Houston, Texas 77002
M. & J. Tracy, Inc., 1 Broadway, New York, N.Y. 10004
Turecamo Coastal and Harbor Towing Corp., 1752 Shore Parkway, Brooklyn, N.Y. 11214

VALVES AND FITTINGS—Hydraulic—Safety Flanges
Empire Machinery & Supply Co., 3550 Virginia Beach Blvd., Norfolk, Va. 23501
Hubeva Marine Plastics-Lining, 435 Hamilton Ave., Brooklyn, N.Y. 11231
Hydrasearch Co., Inc., Riva Rd., Annapolis, Md. 21401
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Mechanical Marine Co., 45-15 37th St., Long Island City, N.Y. 11101

WINCHES
Skagit Corp., Box 151, Sedro Woolley, Wash. 98284

WIRE ROPE
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., Bethlehem, Pa. 18018
United States Steel Corp., P.O. Box 86, Pittsburgh, Pa. 15230

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