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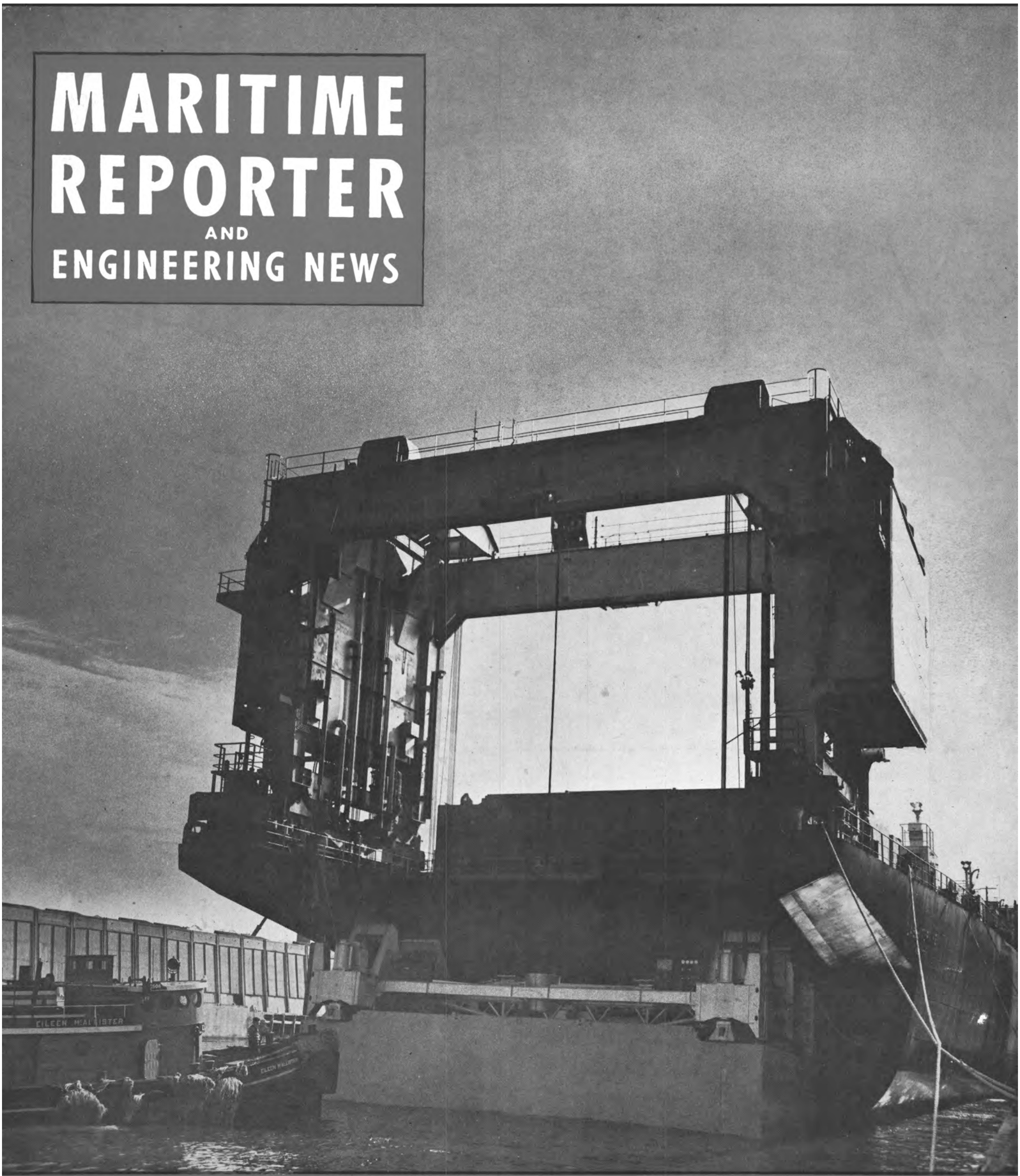
AND
ENGINEERING NEWS

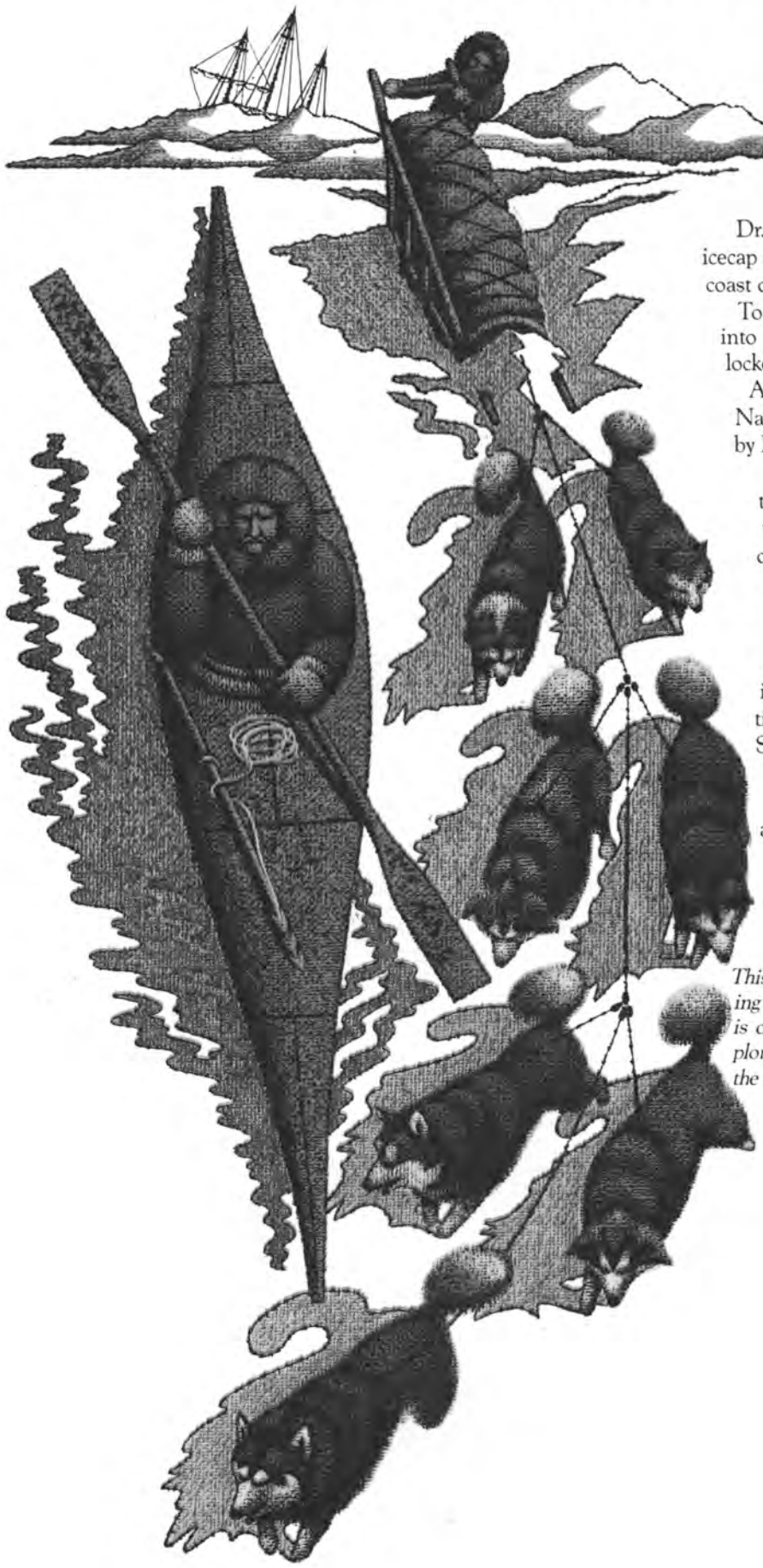


Prudential-Grace Lines' LASH Ships Save Up To 90% Of Time In Ports

(SEE PAGE 7)

APRIL 1, 1971

To the North Pole in 1893.



Dr. Fridtjof Nansen was certain that the polar icecap drifted from the Siberian Arctic to the east coast of Greenland by way of the North Pole.

To prove this thesis, he decided to sail a ship into the icecap and stay with it as it drifted, locked in the ice, across the Pole.

After constructing his ship, the *Fram*, Nansen sailed it into the ice in July 1893 and by December, it was locked in the icecap.

By the spring of 1894, Nansen estimated that, by the way the ship was drifting, it would only get to within four hundred miles of the Pole, so he left it and started out with an associate to complete the journey by dog sled and kayak.

They came within 225 miles of the Pole but then had to turn back because of the immense ice ridges. Their thwarted exploration terminated on Franz Josef Island in the Siberian Arctic.

But.

The *Fram*, meanwhile, had continued on and emerged from the ice north of Spitzbergen on August 13th, 1896, three years after it had entered the icecap.

Nansen's theory had proved correct.

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

Gulf

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

Bids For Ferries Invited By Washington State Highway Commission

Sealed bids for the construction of two alternative designs of passenger and vehicle carrying ferries are to be opened on April 29 by the Washington State Highway Commission. The proposals are to be for the construction of two 440-foot vessels, with an alternate bid for construction of two 384-foot vessels and an alternate bid for the construction of solariums. For $150, the initial plans and specifications can be obtained from the Director of Highways, Highway Administration Building, Olympia, Wash. 98501. Additional sets of the plans may be obtained from Philip F. Spaulding and Associates, 65 Marion Street, Seattle, Wash.

Plans & Specifications Available On USCG's 400-Foot Icebreaker

Bids for the construction of a 400-foot icebreaker will be opened by the U.S. Coast Guard on May 25. Plans and specifications may be obtained from the U.S. Coast Guard Headquarters, Attention: **R. Mordini,** 400 Seventh Street, S.W., Washington, D.C. 20591. The cost per set is $1,000. The solicitation is designated CG-10243-A.

Dravo To Construct Twelve Hopper Barges For Hennepin Towing

Twelve 200-foot-long hopper barges—five feet longer than standard—have been ordered from Dravo Corporation, Pittsburgh, Pa., by Hennepin Towing Company of Minneapolis, Minn.

The vessels will be semi-integrated in design, with one rake end and roll tops. All will be 35-feet wide and 12-feet deep. They will be used for shipment of a variety of bulk commodities.

Pilot Vessel Ordered From Marinette Marine

One 182-foot twin-screw pilot vessel for United New York and New Jersey Sandy Hook Pilots Association is to be built by Marinette Marine Corp., Marinette, Wis. The vessel, to be built at an approximate price of $2.3 million, is slated for delivery in December 1971.

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Program for Construction of 300 New Ships Turns Eyes of Maritime Industry To

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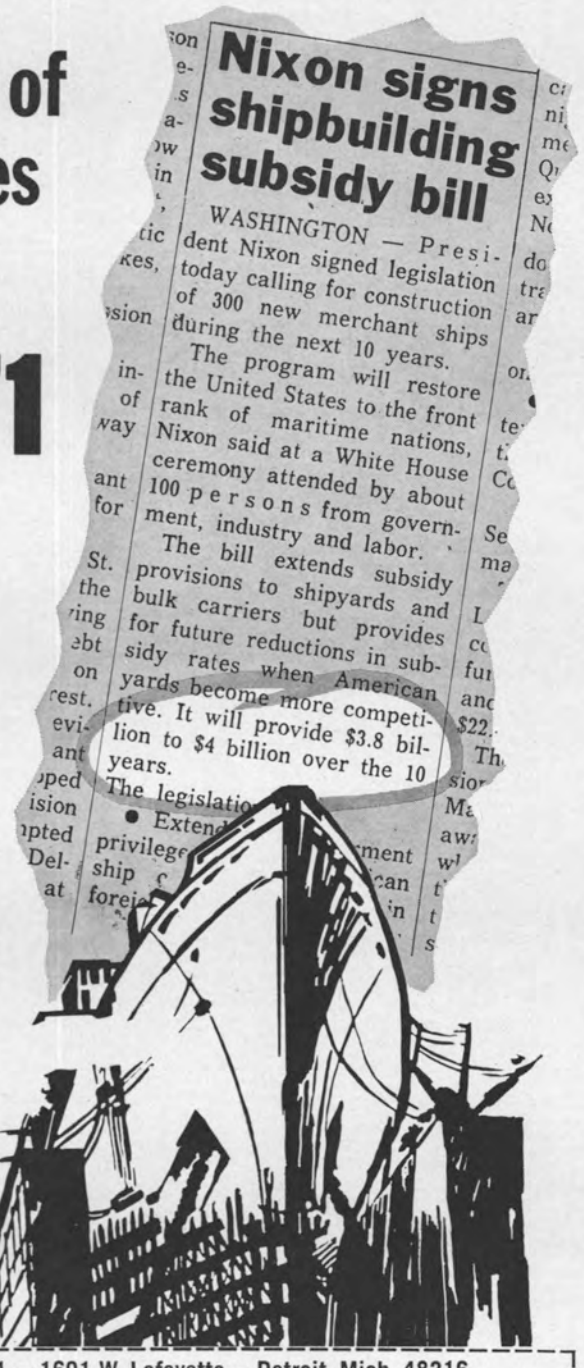

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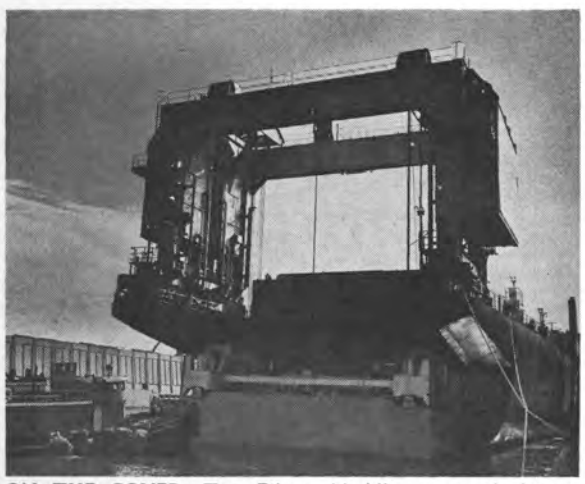
Longshoremen at Bush Terminal, Brooklyn, N.Y., unloading cargo from a lighter that was delivered by the LASH Turkiye.

Prudential-Grace Lines Proves

LASH Ships Save Time



ON THE COVER: Tug Eileen McAllister stands by as 500-ton-capacity crane starts to hoist barge aboard the LASH Turkiye at the Bush Terminal facility.

McAllister Brothers Inc. tug Eileen McAllister shifts LASH lighter at terminal operated by Universal Terminal and Stevedoring Corporation. The tug, originally designed for service on the Erie Barge Canal, has a low silhouette that enables it to work under the cantilever extensions at ship's stern.

Less than a month after the first LASH ship, the LASH Italia, started her maiden voyage, the management of Prudential-Grace Lines has confirmed the original judgment made nine years ago—the LASH system is a time saver. Justifiable pride was expressed on this innovative transportation system by the lines' management as the second LASH ship, the LASH Turkiye, was preparing to sail to the Mediterranean late in February.

While the LASH system is the newest form of intermodal transportation, it represents 18 years of research and development, and design work by the naval architectural firm of Friede & Goldman, Inc. of New Orleans.

Capt. **Adrian Spidle,** vice president for operations, advised a group of port officials aboard the LASH Turkiye while it was loading in New York that the LASH Italia has made spectacular savings of time in port on her maiden voyage through the Mediterranean. On this initial voyage, Captain **Spidle** stated that because of the savings in port time the LASH ship would make a complete voyage to and from the Mediterranean in 37 days instead of the normal 60 days for the conventional ship.

Explaining the operation of the LASH system aboard the LASH Turkiye were, left to right: Capt. **Adrian P. Spidle,** vice president, operations; Capt. **Angelo Carbonella,** ship's master; **Spyros S. Skouras Jr.,** president of Prudential-Grace Lines, and **Sait Sahipoglu,** Turkish consul general in New York City.

Remaining in each port only long enough to drop off some of the 62 lighters in which her cargo was loaded, the LASH Italia was in Barcelona for only eight hours instead of the usual 24; in Leghorn for four hours instead of the usual 24; in Genoa for nine hours instead of two days; in Piraeus for eight hours instead of two days, and in Instanbul for nine hours instead of the usual three days.

The initial operations of the LASH ships will set the stage for expansion of the transportation system which will come about as more ships enter the trade and shippers become acquainted with the operations. Examples of this expansion were given by Col. **J. Edward Meyer Jr.,** vice president for freight sales and marketing. He stated that it is planned to dispatch lighters through the Bosporus in order to extend its operation to Turkish ports which now have little or no service to the United States. This announcement was made after the Turkish consul-general in New York, **Sait Sahipoglu,** who attended the reception aboard the LASH Turkiye, described the new technique as one which could encourage the export of Turkish fruits and other fresh produce to the United States. Prudential-Grace Lines is currently considering equipping some of the lighters for refrigerated cargo.

The shipping line has announced that the

(Continued on page 8)

LASH Ships Save Time—

(Continued from page 7)

lighters will be dispatched to inland river and canal ports for loading and unloading in Europe when the new transportation system is in full operation with five ships in 1972.

Colonel **Meyer** predicted that the LASH ships will be so successful that they will return to the American taxpayers at least twice what they invested in the ship. This statement is based on the fact that subsidized shipping lines return to the government all profits above a specified level.

Spyros S. Skouras, president of Prudential-Grace Lines, expects the LASH ships to attract more cargo than would be expected for conventional ships because of their reduced port time. This saving in time has been given as up to 90 percent. In speaking about the entrance of future LASH ships into the service, he advised that the LASH Espana will sail this month and the other two ships which are on order at Avondale Shipyards will enter service in 1972. According to Mr. **Skouras,** the existing conventional ships in Prudential fleet now serving the Mediterranean will be retired or transferred to other routes. The line operates containerships out of U.S. East Coast ports to Caribbean and West Coast South American ports. These services were acquired in 1969 with the purchase by the then Prudential Line of the 110-year-old Grace Line.

The LASH Italia and LASH Turkiye are the world's largest freighters. The 29,252-dwt ships are 820 feet long and are powered by steam turbines developing 32,000 shp, which give the ships a speed of 22.5 knots in service.

Mr. **Skouras** recognized in 1962 that the LASH system would provide versatility, speed and safety for shippers of all types of general merchandise, odd-size items and partial lots of dry-bulk cargoes. Since then the line has spent millions of dollars pioneering the LASH system. In November 1967 Prudential-Grace Lines placed an order with Avondale Shipyards, New Orleans, for five of these $21 million ships.

McDermott Reorganizes Operations In Gulf Coast

J. Ray McDermott & Co., Inc., New Orleans, La., has announced a reorganization of operations in the Gulf Coast area aimed at streamlining operational functions and responsibilities within the corporate structure.

According to **Roger W. Wilson,** president, the reorganization affects functions in Harvey and Morgan City, La., and is being undertaken to better accommodate the company's overall endeavors, which have become extensive during recent years. The changes, he said, are expected to improve coordination of responsibilities leading toward increased productivity and efficiency of operations.

Several of McDermott's operating groups or departments are being reorganized as divisions of the company. Four of these will be located in Morgan City and four in Harvey.

H.W. Bailey, vice president, will be general manager of the four divisions which make up the Morgan City Division Group. These include the McDermott Fabricators Division, under **W.E. Earles;** McDermott Offshore Division, under **I.R. Foster;** McDermott Shipyard Division, under **V.J. LeBlanc,** and Harvey Supply Company, which will be under the direct management of Bailey with **P.E. Brown** acting as assistant division manager.

The four divisions in Harvey will be under the direction of **L.E. Stewart,** vice president and general manager of the Harvey Division Group. **R.T. Lietz** has been named acting general manager of that group during Mr. **Stewart's** current illness. Divisions in Harvey will include the McDermott Marine Pipeline Division, under **R.T. Lietz;** McDermott Dredging Division, under **W.E. Arnold;** McDermott Inland Service Division, under **H. Ingerman,** and Dick Evans Divers Division, under **R.V. Evans.**

Reporting to **C.L. Graves,** McDermott executive vice president, will be **H.W. Bailey,** vice president and general manager of the Morgan City Division Group; **L.E. Stewart,** vice president and general manager of the Harvey Division Group, and **R.T. Lietz,** acting general manager of the Harvey Division Group.

The McDermott Fabricators Division and the McDermott Shipyard Division will continue to function as in the past with no change. The other new divisions formerly had been departments of the company and one, the Dick Evans Divers Division, is a former subsidiary.

Marine Engineering Systems Moves To Larger Quarters

Marine Engineering Systems, Inc., naval architects and marine engineers, has moved its headquarters to 3700 Buffalo Speedway, Houston, Texas. This was announced by the company's new managers, Dr. **Jack H. Dell** and **David B. Waller.**

Marine Engineering Systems, Inc. has been actively engaged in ship design and structural engineering for the marine transportation and offshore drilling industries for the past two years, and is now expanding its facilities to provide completely computerized ship design, system analysis, and structural analysis services.

NKK's Tsu Yard Delivers 250,000-Dwt Supertanker

The T.G. Shaughnessy, 1,109 feet by 170 feet by 87.6 feet, will be chartered to Gulf Oil Corporation.

The T.G. Shaughnessy, a 250,000-dwt supertanker, has been delivered to Canadian Pacific (Bermuda) Ltd. by the Tsu Yard of Nippon Kokan (NKK), Japan's only integrated shipbuilder-steelmaker.

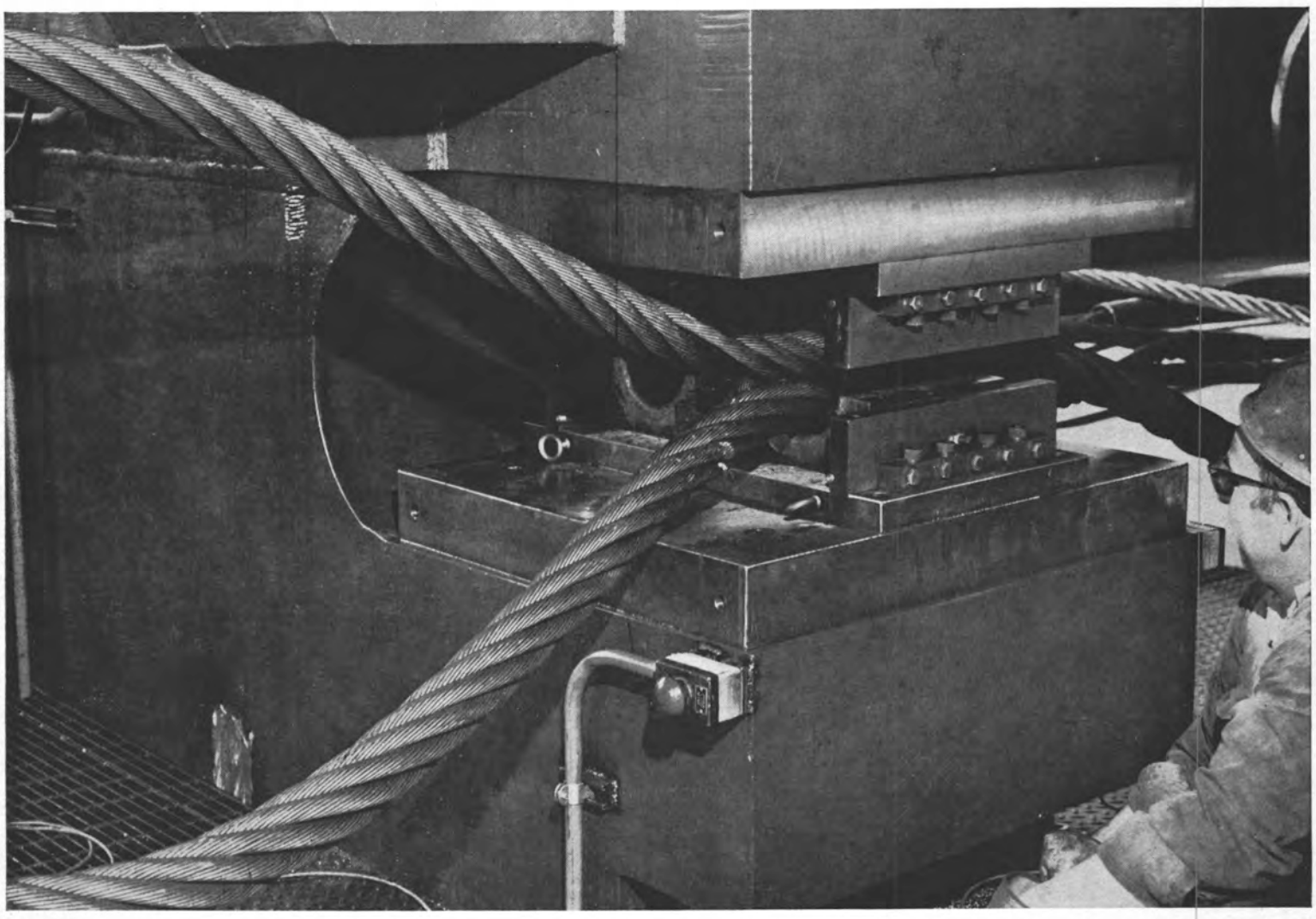
Hiroo Ikematsu, NKK's New York shipbuilding department manager, said the vessel, named after a former chairman of Canadian Pacific, will be chartered to Gulf Oil Corporation, as is her sister ship, the Port Hawkesbury, which was delivered at Tsu last July.

The T.G. Shaughnessy is powered by a B&W 9K98FF engine with an output of 34,200 bhp at 103 rpm, delivering a service speed of 15.5 knots.

Completed in December 1969, the Tsu Yard delivered three ships in 1970, including two 250,000 tankers. Five vessels, totaling 1,015,000-dwt, including the T.G. Shaughnessy, will be delivered in 1971.

Announcing

from Union Wire Rope: big mechanically spliced slings from the world's largest wire rope press



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ARMCO STEEL

A Barge Operator's Views Of Total Distribution

William E. Cleary*

Unlike some other modes of transportation, whose fundamental but basically unsound philosophy is that they want to carry "everything, everywhere, all of the time," the barge industry pragmatically well realizes that its role in the national transportation system is either as a component segment of an intermodal movement; or as a prime mover on a line haul wherein, in both cases, the inherent, and for that matter, the almost sole advantage of water transportation, i.e., its low cost to the shipper, comes into play.

Except for pipeline operation, which is limited as to the commodities compatible to this type of transportation, barge service provides the most economical form of transportation.

The average cost to the shipper on barge freight is 3 mills per ton mile, with a range of 1¾ mills for transportation of large quantities of liquid or dry bulk commodities to 5 mills for lesser quantities or for breakbulk commodities.

By comparison, the average rail per ton mile rate is 15 mills, and the average trucking rate is 6 cents per ton mile.

Barge transportation is, of course, also limited in its ability to serve the shipper, due to the inescapable fact that the vessel must have water under its keel, confining of necessity its service to the waterways as they exist. The rail network and the far-flung system of intrastate and interstate highways give the railcar and the truck access to vast areas untapped by navigable waterways and inaccessible to barge transportation.

This, of course, works to the disadvantage of both the shipper and the ultimate consumer, because other modes of transportation have traditionally practiced the principle of charging "all the traffic will bear," and the absence of waterway competition takes the ceiling right off the rate structure.

Interestingly enough, while the geographical facts of life deprive many areas of the benefits of low cost water transportation, other traffic exists which can and must move only by barge. Oversized

William E. Cleary

machinery, boilers, generators — even nuclear reactors vital to the economy and to the national defense—which are too large or too heavy to be moved by rail or truck are easily accommodated by barge, to the benefit of all concerned.

Additionally, there are some areas, even though limited in number, where barge service is the only source of transportation available. One classic example of this is the servicing of the DEW (Distant Early Warning) line on the northerly edge of the Western Hemisphere, which is vital in the interests of national defense and would be all important as the source of the first warning in the event of an attack by Intercontinental Ballistic Missiles launched by a hostile power. Another example, commercial rather than military, is the almost unbelievably precise movement over the past several years of flotillas of barges carrying thousands of tons of supplies and material from the Puget Sound area on the West Coast to Prudhoe Bay, Alaska, in connection with the setting up of facilities for exploitation of the fabulous newly discovered North Slope oil lands. In both cases, barge service, and barge service alone, could supply the crucial transportation needs for both the military and commercial demands in these areas.

Barges provide approximately 11 percent of total domestic transportation in the United States, with railroads providing 41 percent, trucks 21 percent and pipelines 22 percent.

While this 11 percent figure may not sound too impressive, it must be considered that in 1969, the last year for which official tonnage figures are available, the barge and towing industry, consisting of over 4,000 tugs and towboats with a total horsepower of 3,707,531, and more than 18,000 liquid and dry cargo barges with a total simultaneous lifting capacity of 23,652,441 tons, carried 548,481,358 tons of cargo 187,666,323,000 ton miles on the 25,000 miles of navigable waterways of the United States.

Projections by reliable economists forecast an increase in the total transportation needs in this country of 50 percent over the next decade, and if this projection is anywhere near correct, there is going to be a real transportation "crunch" which will test the capabilities of all forms of transportation.

We submit that very probably barge transportation will be best able to meet this increasing demand for services for two reasons: first, because our vast system of inland waterways is, for the most part, uncongested and amenable to increase in traffic far beyond the capabilities of the jammed highways and trouble-ridden rail system; and secondly, because the healthy economic condition of the barge and towing vessel industry has inspired confidence on the part of the banking fraternity, and the procurement of construction funds by the overwhelming majority of those in the barge industry would appear to present no problem.

The barge industry is presently in the throes of a series of innovative changes, among which is the trend toward giant barges whose carrying capacity exceeds in many cases that of deepsea ships, towed by tugs manned by crews numbering but a fraction of the complement aboard a ship, with of course, significant resultant economies. Then we are also watching closely and with interest the barge-carrying ships of the "LASH" and "SEABEE" type. All of this augurs well for the future of the industry.

We face the future with confidence in the national economy for the long pull, and we stand ready to shoulder the responsibilities which will be thrust upon us in time to come to provide low cost, dependable transportation by barge and towing vessel.

*Mr. **Cleary,** president of The New York Towboat & Harbor Carriers Association, presented the paper reprinted here at the Fifth Annual Conference of The Maritime Management Institute, State University of New York Maritime College, Fort Schuyler, N.Y., which was held on March 2, 1971, at Seamen's Church Institute, New York City. Mr. **Cleary** is also secretary-treasurer of The American Waterways Operators, Inc., the national organization of the barge and towboat industry.

International Shipping Issues Facilities Guide For Taikoo Dockyard

International Shipping Service, 25 Broadway, New York, N.Y. 10004, which represents the Taikoo Dockyards and Engineering Company of Hong Kong, Ltd., Hong Kong, is offering a new ship repair pricing guide and list of facilities manual free for the asking.

According to International's manager, **Robert Bruun,** the yard specializes in repairs and conversion of all vessels up to 10,000 tons deadweight. Special facilities include extensive electrical repair and instrument test facilities of all types. Founded in 1900, Taikoo Dockyard now has a skilled labor force of over 3,500 employees.

Tugmonitor Systems Installed On Five New Panama Canal Tugs

The new tug Jay J. Morrow was placed in service at the Port of Cristobal recently, completing the five-vessel fleet of new automated tugs on the Atlantic side of the Panama Canal.

The Jay J. Morrow is a duplicate of the four other modern type tugs —the Trinidad II; and the Julian L. Schley, the Chester Harding and the Joseph C. Mehaffey, named for former Panama Canal Zone governors. The five tugs placed into Canal service are the smallest but the most powerful tugs owned by the Panama Canal. They are 96 feet in length, 28 feet in width and powered by two 1,500 horsepower engines.

They have full monitoring safety watch and control Tugmonitor systems, supplied by National Marine Service, Inc., St. Louis, Mo. The latter electronically scans the key functions of the main engines, generator sets and auxiliaries. Indicators, alarms, and controls are located in the pilothouse, placing remote control of the engine room at the command of the pilot.

Ashton Barrett Elected FMC Vice Chairman

Helen Delich Bentley, Chairman of the Federal Maritime Commission, has announced the election of **Ashton C. Barrett** as vice chairman. The vice chairman is elected by members of the commission. The choice of Commissioner **Barrett** was unanimous.

This will be Commissioner **Barrett's** third time to serve as vice chairman. In January of 1963, he was elected by his colleagues as Vice Chairman of the Federal Maritime Commission. He was elected to serve as vice chairman again from October 1966, to June 30, 1967.

Mr. **Barrett** is serving a five-year term as Commissioner. This term will expire June 30, 1972.

A native of Gulfport, Miss., Mr. **Barrett** has been active in his state and national party affairs.

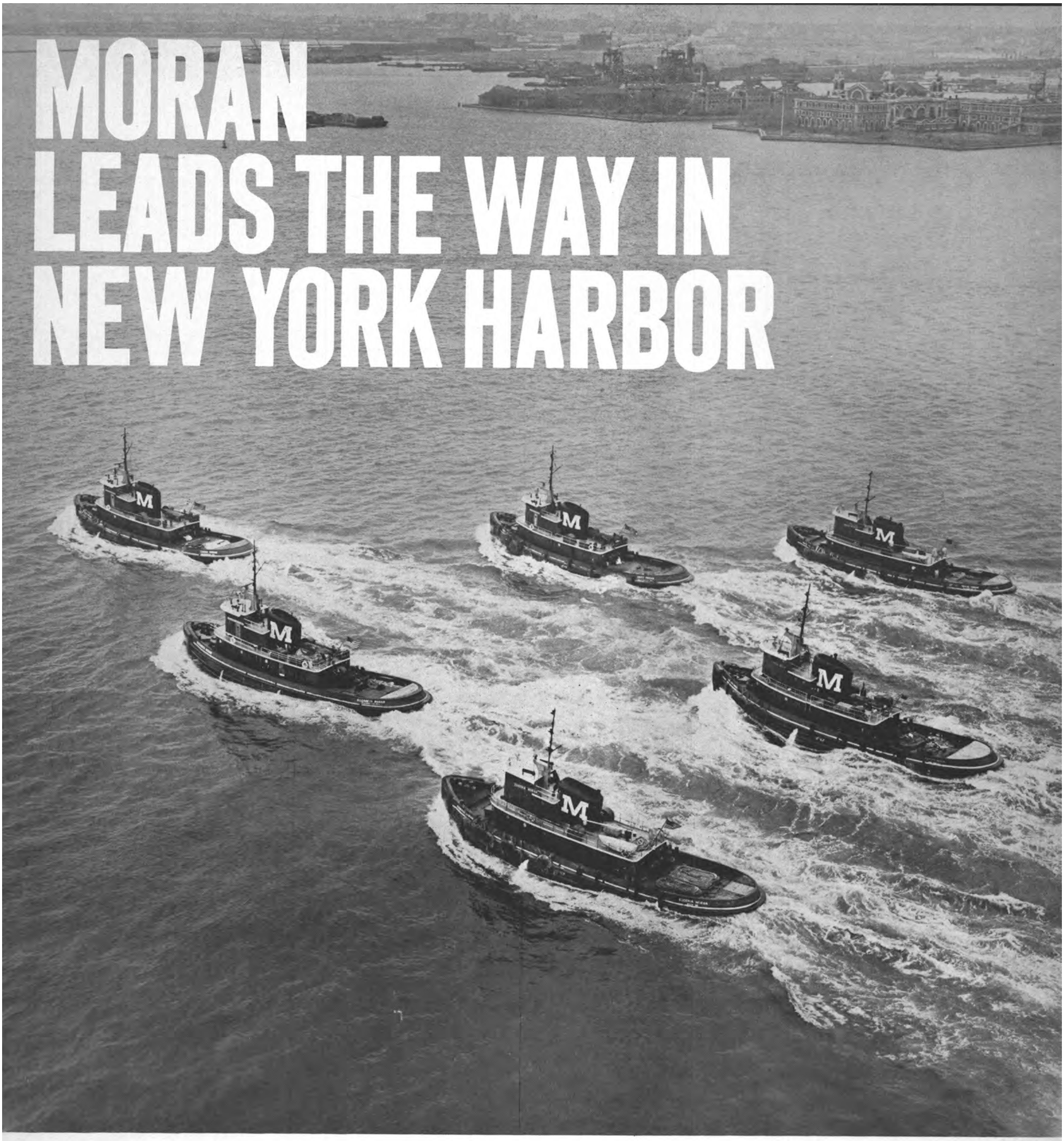
Dravo Appoints Ernst A. Mevissen

Ernst A. Mevissen has been named director of contract services for Dravo Corporation's Engineering Works Division.

Mr. **Mevissen** joined Dravo in 1955 and most recently served as chief engineer in the division's equipment department. In his new post, he will develop and maintain qualified services for the division's products in world markets.

Mr. **Mevissen** attended the Professional Academy of Solingen-Ohligs, Germany, and holds a degree in mechanical engineering from that country's State College.

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



Moran Towing & Transportation Co., Inc., 17 Battery Place, New York, N.Y. 10004

American Ship Building Names Gordon Stafford AmShip Div. President

Gordon Stafford

Gordon Stafford has been named president of the AmShip Division of The American Ship Building Co., it was announced by **George M. Steinbrenner III,** chairman and chief executive officer. Mr. **Stafford** succeeds **Walter J. Knapp,** who has headed the division since its formation nearly three years ago.

Mr. **Stafford,** one of the more popular men in Great Lakes marine circles, has been president of the BIOGEST Division, the corporation's marine technology and pollution control arm. Prior to that, he served as vice president, sales. As president of the AmShip Division, Mr. **Stafford** will head shipbuilding and repair operations at the company's yards in Lorain, Toledo and Chicago.

He began his career with American Ship as a storeroom boy in the old Cleveland yard after graduating from John Marshall High School in 1937. He quickly rose to the position of foreman in the mold loft before being transferred to New Orleans as superintendent for Delta Ship Building Co., a wartime operation staffed by American Ship personnel. There he participated in the construction of 188 Liberty ships, coal colliers and tankers.

After the war, Mr. **Stafford** filled a variety of supervisory assignments for American Ship in both Toledo and Lorain before becoming manager of the Lorain yard in 1954. Three years later he was promoted to assistant to the vice president of operations, and in 1963 was promoted to sales manager. In 1967, Mr. **Stafford** was named vice president, sales, and a year ago, president of the BIOGEST Division.

A veteran of 34 years with the company, Mr. **Stafford** is continuing the family shipbuilding tradition started by his late father, **Charles N. Stafford,** who first joined American Ship as a cabinetmaker in 1910, and remained with the firm for over half a century.

Marine Construction To Build 75-Foot Tug

Puget Sound Freight Lines, Seattle, Wash., has ordered a 75-foot tug from Marine Construction & Design Co., Seattle. The vessel will be powered by a 1,125-hp diesel.

Summer Program On Transportation Systems At M.I.T. August 16-27

Massachusetts Institute of Technology has announced a special two-week summer program on Analysis of Transportation Systems, which Professors **A.S. Lang, E.G. Frankel, M.L. Manheim** and **R.W. Simpson** will be offering August 16 through August 27, 1971.

This special summer program presents the basic concepts and techniques of transportation systems analysis and engineering. Problems of policy, planning, design, and operations will be treated in an integrated manner. The perspective will be multi-modal, with treatment of problems in all modes of transportation, as well as intermodal systems.

Basic concepts and techniques will be covered in the first week. In the second week, case studies will illustrate the application of these concepts and techniques to specific problem areas. Each of the two weeks may be taken separately, or they may be taken as a two-week sequence.

For further information, please write to: Director of the Summer Session, Room E19-356, M.I.T., Cambridge, Mass. 02139.

AEI Appoints Tweed Manager Operations For Inter-Freight, Inc.

Jakob Isbrandtsen, president of American Export Industries, Inc., has announced that **R.S. Lawson,** a senior vice president of American Export Industries, Inc. and president and general manager-operations of Inter-Freight, Inc., the company's freight-distribution subsidiary, has resigned these positions. Mr. **Isbrandtsen** said he was assuming the responsibilities of presidency for Inter-Freight, Inc. and has named **A.F. Tweed** general manager-operations for Inter-Freight, Inc., replacing Mr. **Lawson** in that responsibility.

In his new position, Mr. **Tweed** will be responsible for containership operations and for all domestic subsidiaries, including Eastern Express, Transocean Gateway, National Carloading, R-C Motor Lines and Amexi Leasing Corporation.

Mr. **Tweed** has an extensive background in trucking and containership operations. Prior to joining American Export Industries, Inc. in December 1969, he operated his own firm, Marine Trailers, Inc. Earlier, he was associated with Sea-Land Service, Inc., Watkins Motor Lines and Spector Freight Systems.

Inter-Freight, a subsidiary of American Export Industries, offers a unique freight-distribution service coordinating the complementary transportation services performed by its various subsidiaries and divisions. Included in this system are: American Export Isbrandtsen Lines, Amexi, Container Marine Lines, Eastern Express, Mediterranean Marine Lines, National Carloading Corporation, R-C Motor Lines and Transocean Gateway Corporation. Its worldwide network of 56 ports and terminals complements an oceangoing fleet of 35 container and conventional breakbulk vessels.

Fruehauf Names Quinn Thomas Manager At Norfolk

Quinn D. Thomas

Quinn D. Thomas has been appointed to head Fruehauf's sales, service and parts facility in Norfolk, Va., it was announced by **S.J. Kennard,** vice president, sales-Southeast region.

Active in the transportation industry since 1964, Mr. **Thomas** began his career with Fruehauf as a sales representative in Indianapolis. In the same capacity he was transferred to Charlotte and then to the firm's Roanoke branch. He held the position of assistant branch manager at the Roanoke facility prior to his promotion.

A graduate of the University of Virginia, Mr. **Thomas** holds the rank of lieutenant commander in the Naval Reserve.

Eastern Gas Acquires Chotin Transportation

Eastern Gas and Fuel Associates, Boston, Mass., and Chotin Transportation, Inc., New Orleans, La., have announced consummation of the acquisition by Eastern of the water transportation business of Chotin in exchange for 259,650 shares of Eastern common stock.

Eastern also acquired for an undisclosed amount of cash three smaller affiliates of Chotin: Port Allen Marine Service, Inc., Capital Marine Supply, Inc., and Coastal Towing Corporation.

Chotin operates a barge transportation service on the Mississippi, Ohio, and Illinois waterway systems and along the Gulf Coast. Present officers and employees of Chotin will remain with the business, including **Scott Chotin,** president, and **Edward O'Donnell,** executive vice president.

American Company Awards Multimillion Conversion Contract to Kowloon Docks

Shown during the signing of the contract in the office of Kowloon Docks are, left to right: **I.M. Watson,** manager, Kaiser Cement & Gypsum Corp., Oakland, Calif.; **W.E. Ousterman,** vice president and general manager, Kaiser Cement & Gypsum Corp., Oakland, Calif.; **R.H.A. Lapsley,** estimating department supervisor, Hongkong & Whampoa Dock Co. Ltd., and **M. Caplan,** commercial manager, Hongkong & Whampoa Dock Co. Ltd.

One of the largest conversion contracts ever negotiated in Hong Kong has been concluded recently between Kaiser Cement & Gypsum Corporation, Oakland, Calif., and the Hongkong & Whampoa Dock Co. Ltd., to convert the M/V Orient Carrier (formerly Wakashio Maru) from a log carrier to a bulk cement carrier.

The Orient Carrier is a 6,333-dwt vessel. The arrangement and equipment for handling cement will be very similar to that of the M/V Taipan, another cement carrier owned by Kaiser Cement & Gypsum Corporation, which was repaired at Kowloon Docks during 1970.

Owners will supply all the extensive cement handling equipment for installation. The vessel will have an air slide loading system which will distribute the cement to the self trimming holds. Unloading will also be on the air slide system, discharging the cement into chain conveyors which feed a bucket elevator emptying into pneumatic tanks which pump the cement ashore. The complete operation is handled from a control panel in the pump room and is virtually automatic.

Conversion work will be carried out alongside the Kowloon Docks yard and is expected to take about 16 weeks.

Kowloon Docks is represented in the United States by **Robert M. Catharine Jr.** as sub-agent to United States Navigation Inc.

National River Academy Graduates 34 Tankermen

The National River Academy of the United States of America, Helena, Ark., has graduated a total of 34 students from the waterway industry. Recent classes consisted of experienced river men from the following barge Lines and terminals: American Commercial Barge Line Company, Jeffersonville, Ind.; Igert, Inc., Paducah, Ky.; Ingram Barge Company, New Orleans, La.; A.L. Mechling Barge Lines, Joliet, Ill.; Oil Transport Company, New Orleans, La.; Union Barge Line Corporation, Pittsburgh, Pa.; Upper Mississippi Towing Corporation, Minneapolis, Minn.; Mississippi Coastal Chemical Company, Pascagoula, Miss.; Paymaster Oil Meal Company, Osceola, Ark., and Pine Bluff Terminal Warehouse Company, Pine Bluff, Ark.

The course content primarily covers the training of personnel in the handling of Grade "A" and below grades of liquids, in addition to LFG products. The student becomes familiar with the general arrangement of cargo tanks, suction and discharge pipe lines, valves, cargo pumps, and cargo hoses. Also, he is instructed in the handling of flammable, combustible liquid cargoes, liquid flammable gases, and bulk dangerous cargoes having hazards other than, or in addition to, the conventional flammability and combustibility of petroleum products.

Floyd A. Mechling, president of the board of directors, states that future courses for masters, pilots, mates, engineers, deckhands, etc. will be determined at the annual board of directors meeting.

Tidal Marine Int'l To Buy 20 Dry Cargo Bulk Ships

Tidal Marine International Corp., the New York based international shipping company, has announced plans for the purchase of 20 dry cargo bulk carriers at a cost of about $22.5 million. The company also made known that it has contracted for the construction of three new liquid product carriers, each of approximately 28,500 deadweight tons. Cost of the new tankers will be about $26 million.

According to the announcement, the bulk carrier purchase will increase the dry bulk carrying capacity of the company to 230,000 tons.

It was also stated that about 10 of the bulk vessels will be operated under long-term charter, with the other half to be assigned employment under short-term charter arrangements. Delivery of the vessels is tentatively scheduled to be completed by next summer.

The tankers, to be able to haul up to eight grades of oil, will be delivered during 1972-73. They will be chartered-out on a long-term basis, the announcement states.

Last February, Tidal announced plans to acquire four tankers having an aggregate cargo capacity of nearly 100,000 tons. The four tankers, along with the construction of the three additional ships and the purchase of the 20 bulk carriers, will bring Tidal Marine's fleet to 42 ships having a total capacity of about 750,000 deadweight tons, the company states.

Unload'em fast. Strip'em clean.

Goulds Autoprime pump unloads and strips product tanker and tank barges faster than any pump yet developed. Transfers ballast, bilge and fuel oil more efficiently.

Why?

Because, when operating through a suction manifold system, the Autoprime discharges air or vapors quickly and automatically. And it primes automatically, without auxiliary equipment. Stripping is automatic, complete to the last small amount of cargo—no back flooding or special attention required.

And the Autoprime is built to take punishment, with fabricated steel discharge head, heavy-duty flanged discharge column, oversized 416 stainless steel lineshaft. Balanced impellers and maximum 5-foot bearing span assure vibration-free operation for long life and minimum maintenance.

Read how the Goulds Autoprime pump can help you get to the bottom of things fast and economically. Send coupon today for Bulletin 3A.6.

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Multiply your advantages with compound propulsion systems from Caterpillar

If you need over 2250 horsepower, you need not rely on one big diesel.

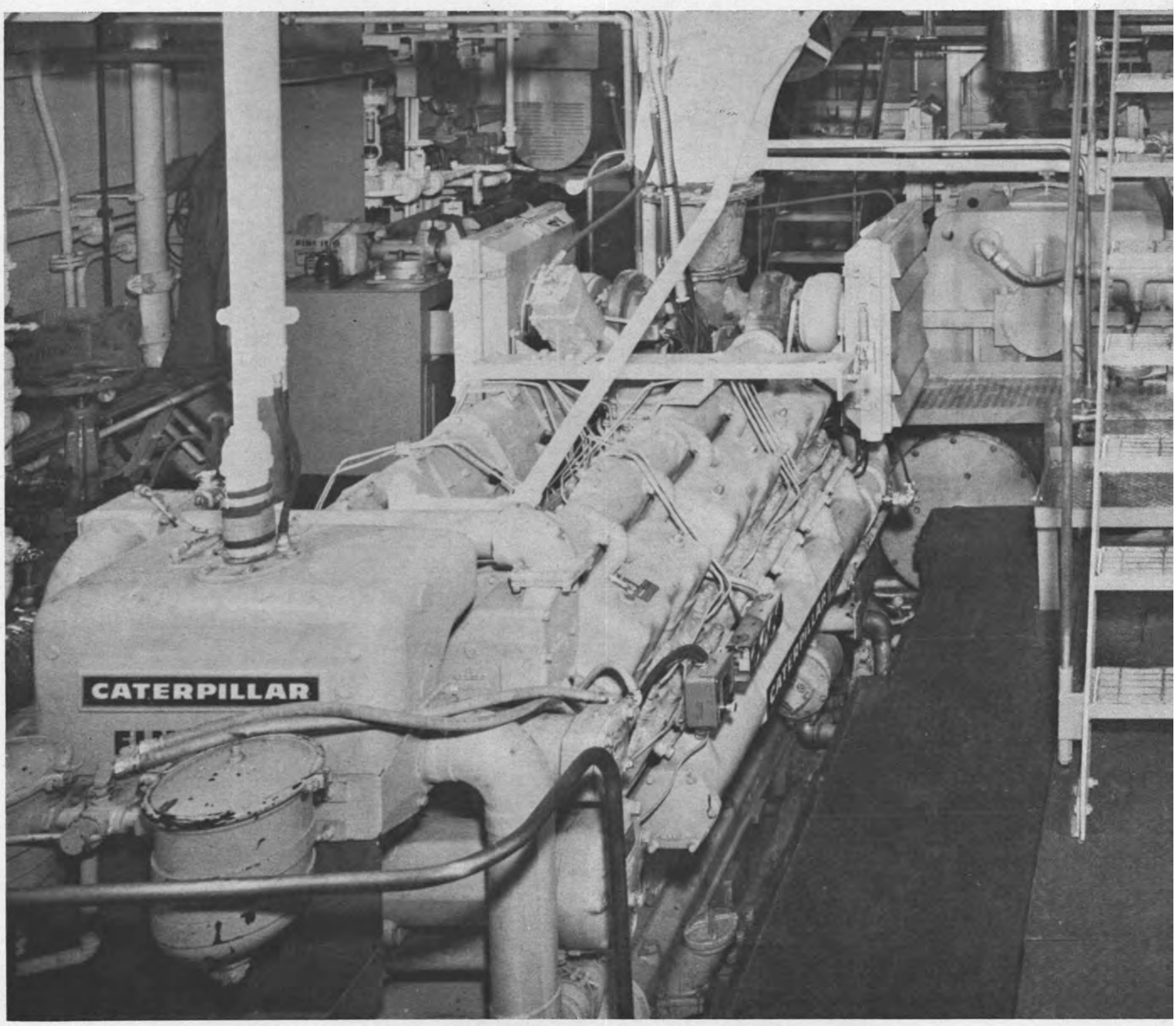
A compound propulsion system incorporating Caterpillar Diesels will multiply your reliability and safety factor and give you economies in power flexibility, too. It gives you the ability to adjust power to the load, reducing fuel consumption and required maintenance.

You might compound Cat Diesels on a single screw. Like the GULF JOAN which has four D398s connected to a Lufkin marine gear. This allows the use of from one to all four engines, depending on the load.

The Cat D398 Diesel Engines each develop 765 hp to give the GULF JOAN a total of 3060 propulsion hp. The 149 ft. tug has a 33 ft. beam and 18 ft. draft. She makes 14 knots light and 10 knots towing a 6000 ton deck cargo barge.

A single lever in the engine room controls all four engines or each can be controlled separately. So the captain has all the power he needs, but can use only the power he needs.

Ship's service aboard the GULF JOAN is supplied by two Cat D333 Diesels driving 75 kw generators. Another Cat



STOP STALLING

...with Fawick's marine propeller shaft brakes

Engine stalling during hard reversing maneuvers are eliminated when Fawick® VC units are used as propeller shaft brakes.

That's just one of the benefits of using these air-actuated brakes which are programmed to engage the moment the shaft is in neutral. Because load on the reversing clutch is greatly reduced, clutch life is extended. Gears, engine and other major components of the propulsion system are subjected to less shock.

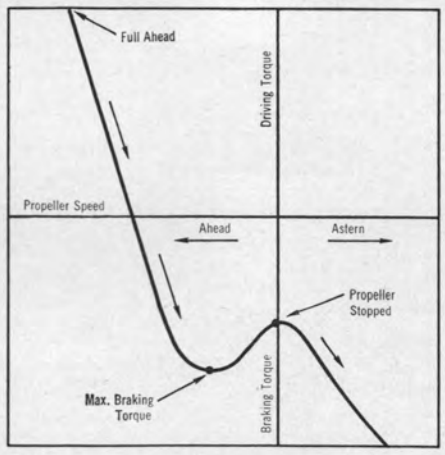
Use of Fawick brakes increases the maneuverability of vessels powered by direct reversing diesel engines. In most applications, the propeller can be stopped in two seconds or less.

Ability to stop the prop quickly reduces the danger of striking damaging debris or fouling the blades in lines or nets. And the brake locks the shaft when in neutral, preventing freewheeling of the propeller in heavy currents — thus protecting marine gears.

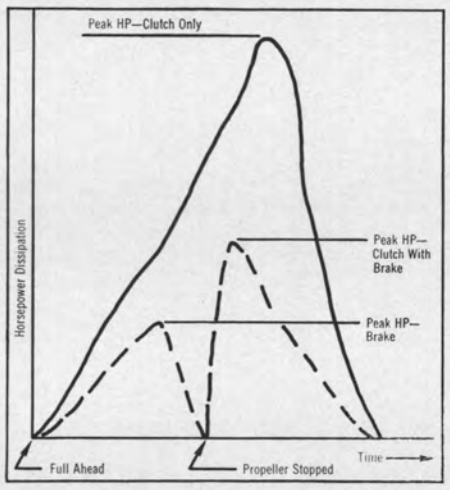
Write Fawick Airflex Division, Eaton Yale & Towne Inc., 9919 Clinton Road, Cleveland, Ohio 44111.

EATON YALE & TOWNE INC.

POWER TRANSMISSION SYSTEMS



The propeller shaft reversing torque curve at maximum speed ahead — generally the operating condition requiring the greatest stopping torque. The brake must have enough torque capacity to pull the propeller speed through the maximum brake torque point and to the propeller stopped point. This torque rarely exceeds 70% of full power torque. After the propeller is stopped, the reversing clutch is engaged and the propeller turned hard in the astern direction to stop the vessel.



This chart compares the heat dissipation required of a reversing clutch through a "crash astern maneuver" and a brake and reverse clutch through the same maneuver. Less total work is needed when the brake/clutch combination is used. Because of this, the peak HP dissipation in the clutch is much less, prolonging clutch life. Also the greatly reduced total "work load" reduces the demand on the engine during reversing, preventing engine stalls and overload and this means the gear and other components are lightly loaded during these maneuvers.

Teledyne Sewart Seacraft Delivers New Turbine-Powered Aluminum Vessel

Powered by a pair of turbine engines, the 65-foot crew boat Jet Star will be used to transport crewmen to offshore oil wells in the Gulf of Mexico.

Teledyne Sewart Seacraft, Berwick, La., one of the world's most experienced builders of high performance boats, in cooperation with Ford Motor Company, announced in New Orleans a revolutionary installation of twin gas turbines in a 65-foot all-aluminum Sewart-built crew boat. The fully air-conditioned T/V Jet Star, built for R.A.G. Boat Contractors, Inc., and outfitted with comfortable aircraft-type reclining seats, is certified by the United States Coast Guard to carry 33 passengers up to 100 miles offshore at speeds up to 26 mph.

The new vessel represents a first-of-a-kind application in the marine industry of a scheduled production model of the remarkable Ford gas turbine. This installation is part of a wide-ranging program for field testing the new turbine engines prior to production. The Jet Star engines are in Ford's 3600 Series, which will be production-rated at 450 horsepower.

Wilson W. Sick, general operations manager of the company's industrial engine and turbine operations, said the marine-engine market is one of the first in which Ford turbines will be sold. "We are extremely pleased with the way this new boat and our engines have taken to each other," he said. "With the turbine's high power-to-weight ratio, plus its inherent lack of vibration and low noise levels, we felt confident that teaming our engines with a first-class hull such as Sewart Seacraft's would turn out to be a winning combination. And it has."

Mr. **Sick** and other Ford officials from Dearborn, Mich., plus officials of Sewart Seacraft, which built the boat, and R.A.G. Boat Contracting Inc., which bought the Jet Star for transporting offshore oil-well crews, were in New Orleans on February 16 for the official presentation and christening of the vessel.

Other Ford turbine prototypes are on test in a diverse range of applications, Mr. **Sick** said. They are installed in construction equipment, oil well servicing rigs, electric generator sets and portable air compressors. In addition, a major pleasure boat builder soon will install a matched pair of prototypes in one of its new cruisers.

Mr. **Sick** also reported that prototype automotive turbines have rolled up more than 250,000 over-the-road miles in Ford's own fleet of parts-carrying trucks and a Continental Trailways bus.

He emphasized that the first engines produced at Toledo will be for industrial and marine use. But, he added, the company has definite plans to produce turbines for trucks and buses in the mid-1970s.

The new Ford industrial and marine engines will be offered in three series, ranging in horsepower from 320 to 525.

The turbine utilizes conventional marine gearboxes and controls, and is responsive to conventional marine throttle control commands. He said it takes no "special training" to operate a turbine boat.

The Ford turbine produces levels of emission that are among the lowest of any existing internal combustion engine.

The president of Teledyne Sewart Seacraft, **Bert Chauvin,** said: "The Jet Star is of particular environmental interest due to the very low level of her engine exhaust emissions. The unique regenerative nature of the Ford turbines is an especially valuable feature in an application such as this vessel, which will transport oil field personnel on the nature-rich waters of south Louisiana. We feel this is a shining example of man's ability to control pollution and aid conservation."

Sewart has a history of successful prototype developments, including advanced military and civilian applications. The Jet Star represents a major breakthrough in efficiency and practical operations.

Dan Sentilles, marketing manager of Teledyne Sewart Seacraft, pointed out some of the outstanding performance characteristics of the vessel, including unusual acceleration ability and smooth quiet operation. He said: "She has a certain quickness unlike similar boats with heavier piston engines. Handling and control functions were easily adapted to utilize our standard throttle, clutch and steering systems. We are extremely proud that our engineering and production abilities have again produced a vessel of such truly exceptional quality."

Future applications, in addition to offshore crew boats, are expected to include United States Navy and Coast Guard patrol boats and a variety of other commercial and pleasure craft.

The presentation of the new vessel took place at the Plimsoll Club in the International Trade Mart, with the actual christening on the Mississippi River at the foot of historic Canal Street.

PACECO Announces Three Promotions

W. Graham Fraser

Chet W. Rensink

Larry A. Wright

Three internal promotions have been announced by PACECO, a division of Fruehauf Corporation, in Alameda, Calif.

W. Graham Fraser has been appointed manager of engineering, from his former position as chief engineer and naval architect; **Chet W. Rensink** moves up to chief engineer, and **Larry A. Wright** becomes assistant chief engineer.

The PACECO promotions will provide increased supervisory personnel for the company's recently expanded engineering department.

Caribe Hydrotrailer To Operate Between San Juan And Miami

Caribe Hydrotrailer Inc., a newly-formed oceangoing carrier based in Puerto Rico, has signed a contract with the Puerto Rico Ports Authority allotting the shipping line the use of marine and terminal facilities at the Isla Grande area in San Juan.

The contract was signed by **Cesar Canals,** executive director of the Ports Authority, and **Leo Collar,** president of Caribe Hydrotrailer. The company has been given five acres of land with an option of acquiring three additional acres of land which will be used for marine and terminal facilities for loading and unloading operations. The cost of construction of the staging area is estimated at $275,000.

With the signing of the contract, Caribe Hydrotrailer plans to launch its roll-on/roll-off barge service on a regularly scheduled basis between San Juan and Miami. The first sailing is scheduled to begin toward the end of this month with an initial shipment of cargo from Miami to San Juan.

Mr. **Collar,** who is also president of the Puget Sound Tug and Barge Co. of Seattle, Wash., parent company of the new shipping firm, said: "I am pleased the contract permits us to inaugurate this new trailership service. It will result in a significant expansion of the Island's trade with the mainland." He paid tribute to Mr. **Canals** and his staff for expediting the arrangements. He said the new shipping line would put into the local service some of the "finest equipment available" in the trade route.

The first barge in the new service is called the Isla Grande. It is 400-feet in length and 100-feet wide, with a carrying capacity of 90 forty-foot highway trailers. Initially, the service will be on a schedule of every 10 days, with the introduction of additional equipment as demands warrant.

The Isla Grande is described as the largest flat deck barge in the world. The company owns four more similar barges. The barge itself is towed by a modern oceangoing tug with a 3,500-hp capacity.

It has already been disclosed that **Bob Leith,** a veteran shipping consultant, had been named vice president of Caribe Hydrotrailer, and will coordinate all sales and operations activities of the line in San Juan.

The parent company does an annual barge and tug business estimated at $50 million, mainly in the Alaska trade.

Bailey Meter Company Appoints R.A.C. Staples

R.A.C. Staples

R.A.C. Staples has been appointed product manager, digital systems, at Bailey Meter Company, Wickliffe, Ohio. Mr. **Staples** will coordinate marketing, engineering design, industrial engineering, and manufacturing activities among departments.

Since first joining Bailey in 1959, Mr. **Staples** has acquired an extensive background in the digital systems field. He has held several positions, including applications engineer and manager, digital systems marketing. His previous position was product manager, small computer project, the result of which was the development of the 855/15 computer for process applications.

Mr. **Staples** earned a B.S.E.E. degree from the University of New Brunswick and an M.B.A. certificate from McGill University. He is the author of several technical papers and is a member of the Professional Engineers Society.

A subsidiary of Babcock & Wilcox, Bailey Meter Company is a leading manufacturer of instrumentation and control and computer systems for power plant, industrial process, and marine automation.

Steuart Receives MSB Approval In Principle For Three Tankers

The Maritime Subsidy Board has approved in principle an application from Steuart Investment Company, Piney Point, Md., for a construction subsidy to aid in the building of three 78,000-dwt tankers.

Newport News Shipbuilding and Dry Dock Company, Newport News, Va., will construct the tankers at a total cost of $68.25 million.

The ships, which will carry heating and industrial fuel oil from Curacao to Steuart's petroleum terminal on the Potomac River at Piney Point, Md., represent the first new construction award under the 1970 Merchant Marine Act since its signing last October. They are also the first ships to be procured through the negotiated bidding process authorized by the new bill.

According to **William B. Ewers,** general maritime counsel for Steuart, when the three ships are in service, they will almost entirely eliminate the 53 voyages per year which foreign vessels have made to Piney Point. One of the chief reasons for the new maritime program has been to increase the amount of American foreign trade carried in United States ships.

Master Contracting Stevedore Association Elects Redlich Pres.

C.R. Redlich

C.R. Redlich, president of Marine Terminals Corporation of San Francisco, has been elected president of the Master Contracting Stevedore Association of the Pacific Coast. He succeeds **George Schirmer,** board chairman of the California Stevedore & Ballast Co., who served as the association's president for the past 10 years.

Other officers of the MCSA elected at the group's 10th annual membership meeting held at Pebble Beach, Calif., on March 7, were: first vice president, **J.C. Hering,** chairman of W.J. Jones & Son, Inc. of Portland; second vice president, **Clayton R. Jones,** president of Jones-Rothschild of Portland; third vice president, **John A. Hyland,** president of Crescent Wharf & Warehouse Co. of Wilmington, Calif.; fourth vice president, **Chester Eschen Jr.,** president of California Stevedore & Ballast Co. of San Francisco; treasurer, **William G. Fahy Jr.,** secretary-treasurer of the San Francisco Stevedoring Co., Inc.

Newly elected as directors of the association, in addition to Mr. **Jones,** Mr. **Eschen,** Mr. **Hering** and Mr. **Hyland,** were: **Fred R. Smith,** president of the Seattle Stevedoring Co.; **Neil Whisnant,** president of Brady-Hamilton Stevedore Co. of Portland; **Leslie M. Westfall,** president of Westfall Stevedore Co. of Eureka, Calif., and Capt. **John H. Anthony,** president of Metropolitan Stevedore Co. of Wilmington, Calif.

Marine Square Club To Hold Annual Dinner In New York April 17

The Marine Square Club, Incorporated, announces its 43rd Annual Dinner-Dance to be held on Saturday, April 17, 1971 in the Grand Ballroom of the Hotel Commodore, 42nd Street and Lexington Avenue, New York City.

A reception is scheduled for 7:30 p.m., with dinner following at 8:30 p.m. Dress is formal. The charge of $22.50 per couvert includes gratuity.

Checks should be made payable to Marine Square Club, Inc., and mailed to **George M. Huff,** P.O. Box 52, Bayonne, N.J. 07002.

The net proceeds for this dinner-dance will be given to the scholarship fund of the New York State Maritime College.

Colt Industries Pump Division Names C.C. Brown

Charles C. Brown

Charles C. Brown has been appointed marketing manager, Government and marine markets, by Colt Industries Pump Division, Kansas City, Kan. The announcement was made by **Jack D. Nommensen,** director of marketing.

Mr. **Brown** is responsible for sales of the Fairbanks Morse pump line to the Government and marine market areas. Prior to this, he was manager, sales engineering. He came to the division from the large pump section of Colt, Power Systems Division in Beloit, Wis., where he held posts of manager of product sales, and chief application engineer.

Mr. **Brown** was graduated from the University of South Dakota, where he received his degree in mechanical engineering.

Smit-Lloyd N.V. Names Nedlloyd As Agents

Smit-Lloyd N.V., Rotterdam, has announced the appointment of Nedlloyd Inc., 30 Church Street, New York, N.Y. as their agents, effective March 15, 1971. This representation was formerly held by Phs. van Ommeren Shipping (USA) Inc. of New York.

Smit-Lloyd are widely-known for their steadily expanding fleet of supply vessels, servicing among others the oil industry in their offshore drilling activities throughout the world.

GOLDEN GATER HONORED: A maritime leader was recently singled out by the maritime industry in San Francisco for special recognition. **Robert E. Mayer** (right), president of the Marine Exchange in 1968-69 (and Pacific Coast sales manager for Todd Shipyards Corp.), received an engraved, chiming ship's clock for his "outstanding services to the region's commerce." **Chris Blom** (left), Exchange president and head of Overseas Shipping Co., San Francisco, made the presentation at a recent World Trade Club ceremony.

JSBL Gets Order From Neptune Orient For 2 Freedom Ships

Jurong Shipbuilders Private Ltd. (JSBL), a joint venture company between IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.) of Japan, the Singapore Government, and the Jurong Shipyard Ltd., recently received its first order for two 14,800-dwt Freedom vessels. Ordered by Neptune Orient Lines, Singapore's national shipping line, the ships will be named Neptune Ruby and Neptune Opal. Delivery is slated for August and December 1972, respectively. Following this order, JSBL has received more than 14 inquiries from all over the world.

JSBL was established in December 1968, and the foundation ceremony was held on March 28, 1970. Under a crash construction program, keel-laying of the first ship is scheduled for July 1971. Almost all piling work of the dock is completed; more than half the concreting of the dock wall and the dock bottom is finished, and 45 percent of the pump room and wing abutment is completed. The dock entrance will be finished this month and all the work on the building dock should be completed by the end of October.

Sumitomo Launches Passenger/Vehicle Ferry —Lays Keel For Another

Sumitomo Shipbuilding & Machinery Co., Ltd., recently launched the M/V Central No. 2, a 5,900-gt long haul passenger/vehicle ferry for Central Ferry Co., Ltd., at its Uraga shipbuilding yard in Yokosuka. **Miss Masako Iuye,** daughter of **Yuroh Iuye,** president of Central Ferry, served as sponsor during the christening.

Due to the overcrowded situation of road traffic, the Central No. 2 can transport many cars faster and safer over a long distance. The vessel is capable of transporting 560 passengers and can load about 130 eight-ton capacity trucks on board by the RO-RO system.

The ferry has a length between perpendiculars of 387 feet, a molded breadth of 72 feet and a molded depth of 41 feet. She is powered by two Kawasaki-MAN V7V 40-54 diesels, each with a maximum continuous rating of 7,500 hp at 225 rpm. The vessel is equipped with controllable pitch propellers, side thruster and fin stabilizers.

Upon completion, which is scheduled for the end of next month, the Central No. 2 will sail between Tokyo and Kobe in 20 hours with a service speed of 19.5 knots.

Sumitomo also laid the keel for another passenger/vehicle ferry for Central Ferry Co., Ltd., on February 25, the date of launching for her sistership, the Central No. 2.

Port Of Felixstowe Reports Increase In Container Tonnage

The United Kingdom port of Felixstowe reported that during 1970 the port handled 2,259,981 tons of cargo, exceeding the two-million-ton mark for the first time in its history. This was an increase of 272,511 tons over 1969.

Of the 1970 total, 1,440,014 tons were imports and 819,967 tons were exports. The number of containers handled during the year amounted to 93,099, an increase of 19,066 over the previous year.

Shipbuilders Council Marks Fiftieth Anniversary —Edwin M. Hood Reelected Board Chairman

Edwin M. Hood was reelected chairman of the board of directors of the Shipbuilders Council of America at the organization's 50th Annual Meeting, held on March 3 in Washington, D.C. Mr. **Hood** will continue to serve as president and chief executive officer of the Council, a position he has held for the past 10 years.

Edwin M. Hood

In his annual report to the membership Mr. **Hood** stated: "The U.S. shipyard industry experienced a somewhat 'slow track' during the first year of the 1970 decade, with every expectation that the pace of activity will substantially accelerate in 1971 and thereafter."

Mr. **Hood** said that shipbuilding in the national scheme of things is now receiving the "bright spotlight of public and Government attention. The Congress has deplored the infirmities of age and inadequacy which are ascribed to U.S. sea power" wherein nearly three quarters of the American merchant marine and about half of the U.S. Navy fleet is composed of ships 20 years of age or older. Deliveries of new ships have not been sufficient to overcome the high degree of obsolescence which has afflicted our Navy and maritime fleets, but "obsolescence is only part of the picture," he said. "The continuing demands on U.S. naval forces throughout the world, the sharp decline in the volume of cargoes carried by American-flag shipping, rapid technological progress in the U.S. as well as abroad, Russia's expanding presence on the oceans, the need for modern ships—these reasons, and more," he stated, "have underscored the urgency of a well-structured rational and coordinated shipbuilding program.

"All signs continue to point to a total shipbuilding market for American shipyards and American ship component manufacturers in the 1970 decade of more than $50 billion," Mr. **Hood** noted. He said the proposed 300 merchant ships under the 1970 Merchant Marine Act valued at $6-billion, the estimate of up to $5-billion for naval ship construction annually to modernize the Navy, an unspecified number of deepwater tankers for the movement of North Slope crude oil from Alaska to domestic refineries, are major ship construction programs in the 1970s.

These prospects, however, are "in the offing," he said, adding that the initial impact of the Nixon maritime program will not be felt in the shipyards until mid-1972, or perhaps later; and for the next five years, a large share of funds for naval ship construction will be devoted to programs now underway, limiting "it would seem" new bidding opportunities.

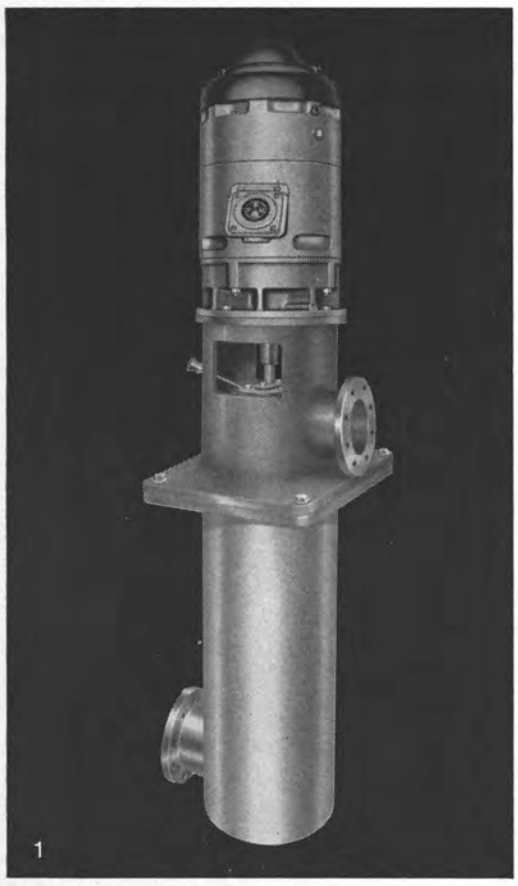
Mr. **Hood** said ship repair work in 1970 decreased, and shipyard employment declined as old naval and merchant ships were retrieved. He said unused capacity for shipbuilding and repair work was available in all sections of the country and shipyards are "energetically soliciting additonal shipbuilding, ship repairing and conversion contracts. The shipyard industry of the United States thus faces the enigma of a near-term debility and a long-term euphoria. 'Getting from here to there' will not be without problems, but shipyard managements have not abandoned the unprecedented sense of optimism which ushered in the 1970 decade," Mr. **Hood** stated.

The following industry officials were elected as regional vice presidents of the Shipbuilders Council in the annual election: East Coast —**John L. Roper II,** Norfolk Shipbuilding and Dry Dock Co.; West Coast—**John V. Banks,** National Steel and Shipbuilding Co.; Gulf Coast—**Otho H. Haunschild,** Levingston Shipbuilding Co.; Great Lakes — **Thomas J. Defoe,** Defoe Shipbuilding Company. **Mrs. Beverly C. Kendall** and **Edward P. Ruddy** were reelected treasurer and secretary of the Council, respectively.

At the luncheon following the board meeting of the Council, the Honorable **Helen Delich Bentley,** Chairman of the Maritime Commission, spoke to Council members and guests.

MATSON CITED: The award to Matson Navigation Company as "Industrial Engineering Company of the Year" is presented to Matson's president **Malcolm H. Blaisdell,** left, by **Ross W. Hanson** of the American Institute of Industrial Engineers, San Francisco-Oakland Chapter. The award cites industrial engineering excellence and outstanding support of principles of the American Institute of Industrial Engineering for 1970.

Fairbanks Morse marine pumps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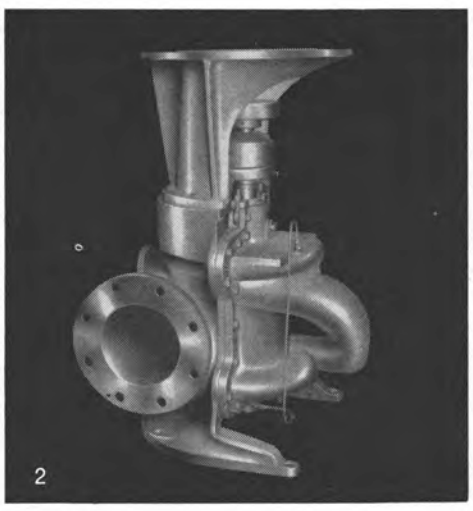
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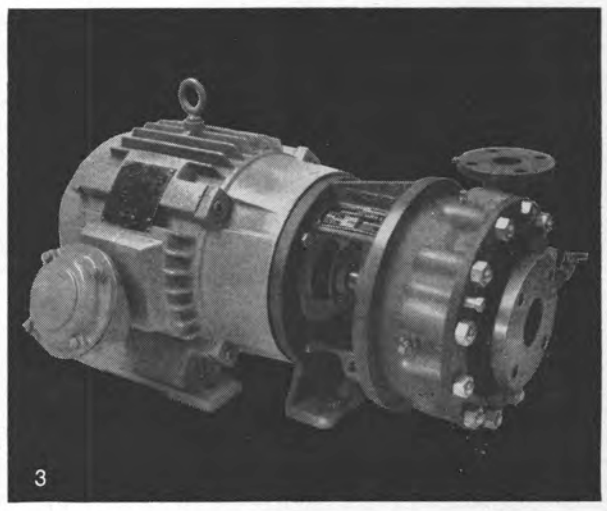
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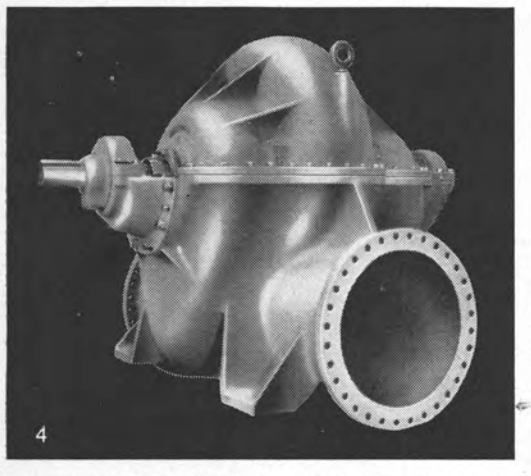
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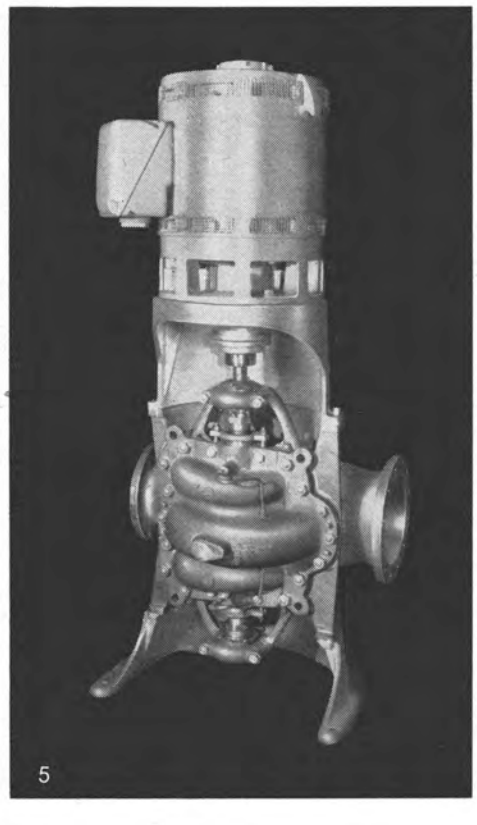

5

1. **Vertical Turbine**—Available in deck-mounted or canned types. Capacities to 25,000 G.P.M. Sizes to 36″. Working pressures to 250 p.s.i.
2. **Vertical Single Suction**—Single or two stage construction. Capacities to 750 G.P.M. Sizes through 4″. Working pressure 125 p.s.i.
3. **End Suction**—In Biltogether or frame mounted models. Capacities to 2400 G.P.M. Sizes to 8″. Working pressures to 250 p.s.i.
4. **Horizontal Double Suction**—Single or multi-stage construction. Capacities to 14,000 G.P.M. Sizes 2″ to 20″. Working pressures 175 p.s.i.
5. **Vertical Double Suction**—Single or multi-stage construction. Capacities to 14,000 G.P.M. Sizes 2″ to 20″. Working pressures to 175 p.s.i.

For complete information on these and other Fairbanks Morse Marine Pumps for shipboard and drydock service, contact your nearby representative or write our Pump Division, 3601 Kansas Avenue, Kansas City, Kansas 66110.

Colt Industries

KNOWN 'ROUND THE WORLD

THE BOSTON METALS CO.

313 E. BALTIMORE ST. • BALTIMORE 2, MD.

Main Office: LExington 9-1900 • Marine Dept.: ELgin 5-5050

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.

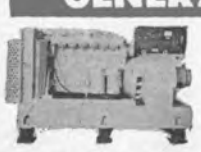
7

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

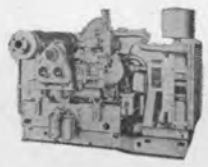
60 KW — 440/3/60 — 1200 RPM—with switchgear.

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

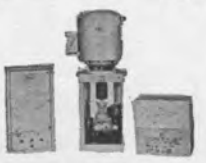
PUMPS

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

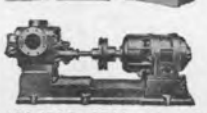
Rotary—50 GPM—50 lbs.—2"—5 HP—440/3/60—with starter & spares.

28

UNUSED BLACKMER VERTICAL ROTARY PUMP

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

29



KINNEY MOLASSES PUMP

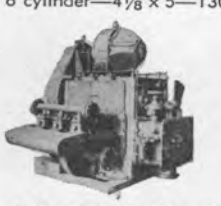
430/215 GPM—size 8x8—pressure 60 lbs.—142/280 RPM. Motor RPM 875/1750. Falk 6.25:1 reducer. G.E. 30/15 HP motor.

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.

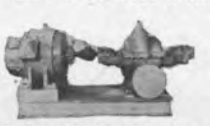
31



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

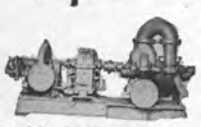
Terry Turbine—BM—273 HP—550 RPM—exhaust 15 lbs—590 PSI—superheat 0°—425 GPM Buffalo Pump—discharge pressure 750 lbs.—5" x 4"—built for USN DD destroyers.

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

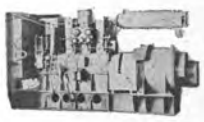
15 HP—220/440/3/60—3000 lbs @ 100 FPM. Gypsy 8"—waterproof box—floorplate.

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

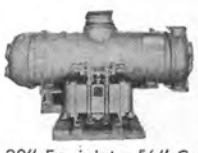
Two stage—135 CFM—7" x 6¼" x 5"—110 lbs.—870 RPM—inner cooler. MOTOR: Allis-Chalmers 40 HP — 230 VDC — 145 amps — 1750 RPM — Model EB121.

57

GRISCOM-RUSSEL EVAPORATOR

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

58



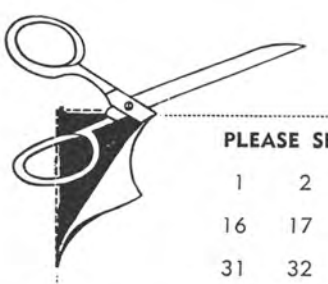
UNUSED 1135 SQ. FT. C.H. WHEELER CONDENSER

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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46	47	48	49	50	51	52	53	54	55	56	57	58	59	

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

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

Bailey To Automate Three Converted Ships At AmShip Lorain Yard

Baily Meter Company, Wickliffe, Ohio, has received an order from the American Shipbuilding Company to automate the power boilers of the S/S Detroit Edison, the S/S John J. Boland, and the S/S Adam Cornelius of the Boland and Cornelius Steamship Company.

The conversion of these three ships will be done by the American Shipbuilding Company at their Lorain Shipyard. The three ships are being converted from coal to oil-firing using Babcock & Wilcox Racer Type Steam Atomizing Burners. Each ship will have two boilers with two burners per boiler.

Included in the contract is a Bailey MINI-LINE Pneumatic Control System for combustion and feedwater control, and the new Bailey 762 Digital Burner Management System. Control consoles will also be provided for location in the engine room and in the boiler room.

The analog and digital control systems will be furnished as a completely integrated automatic boiler control system which will permit operation of either or both boilers by automatic, remote, or local manual modes of control.

A subsidiary of Babcock & Wilcox, Bailey Meter Company is a leading manufacturer of instrumentation, control computers and systems for power plant, industrial process, and marine automation. Since 1964, Bailey has provided boiler control systems for over 160 ships, including complete engine room automation for the first steamship certified by the U.S. Coast Guard for operation without a fireman.

Electro-Nav Inc. Formed In New York

Robert E. Negron

Robert E. Negron, formerly ITT Decca Marine sales manager, and well known for many years in the marine electronics field, announces the formation of Electro-Nav Inc.

Electro-Nav will act as a manufacturer's representative for ITT Decca Marine Products and as area representatives for Collins Radios, Elac Depth Sounders, Marine Digital Systems, and other leading manufacturers of electronic navigation equipment.

The equipment offered is highlighted by the Decca series of solid state radars, a unique Collins VHF/FM radiotelephone and the MDS computer aided collision avoidance system. A Safe walkie-talkie for tankers and shipyards is also offered on behalf of Micro-Communications.

Electro-Nav Inc. can arrange supply of their advanced marine products and assist in putting together complete packages and systems to meet the special requirements of each work boat and shipowner.

Electro-Nav Inc. will make its headquarters at 555 Fifth Avenue (8th Floor), New York, N.Y. For further information write Electro-Nav Inc., P.O. Box 5248, Grand Central Station, New York, N.Y., or telephone **Robert Negron,** (212) 490-1833.

Two Canadian Firms Developing Prototypes Of Air-Cushion Craft

Bell Aerospace, which is working in partnership with the Canadian Government in Ottawa, and United Aircraft of Canada, Ltd., are playing major roles in developing two prototypes of an air-cushion craft that will be able to carry a 25-ton payload.

The vessels are to be designed for use in the Canadian Arctic. Their aluminum structures will be Canadian, while their propellers will be made in the United States. The prototypes will be developed in a plant Bell is building in Ontario, while the turbine engines for the vessels will be provided by United Aircraft.

Seatrain Lines Reports Increase In Revenues

Revenues of Seatrain Lines, Inc. for the six months ended December 31, 1970, rose 68 percent to $76,617,000 from $45,619,000 in the first half of fiscal 1970.

Because of continued start-up problems and accelerating longshore costs in Seatrain's new North Atlantic containership trade, earnings from operations declined to $6,532,000, or $.48 per share, from $8,418,000, or $.62 per share, in the comparable period a year earlier. An extraordinary charge of $437,000 on the sale of vessels trimmed $.03 per share from the six-month earnings in the current year.

Seatrain president **Howard M. Pack** said that the container division's move from Edgewater, N.J., into new headquarters at Port Seatrain in Weehawken, and a slight increase in North Atlantic container rates beginning in January, were "finally beginning to produce some improvement in the company's containership segment." He noted that Seatrain vessels have been running at a high percent of capacity in all container trades this year. Based upon a competitor's application for a substantial increase in rates in the Hawaii trade, and Seatrain's expected bid for higher rates in the Puerto Rico service, "We anticipate a better return in both trades," he said. "There is already a modest improvement in our average revenue per container in the North Atlantic since the end of the second quarter."

Mr. **Pack** said a number of other factors promised substantial improvements in operations beginning during the fourth quarter of the current fiscal year. Seatrain is scheduled then to have in service the first of four new high-speed turbine containerships which will improve efficiency in the North Atlantic run. In a move to accelerate improved efficiency in the containership segment, the company is also considering a move to charter several additional new vessels for the European service. This would permit transferring a number of more efficient vessels presently in that trade to the Puerto Rico service, the transfer of an additional ship to the Hawaii-Guam trade, and the retirement of several older ships.

The very satisfactory results in Seatrain's charter operations will improve still further, the company spokesman said. Beginning this summer, as several tankers complete current voyages and start new long-term charters at substantially higher rates, the company's charter segment will contribute increasingly to revenues and earnings through 1973.

PFEL Elects Meeske VP-South Pacific

William F. Meeske has been elected vice president-South Pacific territory for the Pacific Far East Line, Inc., San Francisco, Calif., it was announced by PFEL president **Leo C. Ross.**

A native Californian, Mr. **Meeske** will have responsibility for PFEL freight and passenger operations throughout the South Pacific, and will work from offices in Sydney, Australia. Previously, he was vice president in charge of Matson Navigation Company's South Pacific operations, and had been with Matson since 1939.

In his new position with PFEL, Mr. **Meeske** will have responsibility for the South Pacific operations of the passenger liners S/S Mariposa and S/S Monterey, as well as freighter vessels which ply the trade route.

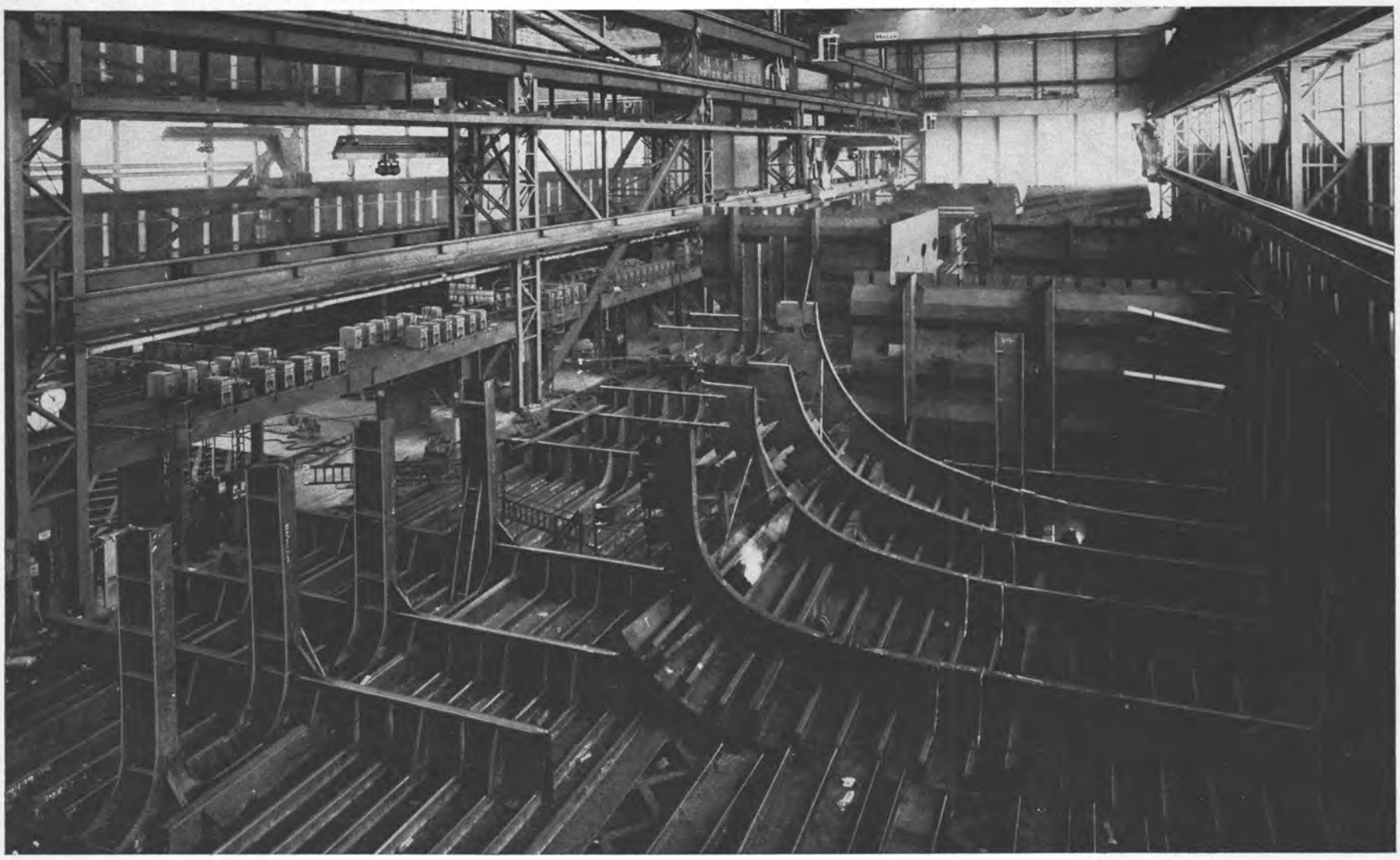
Mr. **Meeske** is a graduate of the University of California and completed postgraduate work at Columbia University Graduate School of Business.

Scottish Yard Launches 16,000 Hp Tugboat

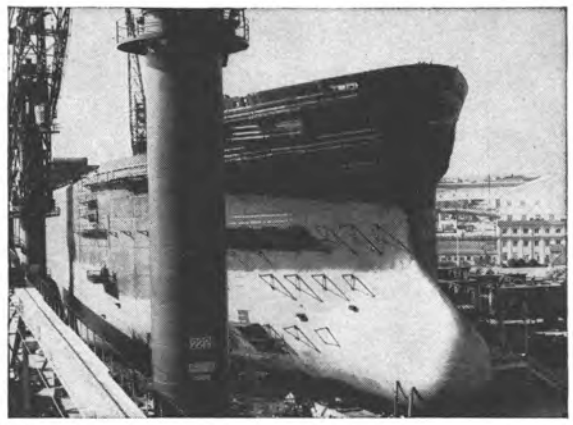
The most powerful tug ever built for a British owner has been launched at Leith, Scotland, by the Robb Caledon shipyard,

The 16,000 horsepower tugboat, named Lloydsman, is capable of towing a 300,000 deadweight ton oil tanker at a speed of seven knots, the builders claim.

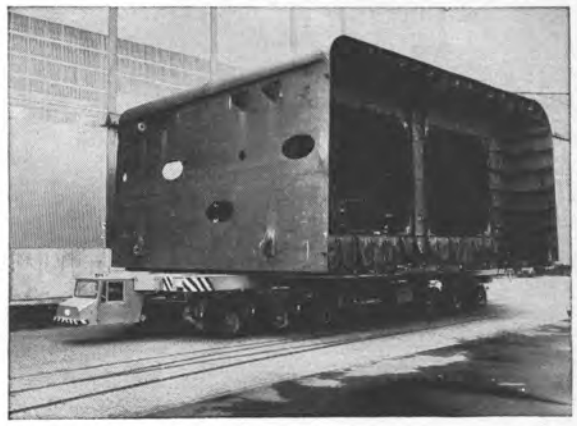
The Lloydsman was built at a cost of $2.4 million for the United Towing Co., Hull, England. She will be the company's new flagship.



Indoor shipbuilding. Large sections, some weighing 120 tons, are prefabricated in this new hall of over 100,000 sq. ft. A specially designed truck moves welded sections from hall to slipway.



A 100,000-ton OBO ship nears completion. The hull has been assembled from the prefabricated sections welded indoors. This method of construction cuts ship's time on the slipway by half.



This self-propelling truck, with lifting platform and 48 self-aligning wheels worked by hydraulic power, is the largest of its kind in Sweden. It moves 150-ton loads from prefabrication hall to slipway.

Modern Öresund Shipyard

New Prefabrication Hall for 100,000-ton Ships

Production is highly mechanized at the Öresund Yard and the prefabrication principle fully utilized in the new hall. The hall is used for welding, and large hull-sections are also built indoors. The hall temperature is controlled and welding smoke reduced by efficient heating and ventilating systems. The improved working conditions are reflected in the higher standard of production. Today, modern Öresund Shipyard builds still better ships.

Tankers, bulk carriers and freighters, refrigerated cargo vessels, container ships and ships of other types are built at the Öresund Yard. On order are some 15 ships totalling approximately 1,100,000 tons. About 70 percent of this tonnage is for export.

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Strachan Shipping Elects Officers

Strachan Shipping Co., ship agents and stevedores in Gulf Coast and South Atlantic ports, has announced the election of **Frank G. Strachan** as chairman of the board of directors, and **Thomas H. Adams** as president.

Mr. **Strachan,** president of the company since 1965, will continue to be active in the company's affairs, the announcement said.

Mr. **Adams,** previously a director and vice president, has been legal counsel for the company since 1947. He is a senior partner in the law firm of Adams, Adams, Brennan and Gardner. He is also secretary-treasurer of the Savannah Port Authority.

Named honorary chairman was **Robert W. Groves,** previously chairman of the board of directors. Other officials elected were: **Robert W. Groves Jr.,** vice chairman of the board; **H.H. Collins, L.W. Homburg, R.M. Wilkes, V.D. Fletcher** and **C.W. Pidgeon,** vice presidents; **W.A. Maher,** vice president, Gulf; **W.H. Osterholtz Jr.** vice president, Florida; **J.L. Clark,** secretary and treasurer, and **R.H. Jachens,** assistant treasurer-controller.

The company was founded in 1886, and in addition to Gulf Coast and South Atlantic ports, has offices in New York and several large inland cities.

Baldt Corp. Names Gallagher Controller Anchor, Chain Division

Joseph L. Gallagher

Baldt Corporation (OTC), New York, N.Y., has named **Joseph L. Gallagher** controller of the company's Baldt Anchor and Chain Division in Chester, Pa.

Mr. **Gallagher** comes to Baldt from the Royal Typewriter Division of Litton Industries, where he held successive positions as director of manufacturing cost control, and director of financial planning. Prior to that, he was with the National Sugar Refining Company as corporate cost accounting manager. His wide financial management experience includes extensive work in systems and procedures development.

Mr. **Gallagher** obtained his accounting degree from LaSalle College, and attended graduate school at the University of Pennsylvania.

Atlantic Richfield Appoints Applegate

Christopher P. Applegate has been appointed employee relations manager for Atlantic Richfield Company's nation-wide marine activities. He had been employee relations manager for Eastern area supply and transportation activities. His headquarters will remain at Atlantic Richfield's Fort Mifflin marine terminal in Philadelphia.

Mr. **Applegate** joined the company in 1948 at its Philadelphia refinery. He was named to his first personnel assignment in 1955. He holds a bachelor of science degree from Temple University.

Enjay Appoints Baltimore Agent

Enjay Chemical Company, Florham Park, N.J., has announced the recent appointment of George S. Goodhues & Son, Inc. (established in 1885) as agent for Marine Coatings and Chemicals in the Baltimore area.

George S. Goodhues Jr., vice president of the firm, stated that the complete line of Rust-Ban paints and marine cleaners will be stocked in their warehouse at 522 South Ann Street, Baltimore, Md. 21231.

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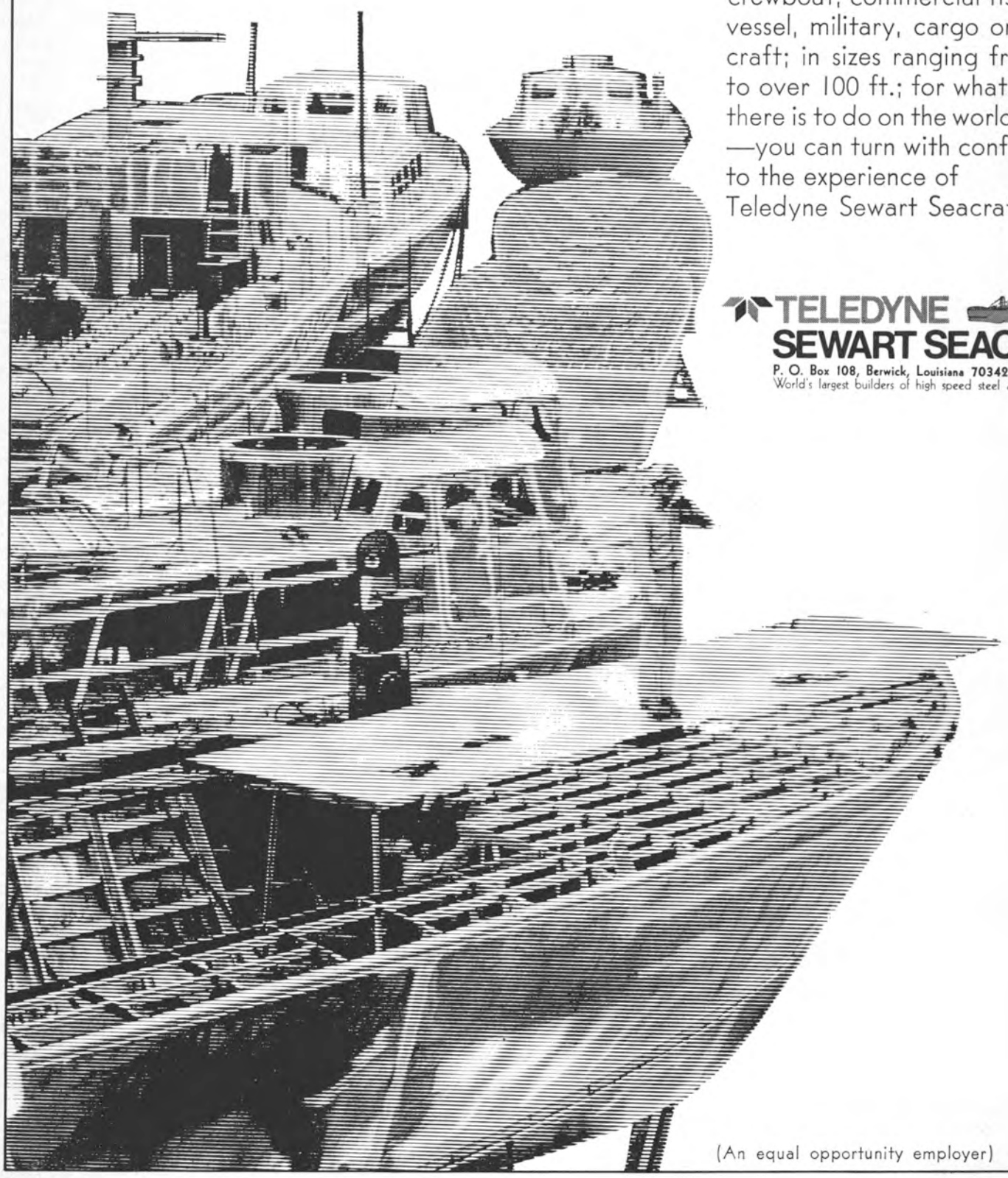
experience



Whatever your needs—oilfield crewboat, commercial fishing vessel, military, cargo or pleasure craft; in sizes ranging from 20 ft. to over 100 ft.; for whatever work there is to do on the world's waters —you can turn with confidence to the experience of Teledyne Sewart Seacraft.

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'Marine Decisions Under Uncertainty' Subject Of M.I.T. Special Summer Session

The purpose of the Special Summer Program at Massachusetts Institute of Technology (Monday, June 28, through Friday, July 2) is to acquaint marine investors and operators with the principles of decision theory and with their application to marine problems in which the consequences of one's choices are uncertain.

All decision makers face varying degrees of uncertainty. However, few executives confront uncertainties of the type and magnitude facing the marine investor. In fact, the juggling of uncertainties and the balancing of risk versus return is the essence of most marine decision making. Despite this fact, uncertainty and means dealing with it in a systematic, consistent manner have received almost no attention in either the marine literature or in marine practice. One result of this situation is that marine executives have found that the set of decisions to which they can usefully apply quantitative analysis is quite limited.

Decision theory is a recently evolved methodology which can handle the types of uncertainties which a marine investor faces. It demonstrates how he can "systematically" assay his feelings about the uncertain future and his attitudes toward risk and how, by straightforward calculation, he can determine which of several risky alternatives he should undertake if he is to be consistent with his own preferences and judgments. The application of this methodology to a variety of important marine problems has been the subject of a several year effort at M.I.T. under the auspices of the Sea Grant Program. This effort has culminated in the publication of "Marine Decisions Under Uncertainty," M.I.T. Press, 1970, which will be the text for the course.

A complete spectrum of marine decisions will be discussed, including search and exploration problems, maintenance and overhaul policies, and insurance and hedge alternatives. However, the greatest emphasis will be placed on investment problems in ocean transportation and specifically, on strategies toward the ship charter markets. Both the shipowner's and the ship charterer's problems will be treated in detail, including fleet mix decisions on the part of the combined owner-charterer. Recent work done at M.I.T. on a charter market model will be reviewed.

The treatment will be aimed at practicing marine investors and operators as well as technicians and researchers. Prior knowledge of decision theory or systems analysis will not be assumed. Some knowledge of probability would be helpful but is not required. Twenty-one 1½-hour lectures will be given during the five day period.

Monday, June 28—"Introduction to Decisions Under Uncertainty." An introductory example: Joe, the used shipbuyer. Detailed study of a simple example of a decision under uncertainty introducing decision trees, expected value, the basic rules for manipulating probability, how to fold back the decision tree, limitations on expected value decisionmaking.

Tuesday, June 29—"The Basic Postulates of Decision Theory." Non-formal but thorough development of judgmental probability and risk preference. How to handle non-expected value decisionmakers illustrated by the buy-insurance versus self-insure problem. Application of risk adversion to the used shipbuyer problem. Implications for financing strategies discussed.

Wednesday, June 30 — "Sequences of Decisions." Introduction to dynamic programming of sequences of decisions under uncertainty illustrated by a series of progressively more complex problems culminating with a discussion of ship production scheduling. Discussion of the coupling of dynamic programming with non-expected value risk preferences.

Thursday, July 1—"Applications in Marine Transportation Investment." Application of decision theory and dynamic programming to ship investment and operating decisions through time. Detailed study of the shipowner with captive trade problem, independent shipowner operating in uncertain charter market problem, and the combined charterer-owner problem, including fleet mix policies. Discussion will include a review of work done at M.I.T. on a model of the ship charter markets.

Friday, July 2—"Applications in Maintenance and Repair, Problems in which the Probabilities Change." Study of adaptive decision making introduced by the boiler tube pulling problem and proceeding to the general problem of reducing small sample, failure data and the integration of this data into the selection of maintenance, spare parts, and machinery investment alternatives. General review and discussion.

Lecturers for the program are Dr. **J.W. Devanney III** and **J.B. Lassiter III.**

Professor **Devanney** is an associate professor in the department of naval architecture and marine engineering at M.I.T., where he teaches graduate courses in the economics of marine systems and marine decision making under uncertainty. He is the author of the recently published "Marine Decisions Under Uncertainty," as well as studies of the conference system, fish protein concentrate, development of the coastal zone, and waste disposal at sea, among others. He has served as senior scientist for the Advanced Marine Technology Division of Litton Systems and as an operations analyst for Electric Boat Division of General Dynamics. He is, or has been, a consultant to the United Nations, the U.S. Navy, the National Academy of Sciences, and a number of marine transportation companies.

Mr. **Lassiter** is an instructor in the department of naval architecture and marine engineering at M.I.T., where he lectures in marine resource development, ocean structures, and non-linear hydrodynamics. He is the author of a comprehensive comparison of production and transportation alternatives with respect to the utilization of the Prudhoe Bay oil reserves entitled "The Economics of Arctic Oil Transportation." He has served as naval architect, ocean engineer, and consultant to a number of offshore oil development and marine transportation companies. He is presently writing his dissertation on non-linear water waves.

This program is sponsored in cooperation with the M.I.T. Sea Grant Program and the M.I.T. Commodity Transportation and Economic Development Laboratory. Tuition for the program is $330, due and payable upon notification of admission. No academic credit is offered.

National Marine Appoints Boyd Terminal Manager

Donald P. Boyd

National Marine Service, St. Louis, Mo., has announced the appointment of **Donald P. Boyd** as manager of their terminal facilities in the Tri-City Port area.

Mr. **Boyd** brings to his new assignment considerable experience in managing, development and constructing similar bulk storage and transfer facilities.

National Marine's facility is becoming an increasingly important intermodal terminal for transfer of bulk commodities such as caustic soda, petroleum products, soybean oil and liquid fertilizers.

Kelso Marine Promotes Three Executives

D.W. Hampton

M.T. Petersen

Russ Thatcher

Rai Kelso, president of Kelso Marine, Inc., Galveston, Texas, has announced the appointment of three staff management members. The positions were filled from the ranks of Kelso executives whose areas of responsibilities include engineering, operations, and administration.

D.W. Hampton has assumed the responsibility of production and engineering operations following his appointment as operations manager. Mr. **Hampton** has been with the firm four years and was most recently Kelso's chief engineer.

As newly-appointed administrations manager, **M.T. Petersen's** duties were expanded from purchasing agent to include direction of warehousing, contract administration, personnel and safety functions. Mr. **Petersen** has been with Kelso four and one-half years.

Russ Thatcher, former head of the research and development department, has been named chief engineer. Mr. **Thatcher** has been with the Kelso barge construction firm for three years.

Kelso Marine vice president and general manager, **Harry Fiegel Jr.** expressed his pleasure at these new positions being filled by persons within the organization. "These men are among the best in their field," said Mr. **Fiegel.** "There was no need to look beyond our own organization for executives capable of handling these jobs."

Kelso Marine is a fast-growing barge construction and repair yard on Galveston Island, Texas, at Intracoastal Canal Mile 355. Recent new barge construction includes the 430-foot superbarge Hawaii completed in 1970, another superbarge for Crowley Launch & Tug, and several deck barges for Lone Star Cement Corporation and Sedco.

The yard is noted for its automated construction techniques and rapid growth into superbarge capabilities. Among the jobs currently under way at the facility is a uniquely-built pressure tank barge for Central American Barge Lines featuring 40-foot-diameter cylindrical tanks. Also under construction are three additional sand and gravel deck barges for Lone Star Cement Corporation, and 10 open hopper barges.

Philadelphia Sections Discuss Prevention Of Water Pollution At SNAME/IEEE Joint Meeting

Shown above at the joint meeting in Philadelphia, left to right, are **Fred Praiseman,** PSNY, chairman IEEE and coordinator; **George Johnson,** U.S. Army Corps of Engineers, SNAME chairman; Cmdr. **R.J. Hanson,** USCG, author, and **B.B. Cook Jr.,** De Laval Turbine, Inc., SNAME vice chairman.

The Annual Joint Meeting of the Philadelphia Section of The Society of Naval Architects and Marine Engineers and the Philadelphia Section of the Institute of Electrical and Electronics Engineers (IEEE) was held February 19, 1971, at the Philadelphia Engineers Club. Sixty-five members and guests were in attendance. The topic of the paper presented was water pollution prevention and detection.

The title of the paper presented was "Combating Oil Pollution a Coast Guard Mission," written by Comdr. **R.J. Hanson,** USCG, Chief Intelligence and Law Enforcement Branch, Third Coast Guard District, Governors Island, N.Y. The author discussed water pollution, what it is, where it comes from, its causes, and the tools available to combat it. Emphasis is on prevention, but the presentation includes regulations, inspection, navigation, equipment, training and enforcement.

The status of detection and its future development were discussed, with some views on containment and cleanup. The U.S. Coast Guard's responsibilities in the field of water pollution, and what each citizen can expect from this organization was covered.

Coordinator for the meeting was **Fredrick Praiseman,** Philadelphia Naval Shipyard Public Works Division.

Matson Installs System To Check Location, Status And Condition Of Containers

The computer age has combined with the container age to provide faster and more efficient freight service between Hawaii and the mainland via Pacific Coast ports.

A computer-controlled container information system has been installed by Matson Navigation Company at its Oakland and Los Angeles harbor container terminals. Matson, which pioneered containerization to Hawaii 13 years ago, operates a 42-acre facility in the Port of Oakland's 7th Street complex, and a new 50-acre yard on Terminal Island at the Port of Los Angeles.

The computer hookup enables Matson to maintain up-to-the-minute information on container yard activities in both regions, including the whereabouts, status (whether loaded or empty) and condition of each of the thousands of containers in the area at any time. The system also provides overall reports of container yard operations at a glance, a great asset in cargo planning and expediting the intermodal movement of freight to and from Hawaii, according to Matson Terminals operations representatives at both yards.

New information is fed, via four remote input terminals (display stations) strategically located at each yard, to a large central computer at Matson headquarters in San Francisco. For approximately 20 hours daily, the display stations are in constant contact with the central computer. The containers are recorded in and out of each yard by identification number. Additional information about status, position in yard, etc. may be entered by any of the stations, any of which may also obtain all the latest information from the central computer within seconds.

Information is available in both summary form and detail form for each of the more than 100 different types of containers currently being handled in the container terminals by writing **C.E. Regal,** Public Relations Department, 100 Mission Street, San Francisco, Calif. Telephone (415) 982-7700.

Twin City Barge Receives 'Helpers Of The Court' Award

The "Helpers of the Court" award has been presented to Twin City Barge & Towing Company, St. Paul, Minn., by the St. Paul Judges of Municipal Court for the firm's role in hiring and helping rehabilitate alcoholics.

John Mathews, director of personnel at Twin City Barge, received a special plaque from the judicial group. Last year, Twin City Barge hired alcoholics, who were undergoing treatment at Hastings State Hospital, for work at the firm's Prescott, Wis. barge-cleaning facilities.

The plaque is inscribed: "In recognition of Twin City Barge & Towing Company's humane and prudent program for the rehabilitation of alcoholics and for its successful efforts in conserving and restoring them to gainful employment and useful citizenship."

Puerto Rico Marine Lines Inaugurates Tug And Barge Cargo Service From Gulf

Plans were announced for the inauguration of a monthly cargo service by Puerto Rico Marine Lines, between the Gulf ports of Lake Charles, Houston and Galveston, and the Puerto Rican ports of San Juan, Mayaguez and Ponce.

Puerto Rico Marine Lines, a division of Puget Sound Tug and Barge Co., Inc., of Seattle, Wash., will operate oceangoing barges and tugs in the new service, and all cargo will either be unitized or palletized to provide for efficient and fast cargo handling. All of the barges are built to American Bureau of Shipping standards and are certified for ocean operation. The tugs are fully automated and are powered by 3,500-hp diesel engines.

Lykes Bros. Steamship Co., Inc., a pioneer in the Gulf-Puerto Rico trade, has been appointed general agents for Puerto Rico Marine Lines at all U.S. Gulf ports and throughout their hinterland, comprising the entire Mississippi Valley area. All Lykes offices are accepting cargo bookings for the new service.

Puerto Rico Marine Lines' parent company, Puget Sound Tug and Barge Co., has a long history of successful ocean barge operations out of Pacific Coast ports, including the Alaska Hydrotrain, a twice-weekly train ferry service between Seattle and the Alaska rail belt.

The company also played an important role in the development of the North Slope oil operation, and set a record when it delivered 190,000 tons of oil field equipment by barge to Prudhoe Bay in 18 days of operations under extremely adverse conditions.

Towboat For Ingram Barge Co. Christened At Nashville Bridge

Participants at the christening left to right are: **Mrs. Raymond Tesch,** co-sponsor; **Bill Gee** holding the umbrella for his wife, and **Bill Barton** of Nabrico Marine Department standing ready with towel.

With a splash of champagne broken over the capstan, the M/V Bill Gee was christened recently at the Nashville Bridge Company shipyard, Nashville, Tenn. The vessel was built for Ingram Barge Company, and was named for Ingram vice president **William D. Gee. Mrs. Gee** was the sponsor at the christening and **Mrs Raymond Tesch** served as co-sponsor.

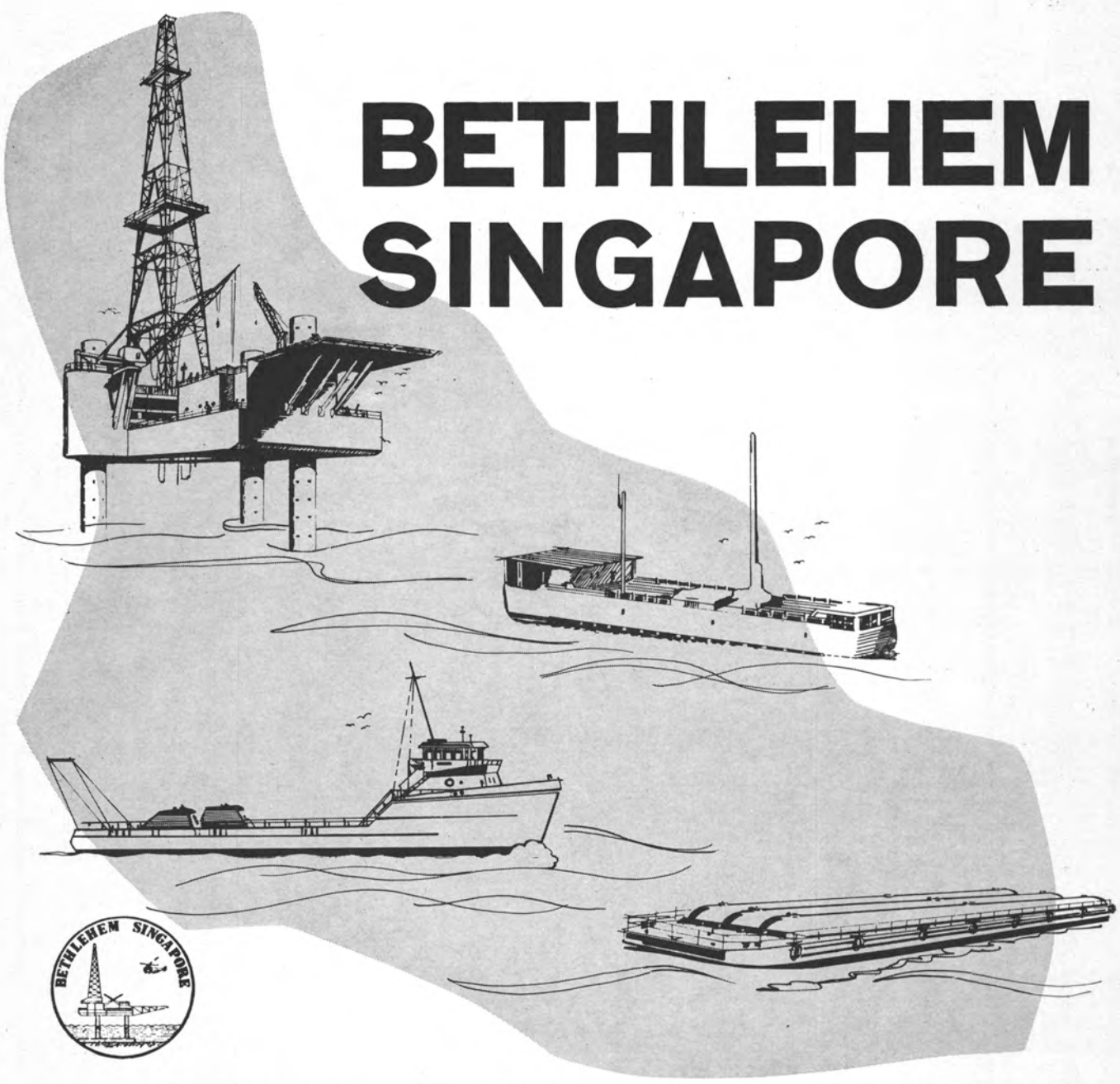
Mr. **Gee** has been in marine transportation for 34 years, having started with Socony-Vacuum Oil Co. at Kansas City, in 1937. He joined Ingram Barge Co. in 1947 as chief engineer of the M/V E.B. Ingram, and later the M/V Nelson M. Broadfoot. These vessels were the first two built for Ingram by Nabrico. In 1950, Mr. **Gee** was promoted to port engineer and was elevated to vice president, engineering in 1965. Since that time, Ingram has built five new towboats and currently operates a fleet of nine towboats. The M/V Bill Gee is the third Nabrico built vessel delivered to Ingram since last July, when the M/V Bruce Brown was delivered. The M/V John M. Rivers was delivered in September.

Mrs. Gee the former **Sally Williams,** was an employee of Ingram Barge when the M/V E.B. Ingram was built, and she served as sponsor for both the M/V E.B. Ingram and the M/V Nelson M. Broadfoot.

The new twin-screw, kort nozzled vessel measures 121-feet by 33-feet by 10-feet six inches, and is powered by two General Motors Electro Motive diesels, 8-645-E5. It has two 96-inch stainless five-blade propellers. The retractable pilothouse towboat went into immediate service.

A large company of invited guests witnessed the christening, and were treated to a walk-through inspection of the vessel prior to the ceremony. Following the ceremony, Nashville Bridge Company hosted a party for the guests at the Hillwood Country Club.

The new twin-screw towboat M/V Bill Gee undergoing river trials prior to the christening at Nabrico.



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Industry Leaders To Speak At San Juan Propeller Club Convention April 20-25

The San Juan chapter of The Propeller Club of the United States is holding its first Regional Convention in San Juan April 20-25, 1971.

The Club has engaged the entire facilities of the San Jeronimo Hilton for this event. In addition to the attendance of the Governor of Puerto Rico and other local dignitaries, they have scheduled addresses by nationally prominent leaders of the maritime industry such as Assistant Secretary of Commerce **Andrew E. Gibson** and Federal Maritime Commission Chairman **Helen Delich Bentley.** A panel of maritime labor leaders including Messrs. **Curran, Hall** and **Gleason** is programmed for one of the business sessions.

The Port Authorities of Puerto Rico, St. Thomas, St. Croix, Trinidad and the Dominican Republic will be exhibiting. Also displays will be made by the Port Authorities of New York, Florida ports, New Orleans, Norfolk, North Carolina ports, Savannah, Panama City etc.

An interesting social program has been arranged including a San Juan harbor trip, a rum party, a Puerto Rican "Jibaro Pig Roast", Dorado Beach Golf Tournament, Governor **Ferres'** special reception and the gala reception and banquet.

Keynote address for the Convention will be delivered by **Edwin M. Hood,** president of the Shipbuilders Council of America.

Convention chairmen are **Cesar Canals,** chairman, Southeast Regional Convention, Director, Puerto Rico Ports Authority, and **G.A. Brunelle,** vice president, Southeast Region, Propeller Club of the United States.

Inquiries directly related to the Convention should be mailed to The Propeller Club, Port of San Juan, P.O. Box H, Old San Juan, Puerto Rico 00902.

Lloyd's Approves Triple Engine Diesel Installations For New Generation Of Containerships

Four fast triple-screw containerships now on order to Lloyd's Register class at Burmeister and Wain, Denmark (two ships), Oresundsvarvet A/B, Sweden (one ship), and the Mitsui Shipbuilding & Engineering Co. Ltd., Japan (one ship), will each have power installations approved by Lloyd's Register consisting of three main diesel engines delivering up to 75,000 hp to three propellers.

The ship to be built in Sweden will have a 12-cylinder Gotaverken DM 850/1700 VGS 12U center engine with 10-cylinder engines of similar design port and starboard. The other three ships to be built in Denmark and Japan will have a 12-cylinder Burmeister & Wain K84 EF center engine with 9-cylinder engines of similar design port and starboard.

All the ships will have fixed-pitch port and starboard propellers and controllable-pitch center propellers—the most powerful yet made by Karlstads Mekaniska Werkstad, Sweden. This means that the center engine can be operated at a speed which will avoid resonance between engines and so reduce vibration.

These new containerships for owners, Scanservice (East Asiatic Co. Ltd., Swedish East Asia Co. Ltd., and Wilhelm Wilhelmsen), should be capable of about 26 knots on three engines, or 20 knots using the center engine only.

At present there are 24 fully cellular containerships over 20,000 grt in service, and 13 of these are classed with Lloyd's Register. Out of a total of 41 fully cellular containerships over 30,000 grt under construction or on order throughout the world, 19 are to be built to Lloyd's Register class.

Joint Agency To Consolidate MTMTS Activities And Military Sealift Command

Deputy Secretary of Defense **David Packard** has directed the Secretaries of the Army and Navy to submit a joint plan to consolidate activities of the Military Sealift Command (MSC) and the Military Traffic Management and Terminal Service (MTMTS) in a single new jointly-staffed agency.

The new agency, which has not yet been named, will report to the Secretary of Defense through the Secretary of the Army, and except for intra-theater land transportation in overseas areas, will be the single manager for DoD surface transportation worldwide.

Reductions in operational costs will include establishment of a single computer system for all surface movements and thus, elimination of the present multi-systems worldwide, and consolidation of industrial funds with consequent reduction in overhead and simplification of billing to the military shippers.

The Navy will retain responsibility for operating Government-owned and certain chartered vessels; operation of vessels used for non-transportation purposes, such as oceanography; and maintenance, operation and alteration of Government-owned and certain chartered vessels. In addition, the Navy will continue to prepare recommendations for design, specifications and equipment of oceangoing vessels.

Headquarters for MTMTS and MSC are in the Washington, D.C. area, and both agencies have subordinate headquarter commands in New York City, and Oakland, Calif.

Hawaii Section Paper Describes Computerized Ship Overhauls

Shown above at the meeting on February 9, left to right, are: Cmdr. **Clinton Kreitner,** USN, Design Superintendent, Pearl Harbor Naval Shipyard, papers chairman; Capt. **J.C. McArthur,** USN, Force Maintenance Officer, Service Forces, Pacific, author; Capt. **Kenneth Wilson,** USN, Commander, Pearl Harbor Naval Shipyard, Section chairman, and **J.T. Geeb,** engineer, Pearl Harbor Naval Shipyard, author.

The Hawaii Section of The Society of Naval Architects and Marine Engineers enjoyed a pre-dinner cocktail hour before its February meeting at the Ala Moana Banquet Hall, Honolulu.

The technical presentation by Capt. **J.C. McArthur,** USN, and **J.T. Geeb** outlined "A Ship's Force Overhaul Management System Utilizing A Time-Shared Computer." Comdr. **Clinton Kreitner,** papers chairman, introduced the authors.

Captain **McArthur** conducted the first half of the presentation and described the problems facing the ship's force upon commencing a yard overhaul. Until the described system was developed, Navy Yard overhauls did not benefit from efficient utilization of the ship's force to accomplish elements of the overhaul within their capabilities. Computerized control of the costly, complex and sophisticated nature of large carrier overhauls led to the development of the system by Captain **McArthur** and Mr. **Geeb.** They felt that medium and smaller ships could also benefit from such computer control and have used their system in recent overhauls at Pearl Harbor Naval Shipyard.

Mr. **Geeb's** part of the presentation dealt with the computer program itself, and he described how a BASIC Time-Sharing Computer (used by Pearl Harbor Naval Shipyard) is well-suited for the task. Mr. **Geeb** demonstrated the use of a briefcase-sized teletype unit which can be operated from any telephone by a dataphone hookup, thus making its use feasible for a small vessel. Recent Navy Fleet Tug overhauls at Pearl Harbor proved the economies of the system, with $1-million overhauls controlled by about $800 total computer costs. The Fleet Tug commanding officers were enthusiastic about the demonstrated value of the system.

Following the presentation of the paper, the session closed after comments and discussion by Rear Adm. **David Jackson,** Fleet Maintenance Officer, Staff, Cincpacflt/Comservpac.

GE, Kvaerner Brug Receive Order For Marine Propulsion Gas Turbine For Tanker

The General Electric Company's gas turbine operations announced that its newest manufacturing associate, Kvaerner Brug of Oslo, Norway, received an order for a GE-design marine propulsion gas turbine. **Whitman Ridgway,** deputy division general manager of the operations, made the announcement.

The GE propulsion unit will power a 29,000-cubic-meter combination ethylene/methane tanker to be built by Moss Shipyard of Norway for Hilmar Reksten, Bergen. Head of a 1.4 million ton fleet, Reksten is a shipowner of rising prominence in the booming tanker business.

The ship will carry ethylene as primary cargo, during which it will operate on Bunker C fuel. It will be equipped to carry methane and will be capable of burning methane boil-off or any combination of boil-off and Bunker C.

The propulsion plant is a 20,000-shp MS 5212R, regenerative, heavy-duty gas turbine, gear drive, and CP propeller. Auxiliary power will be provided by diesel generator sets.

The propulsion unit order for the LNG tanker represents the first for Kvaerner Brug, which was established as a manufacturing associate with General Electric's gas turbine operations in August 1970. Kvaerner Brug expects to be a major participant in the gas turbine propulsion market, which has a prospect of great growth as gas turbines become more recognized as a competitive marine propulsion plant.

On the Reksten project, GE will furnish the rotating parts plus some other specialized components. The balance of the machine will be fabricated and assembled by Kvaerner Brug at its plant in Oslo.

Commenting on the unit, a Reksten spokesman said: "This ship is rather small compared to the rating of the propulsion unit. For that reason, the gas turbine alternative offered several important advantages as regards weight and machinery arrangement.

The order is significant in that it is GE's first European gas turbine marine order and the first tanker order. It follows another order recently announced by GE from the Broken Hill Proprietary Company, Ltd., Melbourne, Australia, for heavy-duty gas turbines for two roll-on/roll-off special products carriers.

The heavy-duty gas turbine, a General Electric spokesman said, has unique capabilities in being able to readily burn combinations of liquid and gaseous fuels simultaneously. Thus, this application permitting the burning of LNG boil-off and Bunker C affords the opportunity to shippers such as Reksten to use this capability at sea.

Delivery of the tanker is anticipated in 1974.

Paper On Planing Boat Design Presented At Winter Meeting Of SNAME Southeast Section

Shown above at the winter meeting in Miami, left to right, are: **Frank DeGrim,** vice chairman of the Southeast Section; **Jean Buhler,** meetings committee chairman; **John C. Angeli,** author; **Robert W. Hobbs,** chairman of the Section, and **Raymond Greene,** admiralty attorney.

"Evaluation of the Quality of Planing Power Boat Designs" is the title of a paper presented by **John C. Angeli** at the winter meeting of the Southeast Section of The Society of Naval Architects and Marine Engineers at the Coral Reef Yacht Club in Miami, Fla., on February 18, 1971.

Mr. **Angeli,** a member of SNAME's Panel H-12 on Planing Power Boats, is also a member of the Society of Automotive Engineers and the French Association Technique Maritime et Aeronautique. He has had experience in the design of engines, automobiles, sail and power boats; and immediately after World War II, was technical head of the committee for reorganization of the French automotive industry under the head of the Ministry of Industrial Production.

In his paper, Mr. **Angeli** proposes a yardstick and a method of comparison of planing boat performance independent of speed and displacement, which is applicable at an early stage of a design. He suggests that the lack of such a design technique is retarding progress in planing boat development.

Several members of the H-12 Panel discussed Mr. **Angeli's** paper, including **Joseph Koelbel, Daniel Savitsky** and **Donald Blount. Charles Bond** also offered comments.

Robert W. Hobbs, chairman of the Section, presided over the meeting, during which nominations for officers for 1971-72 were received. The nominees were: **Frank DeGrim** of Jacksonville, Fla., for chairman; **Edward Teale Jr.** of Clearwater, Fla., for vice chairman, and **James S. Krogen** for secretary-treasurer. **E.B. Williams** was nominated for a three-year term on the executive committee.

The next meeting of this section will have the theme "The Naval Architect in Court," and will present examples of legal situations which involve ship designers.

State University Of New York Maritime College Gets Grant From Gulf Oil Foundation

Rear Adm. **Edward J. O'Donnell** receives the check from **D.G. Brown,** manager of Gulf Oil Corporation's U.S. fleet. At left, **T.P. Leonard,** Gulf's director of vessel personnel.

The State University of New York Maritime College, Fort Schuyler, N.Y., has received a grant of $1,500 from the Gulf Oil Foundation, Rear Adm. **Edward J. O'Donnell,** USN (ret.), president of the college, has reported. The Gulf Oil Foundation is an educational assistance program sponsored by the Gulf Oil Corporation. This latest donation to the Maritime College by Gulf was designated as a grant to further special projects of the college.

Just about a year ago the Foundation donated $1,000 to the Maritime College Development Fund, and the company annually presents a $100 Savings Bond to each of two cadets chosen for "outstanding" performance of duty during the summer cruises of the college's training ship Empire State IV.

Formal presentation of the $1,500 grant was made to Admiral **O'Donnell** by **D.G. Brown,** manager of Gulf's U.S. fleet, and **T.P. Leonard,** director of vessel personnel. In accepting the grant, Admiral **O'Donnell** described Gulf Oil as one of the college's "staunchest friends," and he expressed the gratitude of the college for the organization's continuing support.

Electro•Controls Introduces Bow Thruster Control Unit

Electro•Controls has announced a bow thruster controller designed to operate a Sundstrand type hydrostatic transmission. This unit is specifically designed for external mounting on the bridge of the boat. Optional mounting provisions are available.

The unit operates in two modes: (1) manual mode controls the thruster speed port or starboard, and (2) auto mode uses signals received from the vessel's auto pilot and controls the speed and direction of the thruster to bring the vessel back on course.

The auto mode provides for precision course holding without headway. This mode can be used for maintaining the vessel's orientation to the prevailing sea to provide the most stable work platform.

In addition to the control electronics located on the bridge, the unit is supplied with a servo valve to be mounted on the pump which controls the swash plate position actuator. Controlling the pump swash plate angle effectively controls the speed and direction of the hydraulic motor attached to the bow thruster drive unit. Availability of the system is 30 to 60 days.

For further information and literature, contact Electro•Controls, 2003 South Ritchey Street, Santa Ana, Calif. 92705.

Anixter-New York Moves To New Office & Warehouse Facility In Elmsford, New York

Anixter-New York is the new name of Anixter-Normandy, a pioneer distributor of electrical cable, it was announced by **John Myers,** president. Anixter-New York has completed its move to a new 60,000-square-foot office and warehouse facility, one of the country's most modern and efficient electrical wire and cable warehouses, according to Mr. **Myers.** Located at 300 Executive Boulevard, in Cross Westchester Executive Park, Elmsford, it features newly designed materials handling equipment.

Anixter-New York, a part of Anixter Bros., Inc., Skokie, Ill., is an integral part of Anixter's continent-wide network of electrical cable specialists, which has distribution centers in 22 major cities in the United States, Canada and Europe.

The 25-year-old Anixter-New York firm is well known in the maritime industry as a major supplier of electrical shipboard cable to shipyards in Canada, Europe and the Eastern United States. Mr. **Myers** stated that Anixter-New York has experienced a tremendous growth in industrial cable sales in the mid-Atlantic market, and he said: "Our new and enlarged facility will allow us to carry broader electrical cable stocks than ever before."

In serving the Northeast area, they will inventory over 5,000 different sizes and types of electrical cable made by major manufacturers, including all types of shipboard cable, industrial cable, coaxial cable, electronic wire, portable cords, high voltage power and control cable.

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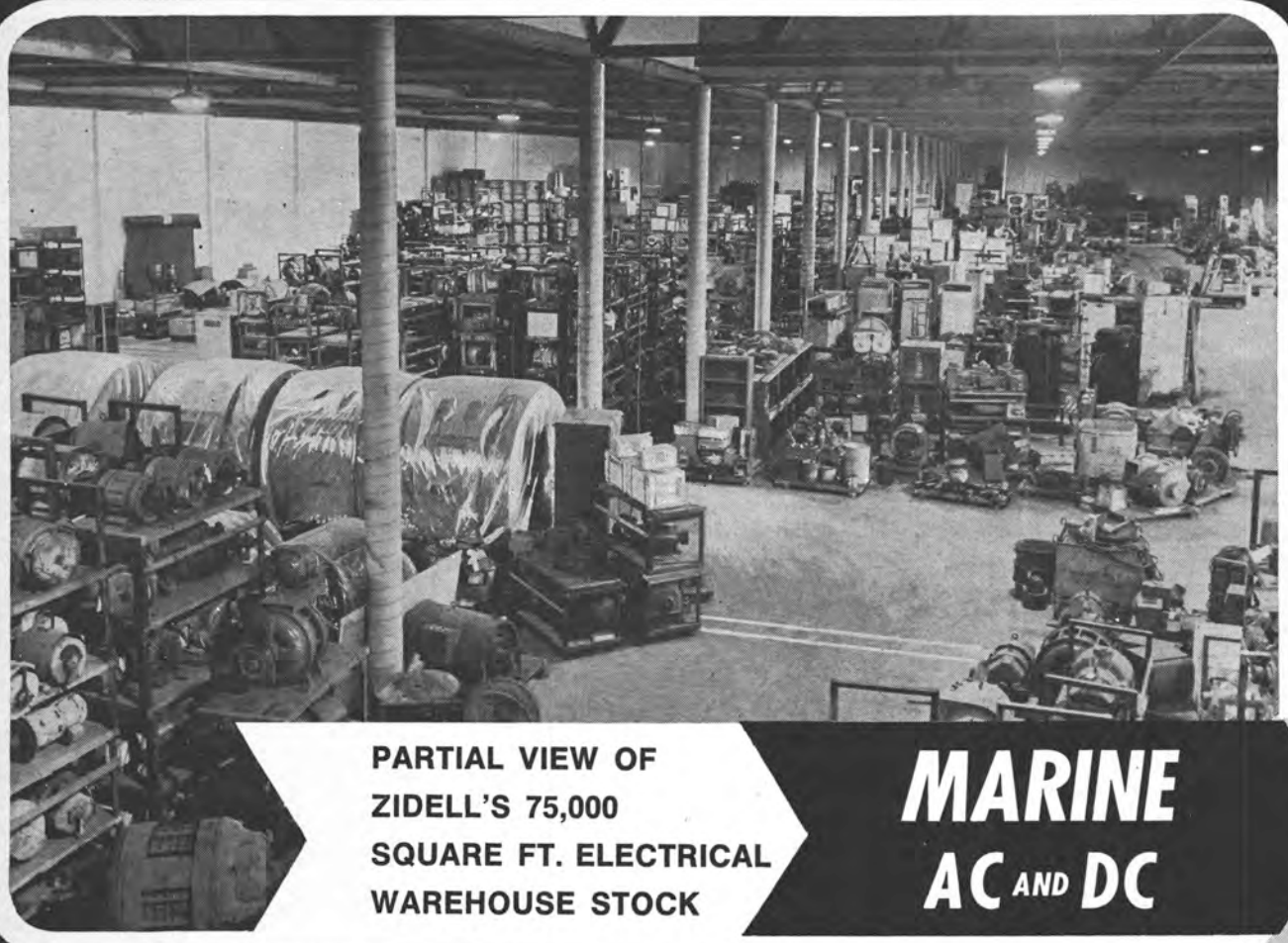

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Bailey Meter Opens New Marine Office

Bailey Meter Company, Wickliffe, Ohio, has opened a marine sales and service office in Bala-Cynwyd, Pa. The new office performs all marine sales and service operations previously handled by Bailey district offices in the Eastern region. This covers the East Coast from Maine to Virginia.

The Bailey marine office was established to respond solely to marine sales and service needs. It provides a pool of marine-experienced application engineers and technicians who can perform expert engineering service, installation supervision, and maintenance on a short notice basis.

Heading the group of marine application engineers and technicians is **C.E. Hatton.** A member of The Society of Naval Architects and Marine Engineers and the Instrument Society of America, Mr. **Hatton** has been involved with the U.S. Navy and merchant marine activities for Bailey since 1955. He holds a B.S.-M.E. from Rutgers University and a M.S.M.E. from Drexel University.

A subsidiary of The Babcock & Wilcox Company, Bailey has been a leading manufacturer of marine instrumentation and control systems for over 40 years. Known for systems engineering capability, Bailey supplies complete centralized engine room control systems, including throttle control, boiler control, and burner management systems. Since 1964, Bailey has provided control systems for over 160 ships, including complete engine room automation for the first steamship certified by the U.S. Coast Guard for operation without a fireman.

Sioux City And N.O. Barge Lines Appoints Edward Cody

Edward A. Cody

Edward A. Cody has recently been appointed to the position of assistant controller and office manager for Sioux City and New Orleans Barge Lines, Inc. of Clayton, Mo. In his new position, Mr. **Cody** will assume full responsibility of all accounting functions of the Barge Lines and its affiliate, Sioux City and New Orleans Terminal Corp. In addition, he will supervise the general office staff.

Mr. **Cody,** a native of Bagenalstown, Ireland, has been in the United States since 1952, and has been associated with the barge and towing industry for the past six years.

Five-Day Course On Diesel-Electric Plants At U. Of Wisconsin

A short course on the subject of "Stationary and Marine Diesel-Electric Power Plant Operation and Maintenance" is scheduled for May 3-7, 1971, in Milwaukee. The Extension Division of the University of Wisconsin is offering this five day course for supervisors, operators and maintenance personnel responsible for stationary and marine diesel engines, generators and associated electric equipment. The course is being offered to provide the practical knowledge necessary for efficient operation and control of power generating equipment.

The principal lecturers will be **John Kuehn,** marine diesel operating engineer, and **Karl Dudey,** P.E., consultant, electric power system and control engineering. Other speakers from the University of Wisconsin and industry will participate in this short course.

The fee for this program will be $200. Please contact **John M. Leaman,** Course Director, at the University of Wisconsin Extension, Department of Engineering, 600 West Kilbourn Avenue, Milwaukee, Wis. 53203, telephone (414) 228-4323.

Raytheon Appoints Engineering Mgr. For Manchester Operation

James P. Ackerman

James P. Ackerman has been named engineering manager for Raytheon Company's Manchester, N.H. operation. He will direct engineering activities for Sorensen power supplies, Weldpower precision welding products, ultrasonic impact grinders, ultrasonic measuring systems, and a complete line of marine electronic products, including radars, radiotelephones, radio direction finders and Fathometer depth sounders.

Mr. **Ackerman** joined Raytheon in 1960 and served in various engineering posts with the Missile Systems Division for the past five years.

He received his B.S.E.E. degree from Marquette University in 1960 and his M.S.E.E. degree from Northeastern University in 1965. He is a member of the Institute of Electrical and Electronic Engineers.

Texas Transport Names E.H. Hall Jr. To Manage Norfolk, Va. Office

Robert F. Weiss, vice president-Atlantic, Texas Transport & Terminal Co. Inc., has announced the appointment of **Everett H. Hall Jr.** as manager of the company's Norfolk, Va. office.

Mr. **Hall** joined Texas Transport & Terminal Co. Inc. as assistant manager in 1968, at the time of the opening of the Norfolk office. Prior to that time, he was associated with Furness, Withy & Co. Ltd. in Norfolk.

As Norfolk manager, Mr. **Hall** will be responsible for the complete supervision of sales representation and traffic matters in Virginia, North Carolina and eastern Tennessee, as well as all agency and ship operations supervision in the Hampton Roads area.

Charles R. Christensen Elected To PFEL Board

Charles R. Christensen was elected to the board of directors of Pacific Far East Line, Inc., it was announced by **Leo C. Ross,** president of the San Francisco-based freight and passenger steamship company.

Mr. **Christensen** is a transportation consultant and a retired vice president, operations, of Consolidated Freightways.

Lake Carriers' Reports Great Lakes Tanker Trade Up In 1970

The volume of petroleum products transported on the Great Lakes reflected the overall upward trend of the lake trade during 1970, it was announced by **Oliver T. Burnham,** vice president, Lake Carriers' Association. The organization's annual announcement concerning the year's lake tanker tonnage, including both United States and Canadian fleets, shows that a total of 13,872,812 net tons, the equivalent of 99,904,812 barrels, were transported.

The tanker trade in 1970 represented the maximum achievement for this segment of Great Lakes commerce since the season of 1961. It is interesting to note that the fleet in 1970 was comprised of 69 units, compared with 87 carriers available during the earlier year.

Shipments in 1970, expressed in barrels, were 4.63 percent above those of the preceding year, while the tonnage equivalent represented a trade expansion of 5.52 percent. The tanker fleet was composed of 18 U.S. vessels, and 29 Canadian carriers, being augmented by 21 New York State Barge Canal tankers, which participated in the lower lakes movement.

SNAME San Diego Section Holds Joint Meeting With ASNE

Participants at the joint meeting, left to right: (standing) **T.S. Hand Jr.,** vice chairman of the San Diego Section of SNAME; **C.S. Sinclair,** Section chairman; Capt. **N. Osborn,** outgoing chairman, the American Society of Naval Engineers, Inc., and **R.E. Patton,** chairman, the American Society of Naval Engineers, Inc.; (seated) **D.L. Brining** and **P.H. Benson,** speakers, and **G.A. Uberti,** secretary-treasurer of the San Diego Section.

The regular monthly meeting of the San Diego Section of The Society of Naval Architects and Marine Engineers was held as a joint meeting with the American Society of Naval Engineers at the San Diego Yacht Club on February 17, 1971.

Following dinner, a technical paper entitled "Marine Fouling and its Prevention" was presented by **P.H. Benson** and **D.L. Brining** of Lockheed Ocean Laboratory in San Diego, Calif. The qualitative and quantitative aspects of marine biological fouling and environmental factors influencing its character were discussed. Effectiveness of presently used systems were compared, and future needs for fouling prevention, projecting present methods and future approaches which warrant further research, were indicated.

An extended question and answer period, conducted by Mr. **Benson,** proved of great interest to attending members of both Societies.

A suggestion by **C.S. Sinclair,** chairman of the San Diego Section, The Society of Naval Architects and Marine Engineers, to make this joint meeting an annual event found great response by the attending members.

H. Lee Sellers Jr. Named Port Operations Director At Port Of Long Beach

Capt. **John Rountree,** director of port operations for the Long Beach Harbor Department since 1966, has submitted his request for retirement to the board of harbor commissioners. At the same time, the board approved the promotion of Col. **H. Lee Sellers Jr.** to the vacated post. Colonel **Sellers** was previously assistant director of port operations.

Colonel **Sellers** was Chief of the Export Control Division, Western Area, Military Traffic Management and Terminal Service, prior to his retirement and subsequent post with the port. He was responsible for the movement of millions of tons of Defense Department cargo from the 14 Western states through major Pacific Coast ports. He is credited with pioneering the now widespread use of containers to move Government supplies by ship.

Captain **Rountree,** a graduate of the U.S. Coast Guard Academy, was Commander of the 11th Coast Guard District at the time of his retirement from the Coast Guard in 1958. Early in 1959, he was named traffic manager for the Port of Long Beach, and was appointed director of port operations 4½ years ago.

The Port of Long Beach is currently creating a 300-acre container complex, which will be the largest in the Pacific area by 1973.

Bureau Veritas Provides Worldwide Service In Ship Tonnage Admeasurement

A tonnage survey office was created at the Paris Administration of Bureau Veritas in 1968 to satisfy requests made by several shipowners for the issuance of tonnage certificates for their vessels.

Failing a universal tonnage rule applicable to all ships, irrespective of their flag, it is always necessary to modify the tonnage of a vessel when her nationality changes. It is therefore interesting for owners, when purchasing a ship they intend to keep or which they seek to bring under Bureau Veritas class, to know that the appropriate tonnage certificate can be issued or prepared by that classification society. This is specially the case of ships flying Liberian, Panamanian, or Greek flags. Over 20 nations have recognized Bureau Veritas, or authorized them, either for the issuance of national tonnage certificates or for the calculation of the gross and net tonnages.

As to new buildings, they are first measured up on drawings (lines plan, general arrangement, engine room plans, etc.), after which a thorough survey of the ship is carried out at appropriate stages to check the readings made off the plans. For instance, where ships are built in Japan, these steps are carried out in Japan and the final calculations are carried out in Paris.

The development of Bureau Veritas Tonnage Survey Office activities since 1968 is shown in the following table:

	1968	1969	1970	% Dif. 1970/69
No. of Ships	140	186	264	+41.9
No. of Certificates	190	224	311	+38.8
Gross Register Tons	675,913	785,429	1,008,354	+28.4

An idea of what one-million grt measured up for tonnage by Bureau Veritas represent is given by comparing that figure to the 15,122,185 grt of the whole fleet of ships classed with that society.

The figure of 311 tonnage certificates issued in 1970 breaks down as follows: National Tonnage Certificates, 236; Suez Canal Certificates, 35; Panama Canal Certificates, 40.

The work of the Bureau Veritas Tonnage Survey Office has been made much easier by the assistance given by a computer geared to calculate a ship's gross and net tonnages under any tonnage system. Two features of the computer assistance which are of interest both to owners and to tonnage authorities are the accuracy of results and the speed with which the final figures are obtained.

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HERCULES DOOC, 10 KW, 120 DC, Radiator cooled.

CATERPILLAR, radiator cooled, 15 KW, 120/240 Volts DC.

GM, 4-71, 60 KW, 220/440 AC.

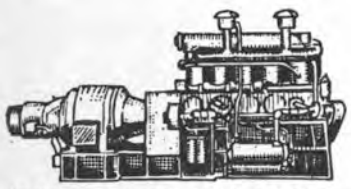
HERCULES, DJXC, 25 KW, 120 DC.

CUMMINS A1, 30 KW, 120 DC.

MURPHY, Model ME 66, radiator cooled, 75 KW, 120/240 Volts DC.

CATERPILLAR DIESEL ENGINE, Model D13000, 167 HP, 900 RPM, with Louis-Allis Generator, 85 KW, 220 AC.

LORIMER F5SS, 75 KW, 120/240 DC, radiator cooled.



LORIMER 100 KW, 450/3/60 Volts DC.

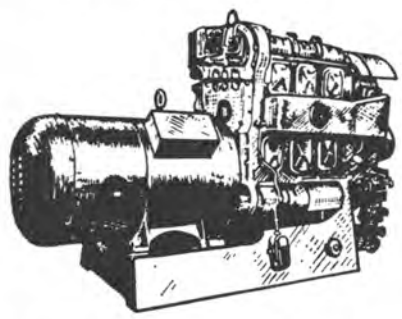
BUDA 6DHG691, 60 KW, 120 Volts DC.

SUPERIOR GBD-8, 100 KW, 240/120 Volts DC.

GM-3-268A, 100 KW, 240/120 Volts DC.

SUPERIOR, Model 1DB-8 100 KW, 450/3/60.

GM, 8-268, 300 KW, 260/345 DC.



GENERAL MOTORS Model 3-268A, 152 BHP, 1200 RPM, with 100 KW Generators, 450 Volts AC, 3 phase, 60 cycles.

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1800 HP, 800 RPM,
2 cycle, 8½" bore,
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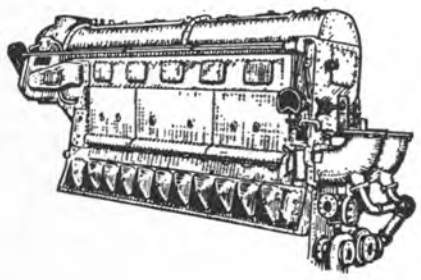
Complete with Westinghouse Reduction gears 2,216:1 ratio, with Hydraulic Coupling



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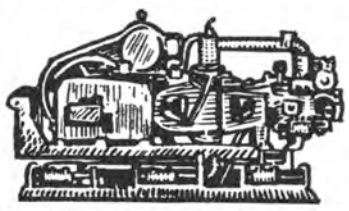
INGERSOLL-RAND, 150 CFM, 600 PSI, Model 75, with Westinghouse Motors, 75 HP, 230 DC.

INGERSOLL-RAND, 50 CFM, 600 PSI, Model 30, with Westinghouse Motors, 15 HP, 230 DC.

CHICAGO-PNEUMATIC, 161 CFM, 100 PSI, 40 HP, 230 DC.

WESTINGHOUSE Air Brake, 246 CFM, 140 PSI, with 50 HP Motors, 440/3/60.



WORTHINGTON, 175 CFM, 125 PSI, with 50 HP Motors, 440/3/60.

JOY, Class WG82, 2-stage rated 100 CFM at 300 PSI, water cooled, size 7" x 3⅜" x 7" with Reliance motor, 30 HP, 220/440/AC/3/60.

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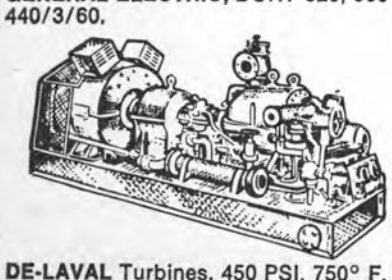
WORTHINGTON Turbines, Form S-4, 440 PSI, 740°F, driving on same common shaft a 250 KW Generator, 440/3/60, and a 90 KW Generator, 125 Volts DC.

WORTHINGTON Turbines, Form S-4, 440 PSI, 740° F, with Crocker-Wheeler Generators, 300 KW, 120/240 Volts DC.

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



DE-LAVAL Turbines, 450 PSI, 750° F, with Crocker-Wheeler Generators, 300 KW, 120/240 DC.

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

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

GENERAL ELECTRIC Turbine, Type FN3-FN24, Steam 265#G., Serial 54110, with G.E. Generator, 750 KW, 440/3/60, Frame 985 Y, Serial 580447.

2—G.E. DORV Turbines, with G.E. Generators, 200 KW, 440/3/60.

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2—220 HP, G.E., Type CDM—1348S, Form HA, Model 25G 339, 1800 RPM, Stab. Sh. Wd. Horizontal, 2 B.B.

6—100 HP, Westinghouse, Type SK, FR. 163, Style 1B4631 1150 RPM, Shunt Wd. Horizontal, 2 B.B.

2—55 HP, Electro-Dynamic, FR 25-SL, 550 RPM, Compound Wound, Single Ball Bearing. Originally for high pressure Air Compressor.

1—40 HP, Allis-Chalmers, 1750 RPM, Compound Wound, Horizontal, 2 B.B.

1—65 HP, WESTINGHOUSE, 560 RPM, Type CK, Form 10, 260 Ampere, B.B., D.P., Compound Wound.

2—220 HP, G.E., 1800 RPM, Type CDM-13485, Model 25G 339, 775 Ampere, B.B., D.P., Stab. Shunt.

4—9.3 HP, Westinghouse, 640/852 RPM, Type SK, FR. 93.

52—WESTINGHOUSE 50 HP

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Worthington	300 KW
De Laval	300 KW
Hendy (Terry Design)	300 KW
Westinghouse (Victory type)	300 KW
Westinghouse	250 KW
Worthington	150 KW
Westinghouse CA 20	100 HP
G.E. Main Turbine Rotor T2	6000 HP
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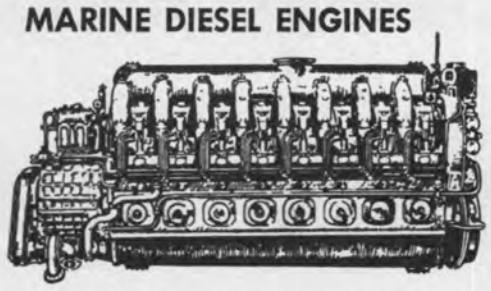

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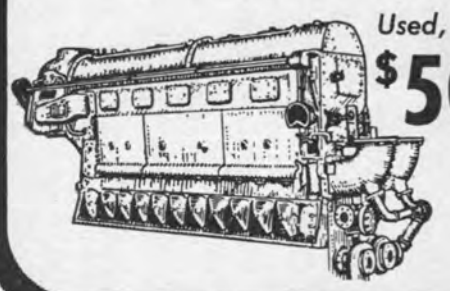

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NOTICE TO CONTRACTORS

WASHINGTON STATE
HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS
OLYMPIA, WASHINGTON 98501

MARCH 1, 1971

Sealed bids will be received by the Washington State Highway Commission at Olympia, Washington on Thursday, April 29, 1971, until 10:00 A.M. and will then and there be opened and publicly read for the construction of the following improvement:

ALTERNATE DESIGNS FOR CROSS-SOUND FERRIES

Bid proposals delivered in person will be received only at the Department of Highways Reception Desk located on the first floor of the Highway Administration Building, Olympia, Washington.

All bid proposals shall be accompanied by a bid proposal deposit in cash, certified check, cashier's check or surety bond in an amount equal to five per cent (5%) of the amount of such bid proposal.

Should the successful bidder fail to enter into such contract and furnish satisfactory performance bond within the time stated in the specifications, the bid proposal deposit shall be forfeited to the State of Washington.

Prequalification of bidders is required. Shipbuilders must obtain their initial set of plans and specifications from this office. Plans and specifications will be provided upon request therefor, and will be forwarded to the applicant by Air Express or Parcel Delivery Service. Payment of a non-refundable plan rental fee in the amount of one hundred fifty dollars ($150.00) is required for each set of plans and specifications issued. Payment shall be made to the Director of Highways **IN ADVANCE** by cash, certified check, cashier's check or money order.

Any additional sets of plans that shipyards may desire and all plans required by subcontractors and materials suppliers must be obtained through the office of the Naval Architect, Philip F. Spaulding and Associates, Inc., 65 Marion Street, Seattle, Washington 98104, Telephone MAin 2-4954.

Informational copies of plans and specifications are on file in the office of the Washington State Ferries, Pier 52, Seattle, Washington; the office of Philip F. Spaulding and Associates, 65 Marion Street, Seattle, Washington and the Director of Highways, Highway Administration Building, Olympia, Washington, where they may be inspected:

The improvement for which bids will be received is as follows:

1. Constructing Two Passenger and Vehicle Carrying Cross-Sound Ferry Vessels for the Washington State Ferries, ALTERNATE DESIGNS FOR CROSS-SOUND FERRIES, a State Project, involving a Base Bid for Construction of Two 440' Vessels with an Alternate Bid for Construction of Two 384' Vessels and an Alternate Bid for Construction of Solariums.

GEORGE D. ZAHN
Chairman

G. H. ANDREWS
Director of Highways

BUYERS DIRECTORY

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Carrier Air Conditioning Co., Carrier Parkway, Syracuse, N.Y. 13201
Union Carbide Corp., Linde Div., 270 Park Ave., N.Y., N.Y. 10017

ANCHORS AND ANCHOR CHAINS
Baldt Anchor, Chain & Forge, P.O. Box 350, Chester, Pa. 19016
Lockstadt Co., Inc., 179 West 5th St., Bayonne, N.J. 07002

BEARINGS
BJ Marine Bearings, a Borg-Warner Industry, P.O. Box 2709, Terminal Annex, Los Angeles, Calif. 90054
Glacier Metal Co. Ltd., Alperton, Wembley, Middlesex, England.
Johnson Rubber Co., Marine Division, Middlefield, Ohio 44062
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

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

BOW THRUSTERS
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171

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

BURNERS—Oil
Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y. 11231

CABLE ELECTRIC MARINE
L. F. Gaubert & Co., 700 So. Broad St., New Orleans, La. 70150

CLUTCHES, GEARS & BRAKES
Amarillo Gear Co., 517 No. Polk St., Amarillo, Texas 79105
Fawick Airflex Div. Power Transmission Systems, 9919 Clinton Rd., Cleveland, Ohio 44111
Wichita Clutch Co., Inc., Wichita Falls, Texas 76307

COATINGS—Protective
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144
Enjay Chemical Company, 60 West 49th St., New York, N.Y. 10020
Farboil Company, 90 West St., N.Y., N.Y. 10006
Intercoastal Corp., 2320 Edgewater Ave., Baltimore, Md. 21222
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.
Porter Paint Co., Louisville, Ky. 40201
Spee-Flo Co., 4631 Winfield Rd., Houston, Texas 77039

CONTAINERS—CONTAINER HANDLING SYSTEMS
Ameron Corrosion Control Div., Brea, Calif. 92621
Lighter Aboard Ship, Inc., 225 Baronne St., New Orleans, La. 70112
Paceco, Div. Fruehauf Corp., P.O. Drawer E, Alameda, Calif. 94501
RPC Corp., Marine Sales, 200 Park Ave., New York, N.Y. 10017
Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98421
York Trailer Ltd., Corby, Northants, England

CONTAINER LASHINGS & COMPONENTS
American Engineered Products Co., Box 74, McKees Rocks, Pa. 15136
W. W. Patterson Co., 830 Brocket St., Pittsburgh, Pa. 15233
Pro Par Div. Fruehauf Corp., 10940 Harper Ave., Detroit, Mich. 48232
Seasafe Transport AB, Torstenssonsgatan 3, S 114 56 Stockholm, Sweden

CONTROL SYSTEMS
Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215
General Electric Industry Control Dept., Salem, Virginia
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913
Kongsberg Systems, Inc., 10 De Angelo Dr., Bedford, Mass. 01703
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

CORROSION CONTROL
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144
Corrosion Dynamics, 1100 Walnut St., Roselle, N.J. 07203
Intercoastal Corp., 2320 Edgewater Ave., Baltimore, Md. 21222
Radiator Specialty Co., 1400 Independence Blvd., Charlotte, N.C. 28205

CRANES—HOISTS—DERRICKS—WHIRLEYS
ASEA Marine, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Duchess Baker Mfg. Co., Superior, Wis.
Hoffman Rigging & Crane Service, 560 Cortlandt St., Belleville, N.J. 07109
Kocks Pittsburgh Corp., Four Gateway Center, Pittsburgh, Pa. 15222
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 1010 Third Ave., New York, N.Y. 10021
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany
Paceco, Div. Fruehauf Corp., P.O. Drawer E, Alameda, Calif. 94501
Hensen-Rotterdam, P.O. Box 5040, Rotterdam, Holland
Star Iron & Steel Co., 326 Alexander Ave., Tacoma, Wash. 98401

DECK COVERS (METAL)
Lockstad Co., Inc., 179 W. 5th Street, Bayonne, New Jersey 07002
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Pyrate Mfg. Co., Inc., 222-17 Northern Blvd., Bayside, N.Y. 11361

DECK MACHINERY—Cargo Handling Equipment
ASEA Marine, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Blackburn Marine Equipment, 6105 England St., Houston, Tex. 77021
Duchess Baker Mfg. Co., Superior, Wis.
Lidgerwood Mfg. Co., (Superior Lidgerwood Mundy Corp.), 1010 Third Ave., New York, N.Y. 10021
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202
Red Fox Machine & Supply Co., P.O. Drawer 640, New Iberia, La. 70560
A. G. Weser, Seebeckwerft, 2850 Bremerhaven 1, Germany
Western Gear Corp., Heavy Machinery Div., Everett, Wash. 98201

DIESEL ACCESSORIES
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
Kiene Diesel Accessories, Inc., P.O. Box 216, Franklin Park, Ill. 60131

DIESEL ENGINES
Bruce GM Diesel, Inc., 180 Route #17 S. at Interstate 80, Lodi, N.J. 07644
Caterpillar Tractor Co., Industrial Div., 100 N.E. Adams St., Peoria, Ill. 61602
Colt Industries Inc., Power Systems Div., Beloit, Wisc. 53511
Electro-Motive Division General Motors, La Grange, Illinois 60525
Fiat, Turin, Italy, U.S.A. 375 Park Ave., New York, N.Y. 10022
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany.
Nohab, Trollhattan, Sweden.

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

DOORS—Watertight—Bulkhead
Overbeke-Kain Co., 209 Aurora Rd., Bedford, Ohio 44014
Walz & Krenzer, Inc., 20 Vesey St., New York, N.Y. 10007

ELECTRICAL EQUIPMENT
Arnessen Electric Co., Inc., 335 Bond St., Brooklyn, N.Y.
Galbraith-Pilot Marine Corp., 600 4th Ave., Brooklyn, N.Y. 11215
L. F. Gaubert & Co., 700 So. Broad St., New Orleans, La. 70150
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014
Pauluhn Electric Mfg. Co. Inc., P.O. Box 12805, Houston, Tex. 77017

EVAPORATORS
Aqua-Chem, Inc., 225 N. Grand Ave., Waukesha, Wis. 53186
Bethlehem Steel Corp., Shipbuilding, 25 B'way, N.Y., N.Y. 10004
Mechanical Equipment Co., Inc., 861 Carondelet St., New Orleans, La. 70130

FITTINGS & HARDWARE
hi-shear Corp., 2600 Skypark Drive, Torrance, Calif. 90509
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202
Robvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

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

GALLEY RANGES
Elisha Webb & Son Co., 136 So. Front St., Philadelphia, Pa. 19106

HEAT EXCHANGES
Aqua-Chem. Inc., 225 N. Grand Ave., Waukesha, Wis. 53186

HEATERS—Ship
Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y. 11231
Valad Elec. Heating Co., 71 Cortlandt St., Tarrytown, N.Y. 10591

HYDRAULICS
Bird Johnson Co., 883 Main St., Walpole, Mass. 02081
Vickers, M&O Div., Troy, Mich. 48084

INSULATION—Marine
Bailey Carpenter & Insulation Co.,Inc.,74SullivanSt.,Brklyn,N.Y.11231

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

MACHINE SHOP—TROUBLE SERVICE
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231

MACHINERY MONITORS
IRD Mechanalysis, Inc., 6150 Huntley Rd., Columbus, Ohio 43229

MARINE DRIVES—GEARS
Hydro Drive Corp., 4420 - 14th Ave. N.W., Seattle, Wash. 98107
Philadelphia Gear Corp., Schuylkill Expressway, King of Prussia, Pa. 19406
Western Gear Corp., Industrial Products Div., P.O. Box 126, Belmont, Calif. 94003

MARINE NAVIGATION EQUIPMENT & AIDS
Dynel Electronics Corp., 75 Maxess Road, Melville, N.Y. 11746
Edo Western Corp., 2645 So. 2nd St., W. Salt Lake City, Utah 84115
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016
ITT Mackay Marine, 133 Terminal Ave., Clark, N.J. 07066
Marquardt Corp., 16555 Saticoy St., Van Nuys, Calif. 91406
National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo.
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.
Tracor, Inc., 6500 Tracor Lane, Austin, Texas 78721

MARINE EQUIPMENT
Adsco Div., 34 Milburn St., Buffalo, N.Y. 14212
Beaver Tool & Machine Co., P.O. Box 94717, 525 S.E. 29th St., Oklahoma City, Okla. 73109
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
Kearfott Marine (Div. of The Singer Co.) 21 West St., New York, N.Y. 10006
Chas. Lowe Co., 6340 Christie Ave., Emeryville, Calif. 94608
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
Stow Mfg. Co., 225 Shear St., Binghamton, N.Y. 13902
Vokes Filter Div. (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221

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

MARINE INSURANCE
Adams & Porter, Cotton Exchange Bldg., Houston, Texas
Midland Insurance Co., 29 Broadway, New York, N.Y. 10006

MARINE LIGHTS
Natale Machy. & Tool Co., Box 95, Carlstadt, N.J. 07022

MARINE PROPULSION
Buehler Corp., 9000 Precision Drive, Indianapolis, Ind. 46236
Combustion Engineering, Inc., Windsor, Connecticut 06095
De Laval Turbine, Inc., 853 Nottingham Way, Trenton, N.J. 08602
General Electric Co., Gas Turbine Dept., Schenectady, N.Y. 12305
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171
Port Electric Turbine Div., 155-157 Perry St., New York 10014
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Western Gear Corp., Precision Products Div., P.O. Box 190, Lynwood, Calif. 90262

MARINE RADIO COMMUNICATIONS EQUIPMENT
Collins Radio Co., M/S 416-118, Dallas, Texas 75207
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016
ITT Mackay Marine, 133 Terminal Ave., Clark, N.J. 07066
E. F. Johnson Corp. Waseca, Minn. 56093
Paul J. Plishner, 45 West 45 St., New York, N.Y. 10036
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
Raytheon Marine Products Operation, 213 East Grand Avenue, South San Francisco, California 94080
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101

NAVAL ARCHITECTS AND MARINE ENGINEERS
BG Marine Services, Div. of Genge Industries, Inc., 4419 Van Nuys Blvd., Sherman Oaks, Calif. 91403
Best & Associates, 9870 S. W. 81 St., Miami, Florida 33143
Breit Engrg. Inc., 441 Gravier St., New Orleans, La. 70130
Coast Engineering Co., 711 W. 21st St., Norfolk, Va. 23517
Commercial Radio Sound Corp., 652 First Avenue, N.Y., N.Y. 10016
Crandall Dry Dock Engrs., Inc., 238 Main St., Cambridge, Mass. 02142
Cushing & Nordstrom, 50 Trinity Place, New York, N.Y. 10006
Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119
Designers & Planners, Inc., 114 Fifth Ave., New York, N.Y. 10011
M. Mack Earle, 103 Mellor Ave., Baltimore, Md. 21228
Christopher J. Foster, 17 Battery Place, New York, N.Y. 10004
14 Vanderventer Ave., Port Washington, N.Y. 11050
Friede and Goldman, Inc., 225 Baronne St., New Orleans, La. 70112
Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110
Morris 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
Farboil 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
Houttin-Pompen N. V. Sophialaan 4, Utrecht, Holland
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
International Nickel Co., 1 New York Plaza, New York, N.Y. 10004

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
Blount Marine Corp., P.O. Box 360, Warren, Rhode Island 02885
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Dillingham Corp., P.O. Box 3288, Honolulu, Hawaii 96801
Drava Corporation, Neville Island, Pittsburgh 25, Pa.
Equitable Equipment Co., Inc., P.O. Box 8001, New Orleans, La. 70122
General Dynamics, Electric Boat Division, 99M Eastern Point Road, Groton, Conn. 06340
General Dynamics, Quincy Division, Quincy, Mass. 02169
Gotaverken American Corp., 39 Broadway, New York, N.Y. 10006
Grafton Boat Co., Inc., Grafton, Ill. 62037
Groignard Shipyards, P.O. Box 829 Colbert, Marseilles, France.
Gunderson Bros. Engrg. Corp., 4700 N.W. Front St., Portland, Oregon 97208
Halter Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126
Havre de Grace, Havre de Grace, Md.
Hillman Barge & Construction Co., Grant Bldg., Pittsburgh 19, Pa.
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
O.A.R.N. (officine Allestimento e Riparazioni Navi) Genoa, Italy
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

SWITCHBOARDS
Hose McCann Telephone Co., Inc., 524 West 23 St., N.Y., N.Y. 10011

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., Mail 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

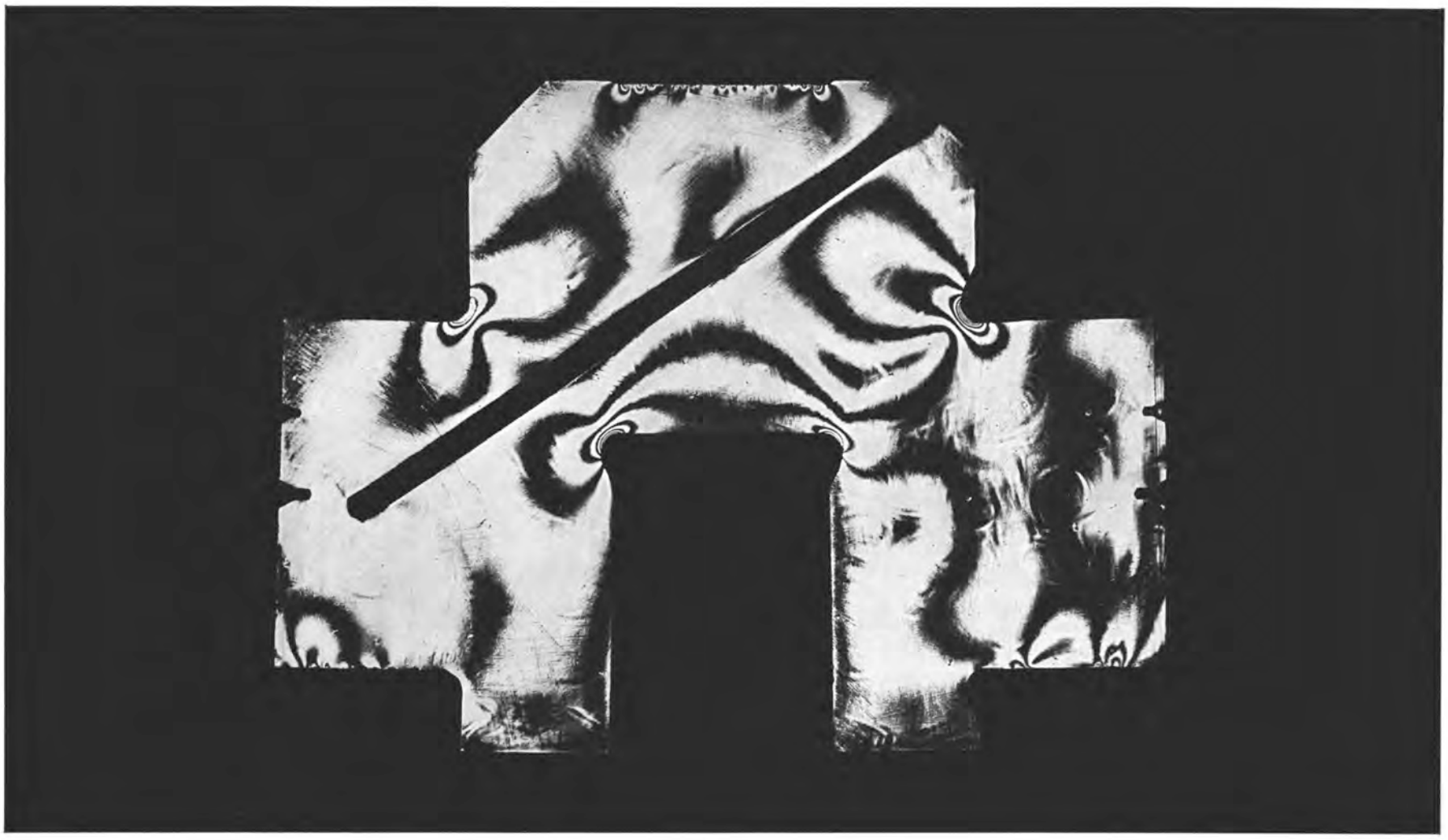
WINCHES
Skagit Corp., Box 151, Sedro Woolley, Wash. 98284

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

WIRE ROPE FITTINGS
Esco Corp., 2132 N.W. 25th Ave., Portland, Ore. 97210

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

M.A.N.'s Research Program: Strength Analysis



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1. At the development stage, the stress sources are determined by means of photo-elastometry and subsequently eliminated.
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