MARITIME
REPORTER
AND
ENGINEERING NEWS

Second Of Three 38,300-Dwt Tankers For Margate Launched At National Steel And Shipbuilding —Over 12,000 Attend Open House At Yard

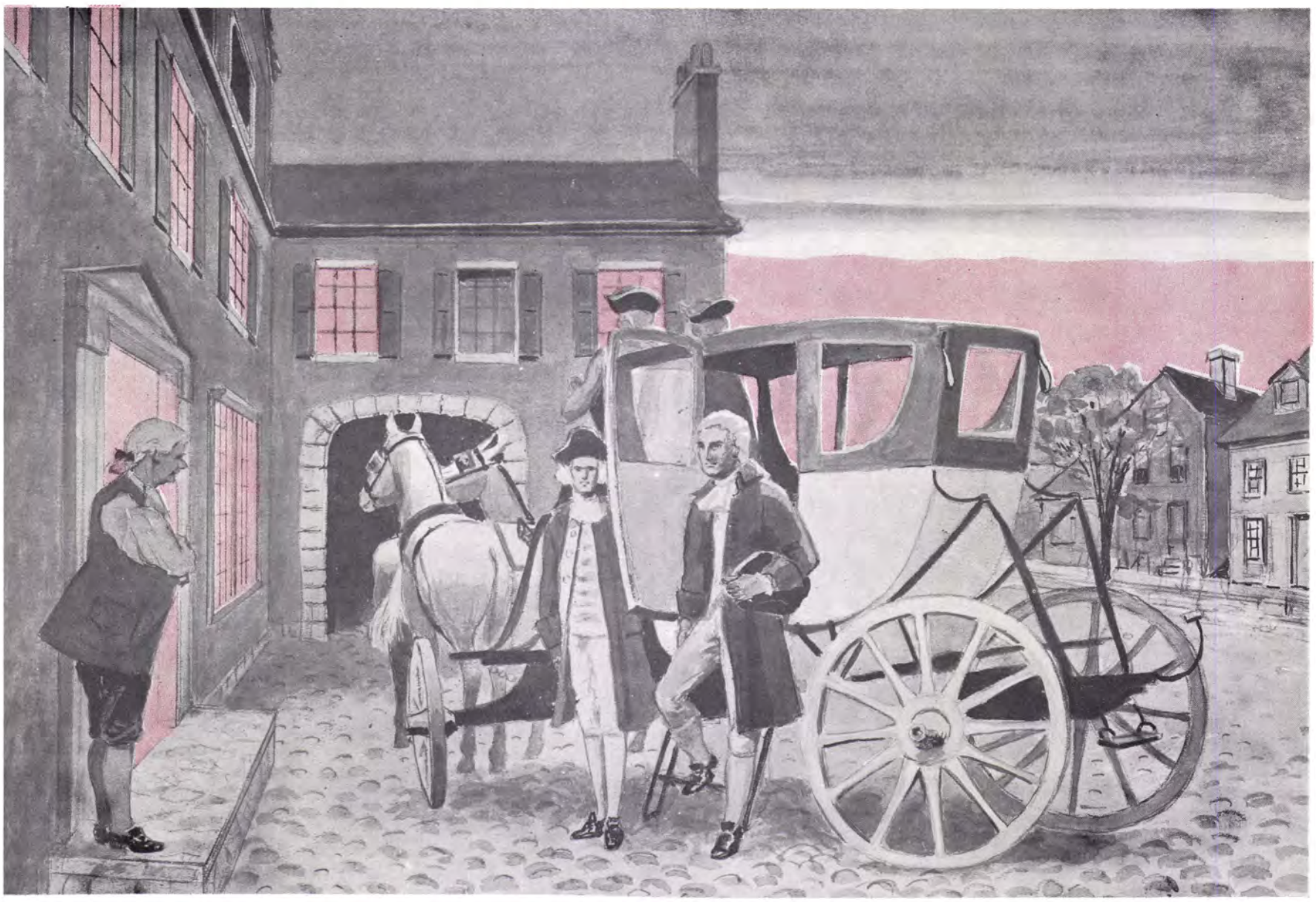
(SEE PAGE 6)

APRIL 15, 1974

George Washington did more than sleep in a different bed each night

He was a surveyor, tobacco planter, operator of a fishery and a flour mill, a breeder of cattle, an attorney and of course, the Father of His Country.

He probably never threw a stone across the broad Rappannock River nor chopped down his father's cherry tree. But, Henry "Lighthorse Harry" Lee, one of his officers, summed up the way Americans felt about him..."First in war, first in peace and first in the hearts of his countrymen."



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AWO Quarterly Meeting Set For May 14-15 In San Francisco, Cal.

The spring quarterly meeting of the American Waterways Operators board of directors will be held May 14-15, 1974, at the Mark Hopkins Hotel in San Francisco, Calif.

Any committee meetings that are scheduled will be held on the morning of May 14.

The board of directors meeting will be held starting at 2 p.m. on the afternoon of May 14, and will resume at 9 a.m., May 15. AWO will host a reception and luncheon that day.

A highlight of the meeting will be a cruise in San Francisco harbor and a visit to Alcatraz Island on the evening of May 14. Arrangements for this event are being made by **Thomas B. Crowley,** president, Crowley Launch and Tugboat Company, Pier 50, San Francisco, Calif. 94107.

'Call For Papers' For 1975 Offshore Technology Conference

A "call for papers" has been issued for the 1975 Offshore Technology Conference by **Claude R. Nielon,** chairman of the 1975 OTC Program Committee.

The Seventh Annual Offshore Conference will be held May 4-7, 1975, at the Astrohall in Houston, Texas. Mr. **Nielon,** who is with Armco Steel Corp. in Houston, heads the 12-man committee that will formulate the program for the interdisciplinary meeting. Abstracts for proposed papers should be submitted, along with a completed Data Reporting Form, to Mr. **Nielon** at Box 723, Houston, Texas 77001, or to the Program Manager, Offshore Technology Conference, 6200 North Central Expressway, Dallas, Texas 75206. Deadline for submission of abstracts for consideration on the 1975 OTC program is September 15, 1974. Copies of the Data Reporting Forms are available from the OTC headquarters in Dallas.

The Offshore Technology Conference is an interdisciplinary meeting devoted to the development of offshore resources and the protection of the ocean environment. More than 25,000 persons are expected to attend the Sixth Annual Offshore Conference scheduled for May 6-8, 1974, at the Astrohall in Houston.

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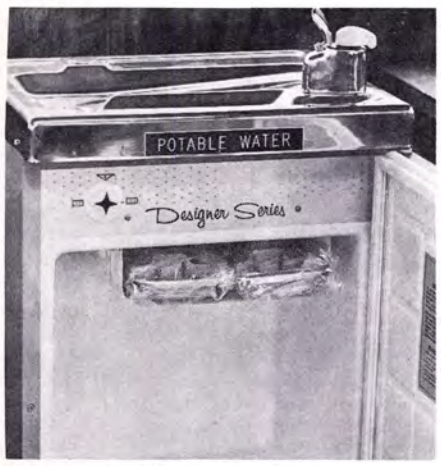


cool-box in control room

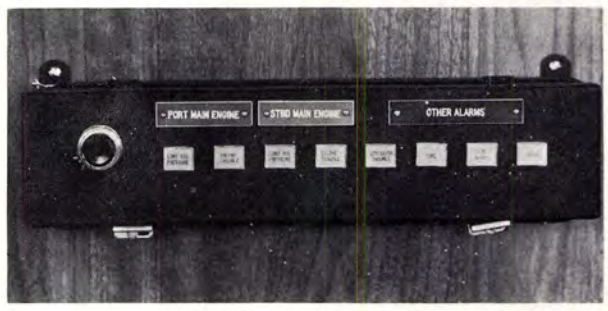

officers' lounge


complete communications system


spacious galley


solid Jeffboat construction


semi-private room

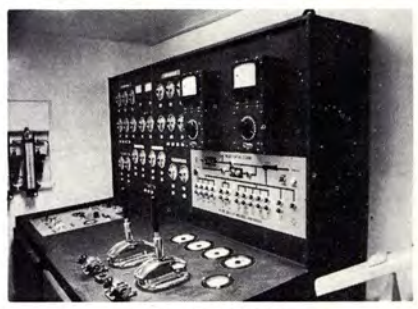


computerized warning system


step-saving panel

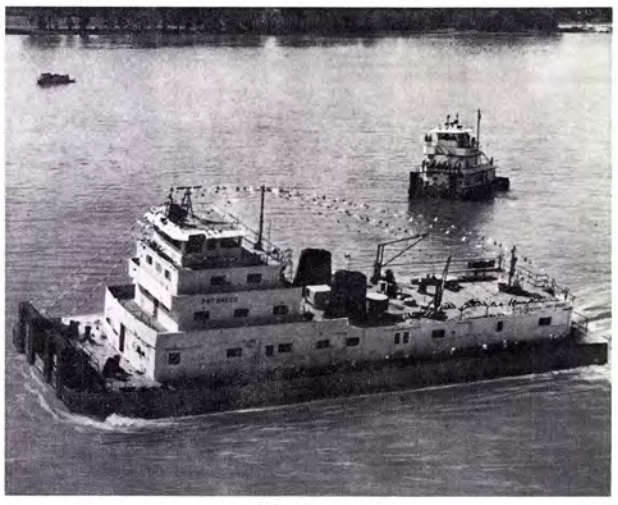

fathometer

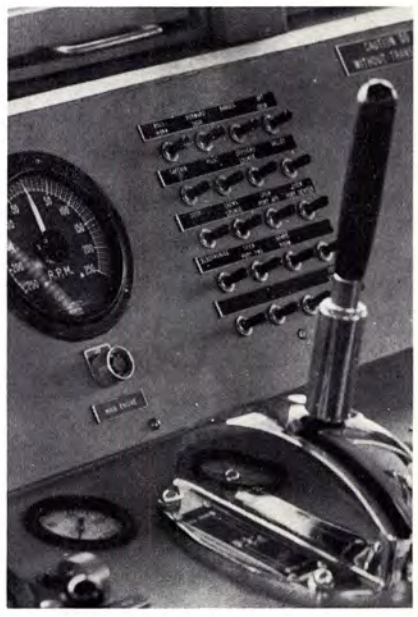

air conditioning throughout


auxiliary controls


Sperry Mark 16 radar


5,600 horse power


work-horse design


main control panel


generator

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Dignitaries present for the launching of the S/S Cherry Valley included, from the left: **John M. Murphy,** vice president, sales, National Steel and Shipbuilding Company; the Honorable **Lionel Van Deerlin,** U.S. Congressman, 37th District, California; the Honorable **Henry B. Turner,** Assistant Secretary of Commerce for Administration; **John V. Banks,** president, National Steel and Shipbuilding Company; **Miss Judith Sarah Ryan,** maid of honor; **Mrs. Robert J. Blackwell,** sponsor; **E.E. Bowyer,** director, Shell International Marine, Ltd.; **Adolph B. Kurz,** president, Margate Shipping Company, and the Honorable **Robert J. Blackwell,** Assistant Secretary of Commerce for Maritime Affairs.

Audience Of 12,000 Attends National Steel And Shipbuilding Launching Of Tanker For Adolph Kurz

The 38,300-dwt tanker S/S Cherry Valley, second of three sister ships for Margate Shipping Company, was launched at National Steel and Shipbuilding Company (NASSCO), San Diego, Calif., on March 9, 1974.

The launching of the S/S Cherry Valley was part of the festivities of NASSCO's family open house. Music began at 9 a.m. Tours, movies, food and refreshments, entertainment, prizes, and balloons were highlights of the day. More than 12,000 participated in the colorful events.

Immediately following the launching, the keel was laid for the S/S Chelsea by **E.E. Bowyer,** director, Shell International Marine, Ltd.

Mrs. Robert J. Blackwell was the new ship's sponsor. Her sister, **Miss Judith Sarah Ryan,** served as maid of honor. **Mrs. Blackwell** is the wife of the Assistant Secretary of Commerce for Maritime Affairs, who previously on June 30, 1973, officiated at the keel-laying of the S/S Cherry Valley.

Others participating in the colorful ceremonies including the Reverend Dr. **Robert H. Mayo,** pastor, First Presbyterian Church, San Diego; **Adolph B. Kurz,** president, Margate Shipping Company; the Honorable **Lionel Van Deerlin,** Representative, 37th District, California; the Honorable **Henry B. Turner,** Assistant Secretary of Commerce for Administration; **John V. Banks,** president, NASSCO, and **John M. Murphy,** vice president, sales, NASSCO.

On January 4, 1972, President **Richard M. Nixon** visited NASSCO and announced the award of a contract for the construction of three Coronado Class Tankers for Margate Shipping Company. Coronado Class Tankers were named after the Crown City of Coronado, Calif., and the S/S Cherry Valley, scheduled for delivery on August 9, 1974, is the second of the class. The S/S Coronado is now in service, and the S/S Chelsea is scheduled for delivery on March 14, 1975. When completed, the three tankers will be time chartered to Shell International Petroleum Company, Ltd.

The new ship designed by NASSCO as the Coronado Class Tanker is 38,300-dwt, 688 feet in length, 90 feet in beam, and has a 47-foot molded depth. Propulsion will be a single-screw steam turbine for a sustained speed of 16 knots. The latest in automation has been designed in the ship's operational controls. A console in the engine room provides remote control of the plant after manual start-up, while a console in the wheelhouse controls engine speed and direction.

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

After the launch of the Cherry Valley, the keel was laid for a sister ship, the S/S Chelsea. Shown, left to right: **Adolph B. Kurz,** president, Margate Shipping Company; **John V. Banks,** president, NASSCO; the Honorable **Robert J. Blackwell,** Assistant Secretary of Commerce for Maritime Affairs; **E.E. Bowyer,** director, Shell International Marine, Ltd., keel-layer; **Mrs. Bowyer,** and **G.C. Edwards,** assistant superintendent, welding, the National Steel and Shipbuilding Company.

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Offshore Conference Plans Session On Arctic Ice Exploration

The hazardous and costly aspects of Arctic sea ice projects will be one of the topics of discussion in a technical session on "Arctic Technology" at the Sixth Annual Offshore Technology Conference, May 6-8, 1974, at the Astrohall in Houston, Texas.

John J. Guthrie, with Petty-Ray Geophysical, Inc. in Calgary, Alberta, Canada, proposes that the Arctic will inevitably play an important part in satisfying the world's energy needs. The paper "Sea Ice Exploration—The Last Frontier," to be presented by Mr. **Guthrie,** will provide a brief look at past efforts, along with some of the newer approaches in Arctic sea ice transportation, camp accommodations, and operations. These topics will be discussed in relation to increasing costs, while maintaining man's safety on sea ice projects as a prime consideration.

A study of the total task force required for exploration in the offshore Arctic and the feasibility of using nuclear power in support ships will also be presented during the session. **James C. Schaff,** with Global Marine Engineering Co. in San Diego, Calif., and **Carl W. Connell,** with Babcock & Wilcox Co. in Lynchburg, Va., will present the paper describing the economic advantages of nuclear power over fossil-fueled ships.

A synopsis of industry/Government investigations into the water pollution aspects of drilling fluid waste disposal in Canada's Arctic will be presented by **Wayne J. Bryant,** with Environment Canada in Edmonton, Alberta, and **Jack Goldburn,** with Imperial Oil Ltd. in Edmonton. The objectives of this program are to determine the magnitude of the water pollution and, as a result of the investigations, to develop appropriate environmental controls for onshore and offshore disposal of drilling wastes.

Other papers scheduled for presentation during the "Arctic Technology" session include: "Fracture of Sea Ice Sheets," by **Mohammad M. Mohaghegh,** with the University of Washington in Seattle; "Arctic Coastal Sea Ice Dynamics," by **J.C. Rogers, W.M. Sackinger,** and **R.D. Nelson,** with the University of Alaska in Fairbanks; and "Effect of Ice Thickness on Ice Forces," by **Joachim Schwarz, Kenichi Hirayama,** and **Han-Chin Wu,** with the University of Iowa in Iowa City.

The Offshore Technology Conference is an international technical meeting and exhibition devoted to the development of the world's offshore resources. The conference, which is jointly sponsored by 11 engineering and scientific societies, is expected to attract more than 25,000 persons in 1974.

Inlet Oil And ConEureka Mining Planning Merger

William D. Folta, president of Inlet Oil Corporation, Dallas, Texas, and **James E. Hogle,** president of Consolidated Eureka Mining Company, Salt Lake City, Utah, have announced the signing of a letter of intent to merge or otherwise consolidate ConEureka into Inlet. It is presently contemplated that shares of ConEureka will be converted into Inlet common stock at a ratio of approximately 40 shares of ConEureka to one share of Inlet. The proposed merger is subject to the negotiation and execution of definitive agreements and the approval of the boards of directors and stockholders of both companies. Stockholders' meetings to consider the proposed merger are expected in late spring or early summer.

Inlet is a privately held natural resource company engaged in the exploration for oil and gas and in barite mining and marketing. Inlet's oil and gas exploration activities are primarily in Alaska, U.K. North Sea, Gulf of Thailand and offshore eastern Canada. ConEureka's primary assets consist of patented and unpatented mining claims in Eureka County, Nev., and 8,261 shares of Series A Preferred Shares of American Metal Climax, Inc. ConEureka's shares are listed on the Intermountain Stock Exchange, Salt Lake City.

Tidewater Marine To Acquire Pelto Oil In Merger Agreement

The managements of Tidewater Marine Service, Inc. and Pelto Oil Company have announced an agreement in principle for a merger, following which Pelto will become a wholly owned subsidiary of Tidewater. The merger is subject to the execution of definitive merger agreements and approval of the board of directors and shareholders of both Tidewater and Pelto. Under its terms, Tidewater will exchange approximately 2.8-million shares of its common stock for all outstanding Series A and B common stock of Pelto on a share-for-share basis.

In making the announcement, **John P. Laborde,** chairman and president of Tidewater, and **J.B. Storey,** president of Pelto, stated that a condition to the merger is that Southdown, Inc., which now owns all of the 1,562,500 shares of Series B common stock of Pelto, dispose of substantially all such shares through an exchange offer to its own shareholders. A spokesman for Southdown stated that the terms of a previously announced exchange offer will be modified to provide for the exchange of one share of Pelto Series B common stock for each two shares of Southdown common stock up to 3,125,000 shares of Southdown common stock, and to the extent such numbers of Southdown common stock are not exchanged, one share of Pelto stock for each share of Southdown preferred stock. The exchange offer will be made only by means of a prospectus, and will be commenced after a registration statement including such prospectus has been filed with, and approved by, the Securities and Exchange Commission. It is anticipated that such exchange offer will be concluded by May 31, 1974.

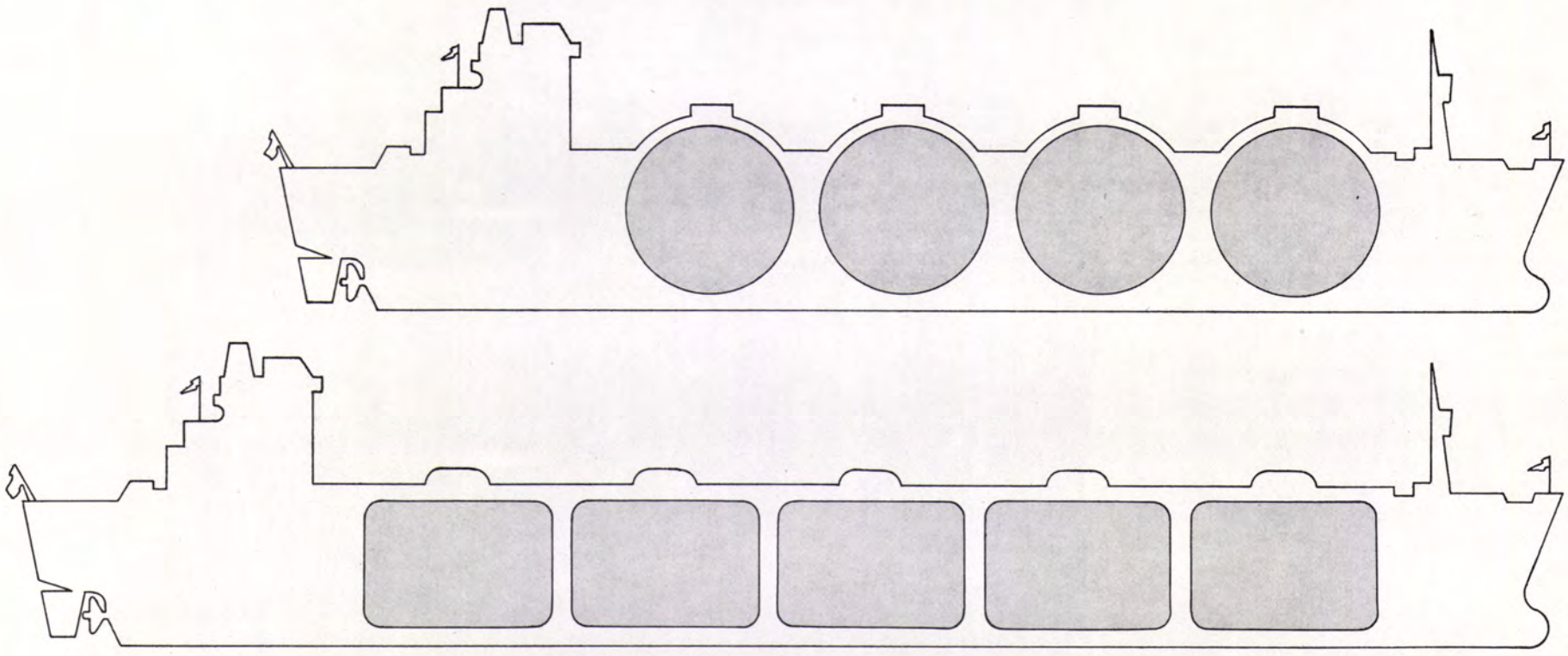
At the consummation of the merger, **D. Doyle Mize** and **W.S. Chadwick,** chairman of the board and president of Southdown, respectively, will resign their positions as chairman of the board and vice president, respectively, of Pelto.

Mr. **Laborde** stated that the acquisition of Pelto represents an attractive opportunity for Tidewater to expand and diversify its position in the oil and gas business into the domestic area; at present, Tidewater's position consists of its interests in properties located offshore northwest Java and southeast Sumatra in Indonesia. Tidewater anticipates utilizing the experience of Pelto and its staff in the oil and gas exploration and development area in managing its Indonesian interests. Tidewater also anticipates that the merger will greatly broaden the distribution of its stock and approximately double the number of its shareholders.

Tidewater, through its subsidiaries and affiliates, is principally engaged in supplying marine services and equipment to major international oil companies, domestic oil companies, service and construction companies, and other firms engaged in the exploration for, and development and production of, oil, gas and other minerals. It operates in offshore and inland waters throughout most of the free world where these activities are carried on. For the 12 months ended December 31, 1973, Tidewater stated that it had unaudited revenues of $65,116,000 and earnings of $9,424,000 ($2.40 per share), compared with revenues of $59,232,000 and earnings of $7,417,000 ($1.90 per share) for the 12 months ended December 31, 1972. The common stock of Tidewater is traded on the New York Stock Exchange.

Pelto participates with others in exploring for, developing, producing, transporting and selling oil and gas. Generally, Pelto and other companies share proportionately in the expenses and revenues in oil and gas producing and exploratory properties. Pelto has previously announced that during the year ended December 31, 1973, it had revenues of $12,613,000 and net earnings of $7,742,000 ($2.75 per share), compared with revenues of $10,225,000 and $6,410,000 in net earnings ($2.28 per share) for the year ended December 31, 1972. The common stock of Pelto is traded in the over-the-counter market.

CRYO

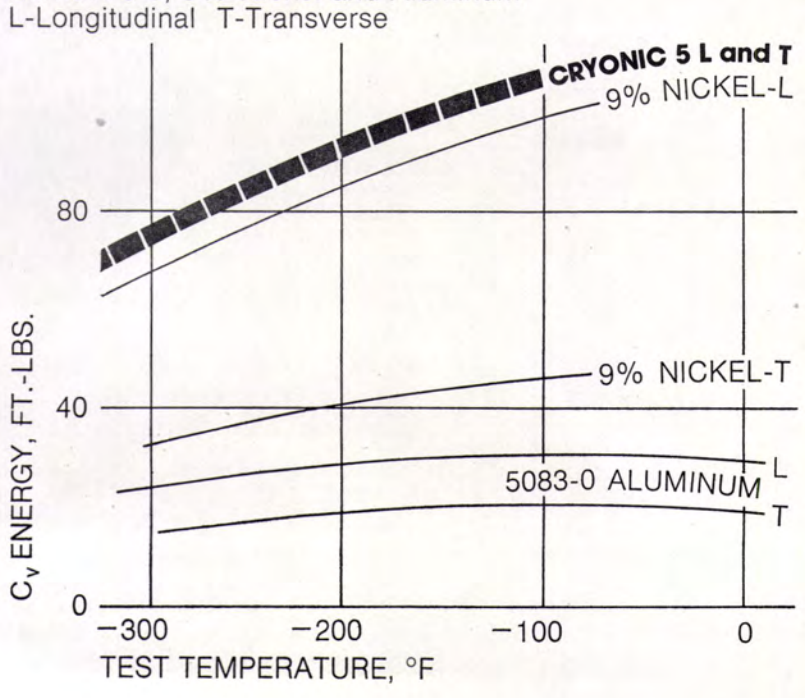


Our two ship cutaways illustrate the economic advantage of Armco CRYONIC 5 Steel. Regardless of design, for about the same material cost of four 9% nickel steel tanks, you can get five tanks of CRYONIC 5 steel. A bonus in cargo capacity. Or, in other terms, any tank built with CRYONIC 5 will reduce material cost about 20%.

In addition, this 5% nickel alloy steel has essentially the same strength and toughness as higher alloyed 9% nickel steel. In fact, no design changes are required in switching from 9% nickel tanks to Armco CRYONIC 5. The allowable design stress is the same for both steels (ASME, API).

Because of this performance capability, and CRYONIC 5 steel's major price advantage, we think it will become the standard material for liquid ethylene and methane (LNG) service.

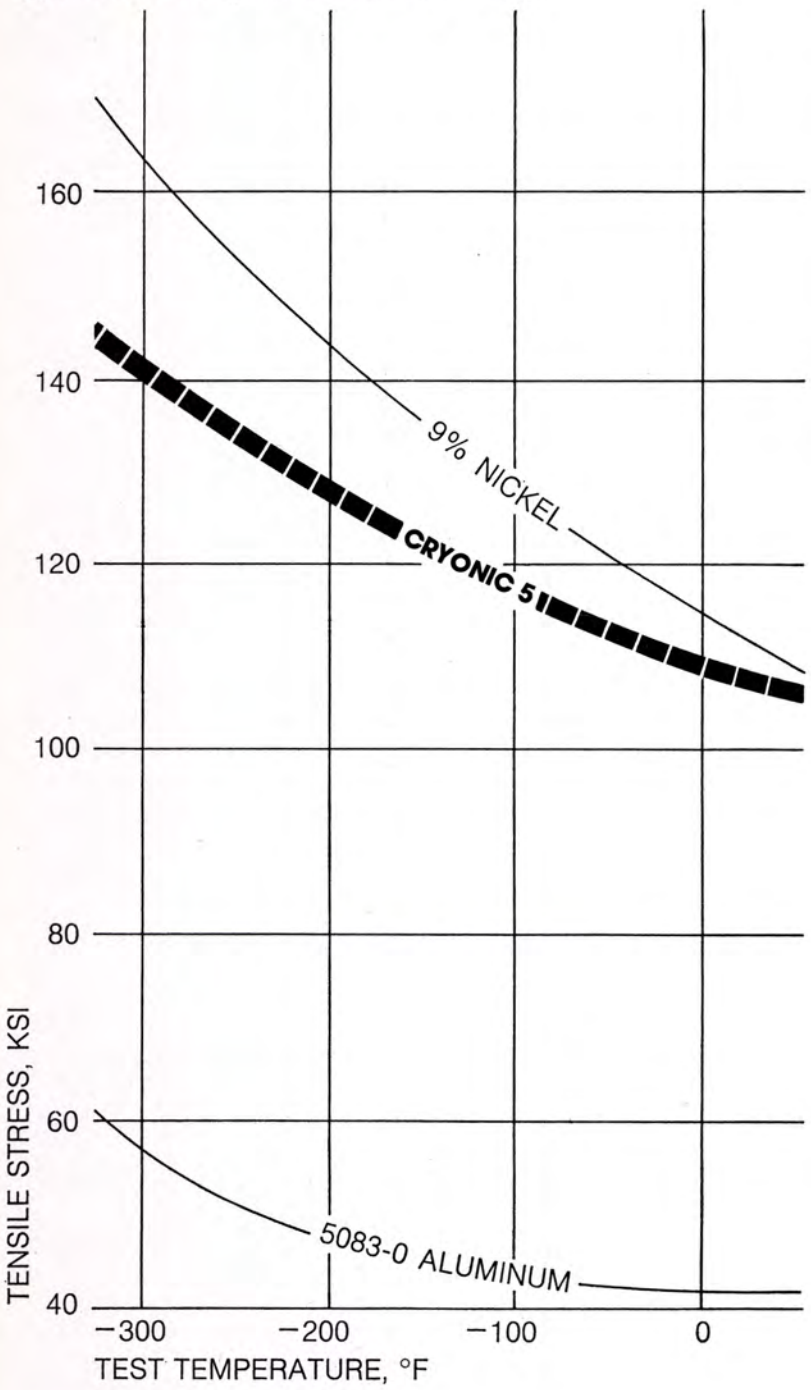
Comparison of Charpy V-Notch Toughness
CRYONIC 5, 9% Nickel and Aluminum
L-Longitudinal T-Transverse



NIC 5 STEEL

An economical breakthrough for LNG containment

Typical Low Temperature Tensile Strength



Of course, there are other important economic considerations in selecting LNG containment tank material—weldability, for example. CRYONIC 5, like 9% nickel can be joined by all commonly used welding procedures—manual, submerged-arc and gas metal-arc welding. There's more, so we are asking you to send for our new catalog *"Cryogenic Steels for Exceptional Performance."*

It contains detailed information on metallurgical and mechanical properties, notch toughness, fracture toughness, fatigue and special thermal cycling properties and a large section on welding. Other data invites comparisons of CRYONIC 5, 9% nickel steel, 5083-0 aluminum and stainless steels used in cryogenic service.

We have the data that will show you why Armco CRYONIC 5 Steel's combination of strength, toughness and lower cost makes it the logical material for LNG shipboard containment tanks. Mail the coupon and convince yourself it really is a breakthrough.

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Department H-14, Box 723
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Convince me, send your:

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☐ Armco Marine Steels Property Card, LH-873
☐ I am interested in Fatigue and Fracture Mechanics Properties

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City_____ State_____ ZIP_____

ARMCO

1974 SNAME Spring Meeting— The Future Of Domestic Shipping

The Society of Naval Architects and Marine Engineers has announced the program for the 1974 Spring Meeting. The theme is "Domestic Shipping." The meeting which is being hosted by the Great Lakes/Great Rivers Section, will be held from May 22 through 24, at the Palmer House, State and Monroe Streets, Chicago, Ill. 60690.

The meeting will start at 9:00 a.m. on Thursday, May 23rd with opening remarks by the Society President **Phillip Eisenberg.** The technical sessions will be held in the Monroe Room and the Adam Room. All lettered sessions are co-ed, an innovation for the Society, and especially prepared for a mixed group.

Thursday afternoon has been set aside for a varied choice of very interesting field tours.

Technical Papers
Thursday, May 23, 1974

Paper No. 1. "National Importance of Domestic Shipping" by **Burton Kyle.**

Synopsis — This paper outlines the role of domestic shipping in furthering the nation's commerce. The comparative merits of competing modes of transport and the Maritime Administration's policies in support of inland waterborne commerce are explained. It projects shipping needs to the year 2000 and suggests requisite developments in waterways, terminals, and floating equipment.

Paper No. 2. "Changing Patterns in the World Market for Iron Ore" by **John D. Sward.**

Synopsis — The paper examines the major traffic in iron ore throughout the world. Principal topics include points of origin and destination as well as the impact of costs of transport. Traffic to the major U.S. steel-making districts receives particular attention. Comparative costs are projected for alternative routes and modes of transport.

Paper No. 3. "Alternative Methods for Increasing the Efficiency of the Inland Waterways" by **Joseph L. Carroll, Strikanth Rao,** and **Hoyt G. Wilson.**

Synopsis — Little attention has been given to various operating changes that can significantly improve the capacity of our inland waterways. This paper highlights relatively inexpensive changes in the operation of our waterways that are likely to be highly cost effective, and that this route to system effectiveness should be vigorously investigated.

Paper A. "Bridge of Blue Water —The Alaska Ferry Service" by **Philip F. Spaulding.**

Synopsis — A movie about the passenger and auto ferries that run between Alaska and Seattle along the Alaskan Coast. The functional requirements are explained, and we are shown life aboard a typical ferry, together with some eye-filling shots of the magnificent scenery along the route.

Paper B. "Planning Within the St. Lawrence Seaway Authority" by **A. Pageot.**

Synopsis—An overview of current trends and future projections of the commerce and ships that the Seaway expects to handle in the future. Such planning is essential to maintaining adequate service in the Seaway, and ever-changing conditions require a dynamic, flexible approach.

Paper C. "Flotilla Commerce— The Great Rivers of North America" by **Robert J. Patrick.**

Synopsis—A movie depicting the pioneering transport methods developed on our rivers and canals, and the benefits to industry in the American heartland. Unique manning practices that merit emulation in deep water ships are shown to play a key role in reducing costs.

Paper D. "A Sister for the Queen" by **Paul A. Gow.**

Synopsis — An illustrated talk about the new stern wheeler designed to replace the famous old river packet Delta Queen. Although antiquated in appearance, the new vessel will incorporate all modern features in materials and methods of construction.

Friday, May 24, 1974

Paper No. 4. "Traffic Control for Merchant Ships" by **Timothy V. Johnson** and **Donald T. Ryan.**

Synopsis — Congress authorized the Coast Guard to establish, operate, and maintain vessel traffic services and systems. Developments under this authority are reviewed, and a brief look at vessel traffic systems in other nations presented. Several traffic separation schemes in international waters have been adopted by IMCO, and these developments are also reviewed. Forecast of what can be expected over the next 25 years in domestic and international marine traffic managements are made.

Paper No. 5. "Dredging in the Great Lakes—Impact of Environmental Factors" by **George A. Johnson** and **Carl C. Cable.**

Synopsis — The in-lake disposal of heavily-polluted dredgings from harbors is being replaced by disposal in diked areas ashore. A ten year program to provide diked areas at 76 harbors is underway, and is described. The paper also describes the modifications to dredging equipment required by the new disposal method.

Paper No. 6. "Great Lakes/St. Lawrence Seaway Feeder Systems: A Feasibility Study" by **Douglass S. Lathrop.**

Synopsis — This paper explores several possible feeder systems that might provide container service between Lake ports and a Canadian ocean port where trans-shipment to deepwater ships could be effected. The potential market and the competitive situation for such feeder service is discussed.

Paper No. 7. "Port Handling and Marine Transport of Hazardous Materials" by **Howard H. Fawcett, Robert B. Beckmann,** and **Donald L. Katz.**

Synopsis — The Committee on Hazardous Materials, National Research Council, is investigating the basic problems in the marine handling of hazardous materials. The paper discusses questions that have been raised relative to hazards, and summarizes information reported to the Committee.

Paper No. 8. "Designing and Building the Self-Unloader Charles E. Wilson" by **Robert H. Miller.**

Synopsis—The Wilson embodies many advanced concepts in bulk carrier design. This paper gives the details of the design and the reasoning behind the decisions. The interesting design features are a twin-diesel engine room equipped for one-man operation, unique bow and stern configurations, unusual structural arrangements, several special winter navigation features, and a versatile, automated cargo-handling system.

Paper No. 9. "Integrated Tug-Barge Versus Ship—An Economic Comparison for the Great Lakes" by **C.E. Tripp** and **G.H. Plude.**

Synopsis — The tug-barge concept is compared with the conventional ship for bulk cargo service on the Great Lakes. Topics include differences in building cost, operating cost, and annual transport capacity. The choice is shown to be affected by the individual owner's needs and commercial circumstances. The probable impact of future changes in operating environment is also considered.

Paper No. 10. "Alternative Inland Tank Barge Designs for Pollution Avoidance" by **Edward S. Karlson, Peter C. Lauridsen, Constantine Foltis,** and **Arthur C. Sargent.**

Synopsis—The Maritime Administration, Coast Guard, and the inland-oil-barge industry have jointly investigated accidental oil spills to determine the most cost effective method of prevention. A comprehensive tank barge fleet profile has been developed, oil spill information has been analyzed, life-cycle costs for nine different construction and reconstruction methods in three barge sizes have been compiled, and correlated.

Paper No. 11. "New Economic Life for the Great Lakes" by **William R. Ransom.**

Synopsis — Long-term economic problems faced by Great Lakes operators are considered. It is suggested that an extended operating season may be the best single solution. Experience gained by the U.S. Steel Corporation's fleet is outlined and the economic benefits explained. The paper suggests mutually advantageous actions for shipowners and federal agencies in exploiting the advantages of winter navigation.

Paper E. "Between Scylla and Charybdis — The Coast Guard's Role in the Marine Environment" by Rear Adm. **W.M. Benkert,** USCG.

Synopsis—A survey of the problems in finding practical ways of protecting the marine environment. Factors included are vessel construction, vessel traffic systems, aids to navigation, ports and canals, and special problems concerned with minimizing oil spills.

Paper F. "The Inconceivable Commerce—Story of Winter Navigation on the Lakes" by **William R. Ransom** and **Paul B. Mentz.**

Synopsis—A documentary film about current efforts to extend the operating season on the Lakes. Economic imperatives of winter navigation are explained. Cooperation between government, industry, and labor can bring public benefits to the nation. The movie was prepared specifically for this event.

Paper G. "Challenge of the Canadian North — Canada's Arctic Transport Service" by **Helge Tomter** and **Michael H. Bell.**

Synopsis—A movie showing the ships and operating methods used to carry supplies and equipment to Canada's frozen North. Solutions to the problem of offloading goods in undeveloped ports are nicely illustrated.

Paper H. (For Ladies Only) "Getting Ahead in a Man's World" by **Mrs. Helen Delich Bentley.**

Synopsis—An informal exchange of ideas between **Mrs. Bentley** and the all-woman audience on making a career in a man's world. **Mrs. Bentley** was a well known and influential columnist for the Baltimore Sun before going to Washington as Chairman of the Federal Maritime Commission. She played a leading role in formulating the Merchant Marine Act of 1970.

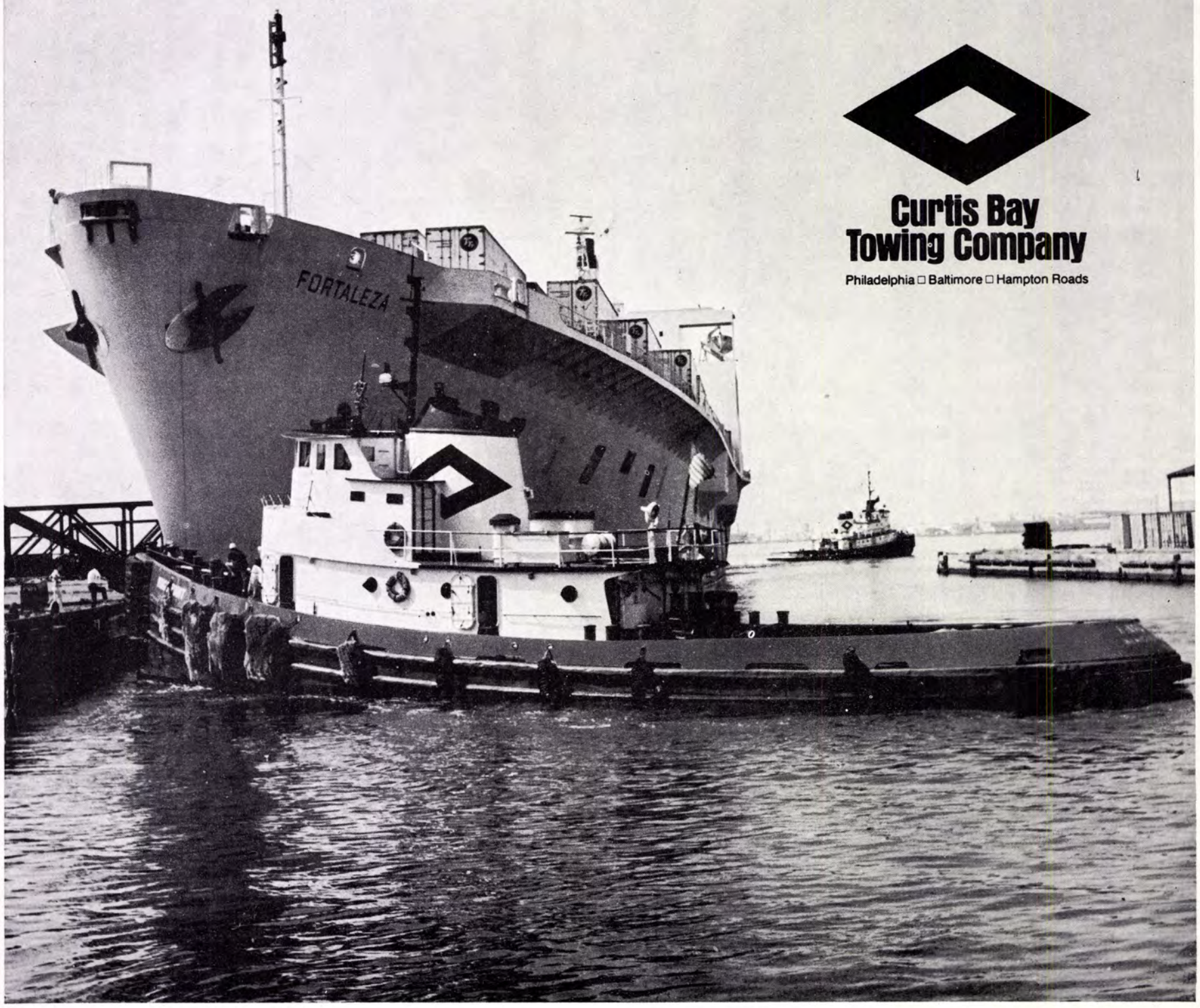
Social Events

President's Reception — Society President **Phillip Eisenberg** will be host to all registrants and their ladies at this social event on Wednesday, May 22, from 7:00 to 8:00 p.m. in the State Room of

(Continued on page 14)

THERE IS A DIFFERENCE IN TUGBOAT COMPANIES.

Equipment and personnel make that difference. The best of both are required by the FORTALEZA, shown sailing from Baltimore. Both are provided by Curtis Bay. In the photograph, the new tug CAPE HENLOPEN exerts her 3300 horsepower on the stern of the ship. The 2400 horsepower tug KINGS POINT controls the bow. Curtis Bay Towing Company, 63 years of superior service.



Curtis Bay Towing Company

Philadelphia □ Baltimore □ Hampton Roads

SNAME Spring Meeting

(Continued from page 12)

The Palmer House. Beverages will be served. No charge.

President's Dinner—Wednesday, May 22nd at 8:00 p.m. in the Grand Ballroom of The Palmer House. The Dinner will honor Society President **Phillip Eisenberg** and all past presidents of the Society. Featured on the program will be an address of national significance and the presentation of awards.

National Maritime Day Luncheon—Thursday, May 23rd at 12:00 noon in the Adams Room of The Palmer House. Preceded by a general reception from 12:00 to 12:30 p.m. in the foyer area. Featured speaker at the luncheon will be the Honorable **Robert J. Blackwell,** Assistant Secretary of Commerce for Maritime Affairs.

Night at the Empire Room—Thursday, May 23rd, at 7:30 p.m. The Empire Room is one of the last of the great superior dining clubs in the grand hotel style of this century. **Bobby Vinton** stars in the floor show, and the Norm Krone Orchestra plays for dancing.

Great Lakes/Great Rivers Day Luncheon—Friday, May 24th, in the Adams Room, preceded by a general reception in the foyer area from 12:00 to 12:30 p.m. This luncheon acknowledges the contributions made to the Society by the members from the fresh-water transportation industry. The Honorable **Helen Delich Bentley,** Chairman of the Federal Maritime Commission will be featured speaker.

Dinner Dance—Friday, May 24th, the general reception will be held in the State Room at 7:00 p.m. Dinner will be served at 8:30 p.m. in the Grand Ballroom. The Norm Krone Orchestra will provide dance music until 1:00 a.m.

Field Tours

Registrants have a choice of three tours on Thursday, May 23rd, at 2:00 p.m. Tours will depart from the Wabash Street entrance of The Palmer House. Bus transportation will be provided for all tours.

Tour No. 1. Electro Motive Division of General Motors Corp. at LaGrange. Groups will be escorted through production lines. Opportunity to observe the locomotive erection bay and diesel-generator sets for offshore drilling rigs and other marine applications will be provided.

Tour No. 2. Shipboard tour will be planned around the most interesting available ship or tug-barge in the Chicago area. Details will be announced at the meeting. A 1,000-foot vessel or the new 650-foot-class Lake ship—all self-unloaders—and the world's largest tug-barge may be included.

Tour No. 3. Chicago River Launch tour starts at Michigan Avenue bridge on special glass covered river launches. The launch will enter the Chicago lock to Lake Michigan and the Navy Pier where ocean ships load. The Chicago Sanitary and Ship Canal and the beautiful Chicago River Gateway to the Loop will be included.

Steering Committee—This outstanding program was planned under the chairmanship of **John L. Horton,** assisted by **Carlton E. Tripp,** vice-chairman and **George H. Plude** as secretary-treasurer. The balance of the Steering Committee is as follows: finance **Richard B. Couch,** chairman assisted by **Robert M. Fraser, George H. Plude,** and **Arthur J. Zuehlke;** papers and technical sessions **Harry Benford,** chairman, **John .B. Woodward III,** vice-chairman, **Robert H. Miller, Robert J. Patrick, Richard H. Suehrstedt,** and **William E. Zimmie;** program coordinator **John K. Stuart;** ladies committee, **Mrs. John K. Stuart,** chairman, **Mrs. Edgar M. Jacobsen, Mrs. Richard A. Stearn, Mrs. Richard C.G. Sorenson,** and **Mrs. Lawrence J. Sundlie;** registration, **Richard A. Nielsen;** field tours, **Leo J. Fredette** and **Lawrence J. Sundlie,** co-chairmen. Assisting the steering committee **Harry H. Kendall, Gordon Stafford, Richard A. Stearn, Benjamin F. Tracy, Jr.** and **Trevor White.**

NASSCO Elects Lents VP And Controller

J. Eldon Lents

The appointment of **J. Eldon Lents** as vice president and controller, National Steel and Shipbuilding Company (NASSCO), San Diego, Calif., has been announced by **John V. Banks,** president. Mr. **Lents** has been with NASSCO in San Diego since 1959 as controller and assistant secretary.

Mr. **Lents** is an accounting graduate of Kinman Business University of Spokane, Wash.

A veteran of over 36 years with the Kaiser organization, Mr. **Lents** started his career in 1938 as assistant camp office manager for the Grand Coulee Dam Project in Mason City, Wash. From 1942 to 1944, he served as chief accountant for Oregon Shipbuilding Corporation of Portland, Ore., and for the next five years was administrative manager for Consolidated Builders, Inc. in Portland and Mill City, Ore. He then served two years for Kaiser Engineers in Richland, Wash. During the next three years, from 1954 to 1957, he was administrative manager for a joint venture group of contractors under the sponsorship of Kaiser Engineers, division of Henry J. Kaiser Company in New South Wales, Australia.

Mr. **Lents** then returned to Oakland, Calif., where he was accounting manager, construction, for Kaiser Engineers until his assignment to NASSCO.

He is a member of the NASSCO Management Club, The Propeller Club of the United States, and The Navy League.

Litton Industries Asks $350-Million Increase On Destroyer Contract

Litton Industries confirmed that it had asked for a $350-million increase on its DD-963 destroyer contract and said it expected costs to rise $485 million above that.

The company confirmed the $350-million cost increase after it was disclosed by Representative **Les Aspin** (D-Wis.), and said this would raise the 30-ship contract to $2.15 billion. The vessels are under construction at Litton's Ingalls Shipbuilding Corporation yard in Pascagoula, Miss.

Going beyond Mr. **Aspin's** disclosure, a Litton spokesman said it estimated that rising costs of materials would add another $485 million in costs to be shared under the contract by Litton and the Navy.

Shaw Savill Orders Seven 'Mini' Bulkers

The Furness Withy Group company Shaw Savill has placed orders for seven "mini" bulkers of 3,200 deadweight tons on behalf of its subsidiary, Cairn Line. The order is worth $16.3 million at current exchange rates. Four of the ships will be built by Martin Jansen of Leer, West Germany, and three by Centromar, Poland, at their Gdansk Shipyard.

Shaw Savill chairman **Brian Shaw** commented that "we believe there is a growing requirement for this type of vessel in the middle sea area. In recent years, we have been developing this type of operation with the Cairn Line and our faith in the future of this trading pattern is demonstrated by the order."

The first vessel is scheduled for delivery from the West German yard in December of this year. Subsequent vessels will be delivered at regular intervals up to early 1977.

The seven bulkers will form part of the growing Cairn Line fleet trading in the European and middle sea areas. They will all be equipped with large hatches, facilitating the carriage of a wide range of commodities, including a substantial container-carrying capability.

Ingram, New Orleans Buys Two British Yards

Frederic B. Ingram, chairman, Ingram Corporation, New Orleans, La., recently announced in Hull, England, the acquisition of Richard Dunston Industries, Ltd., and subsidiaries by Ingram Maritime Co., Limited, a wholly owned England-based subsidiary of Ingram Corporation. Dunston operates two shipyards, one at Hessle on the Humber River, the other at Thorne on a waterway leading into the Humber.

The Hessle yard builds ocean-going vessels such as petroleum tankers and petrochemical carriers, similar to those owned by another Ingram English subsidiary, C. Rowbotham and Sons (Management) Limited, London. Rowbotham operates a tanker fleet in the British Isles and the North Sea, transporting refined petroleum products and chemicals.

The Thorne yard builds smaller vessels such as trawlers, utility boats, Navy patrol craft, and yachts.

It is contemplated that the yards will be a significant factor in Ingram's expansion of its overseas operations. This new investment substantially increases Ingram's present commitment to the maritime industry of the United Kingdom, Mr. **Ingram** said. The purchase price was not disclosed.

Aug. Kopcke & Co. BV Appoints Wesley Valfer

Wesley A. Valfer

Wesley A. Valfer, with offices at 17 Battery Place, New York, N.Y. 10004, sales representative for ship suppliers and repair facilities in the United States and Singapore, has been appointed by Aug. Köpcke & Co. B.V. as their United States representative. Köpcke maintains offices and warehouses in Rotterdam, Amsterdam and Delfzijl in Holland, and also in Antwerp, Belgium. In conjunction with these warehouses, Köpcke supplies vessels in all the European ports, the United Kingdom, Scandinavia and North Africa. Aug. Köpcke & Co. B.V. was established in 1872.

American Shipholding Plans Construction Of Six To Ten VLCCs

The First National Boston Corp., Boston, Mass., Tenneco, Inc., Houston, Texas, and Interstate Oil Transport Co., Philadelphia, Pa., have formed American Shipholding Corp. for the purpose of building and leasing six to ten 390,000-dwt very large crude carriers (VLCCs) at an estimated cost of $125 million each. A construction subsidy application has been filed with the Maritime Administration, and the vessels would be built at Newport News Shipbuilding and Dry Dock Co., a Tenneco subsidiary. **Andrew E. Gibson,** formerly Assistant Secretary of Commerce for Maritime Affairs, is president of Interstate Oil Transport Co.

Adams & Porter Elects Adams And Garone

The board of directors of Adams & Porter, Incorporated, insurance brokers and adjusters, has announced the election of **David B. Adams** as vice president/secretary, and the election of **Thomas A. Garone** as assistant vice president.

Adams & Porter, for over 65 years, has specialized in designing and servicing insurance programs for the marine industry, with correspondents throughout the world.

The company maintains offices at 5 World Trade Center, New York, N.Y. 10048, and in Houston, Texas, at 1819 St. James Place.

Bresnan Relocates Office In New York

Bresnan and Co., New York City-based ship chartering firm, has announced that it has moved its offices, and is now located in Suite 2229 at 17 Battery Place, New York, N.Y.

We have arrived

. . . by designing and building a new generation of bulk carriers . . . Our *San Clemente Class OBO's and Tankers,* our *Coronado Class Tankers,* and our *Catalina Class Tanker* are examples . . . A combination of a skilled labor force, technical competence, and innovative management have made it all possible.

NASSCO

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San Diego, California 92112
(714) 232-4011

Owned by Kaiser Industries Corporation and Morrison-Knudsen Company Incorporated

Keene Discharge Control System Affords Operator Permanent Proof Of Law Compliance On Oil Spills

A new automatic fail-safe system for removing oily pollution from bilgewater has been introduced by the Fluid Handling Division of the Keene Corporation, Cookeville, Tenn. 38501. Production models of the Keene Marine Discharge Control System™ are installed on vessels operating out of the Port of New Orleans, and according to a company spokesman "others are being installed as fast as we can deliver them in ports across the country."

The new Keene Marine Discharge Control System effectively and automatically removes oily wastes from a vessel's bilge, discharging the cleaned-up bilgewater overboard. The system includes a continuous recorder/monitor located on the vessel's bridge, providing a permanent record of bilgewater purity.

The system operates automatically. As the water level rises in the bilges, the system turns itself on and operates continuously until bilgewater is pumped down to a preset level. The system then automatically shuts itself off. A patent on the design is pending.

Passes Coast Guard Regulations —The Federal Water Pollution Control Act (FWPCA) prohibits the discharge of oil in harmful quantity into or upon the navigable water of the United States, adjoining shorelines, or into or upon the waters of the Contiguous Zone. A "harmful quantity" has been defined by EPA as that which will create a film, sheen or discoloration upon the water, or a sludge or emulsion beneath the surface of the water. To that end, the Coast Guard has recently published Oil Pollution Prevention Regulations for Vessels and Oil Transfer Facilities (33 CFR, Subchapter 0) which further addresses the question of bilge slop retention (33 CFR 155.330 through 155.360) as amplified by Navigation and Vessel Inspection Circular 9-73. The Coast Guard has endorsed the Keene Marine Discharge Control System, in that they will grant a waiver from the provisions of 33 CFR 155.330 through 155.360 to those vessels with the Keene system installed.

Answers Long-Felt Need—The new system was tested during 1973 on vessels operating both on inland waterways and Gulf coastal waters. The first production version was exhibited in November 1973 at the Marine Technology Conference in St. Louis, Mo., where it proved to be the center of attraction among vessel owners and operators. Until the new system was unveiled, marine transportation company executives, as well as the Coast Guard, expressed concern over the problem of frequent visits by vessels to port facilities to discharge bilges into shoreside disposal facilities with its attendant specter of high disposal costs, inconveniences and delays of waterborne commerce. Alternatively, vessel operators would have been forced to retain all bilgewater aboard the vessel until it could be pumped into midstream service craft or until the vessel reached its next port of call for dockside bilge discharge. Onshore facilities, particularly in the inland regions, are also recognized to be very reluctant about taking such slop.

Permanent Proof Of Law Compliance—A strong feature of the Keene Marine Discharge Control System is a continuous-time recording monitor installed on the vessel's bridge. This device automatically activates and records the day and hours the bilge system operates, and provides a permanent record of the quality of water pumped overboard. This information is printed onto a paper tape to become a permanent part of the captain's log. In situations where a number of vessels are located in an area where an oil sheen is detected on the water, the record allows the operator to demonstrate conclusively that his vessel is not the offender. Since the FWPCA provides for a fine of up to $5,000 for each offense, the permanent recording can prove to be of critical importance. The statute also requires that the owner or operator having knowledge of a discharge from his vessel, report that discharge to the Coast Guard immediately. Failure to do so is a criminal offense and could produce a fine of up to $10,000 or a year's imprisonment or both! Observers of the marine transportation scene have noted the Keene system's monitor/recorder feature as one of its strongest recommendations.

Fail-Safe Feature—The new system is based on time-tested Keene filtration, separation filters and coalescing units engineered into an automatic system. Elements are changed as required, and two sets of spares are furnished with each new system. If for any reason the oil level of bilge discharge begins to exceed the preset limit of eight parts oil to one million parts of water, the system automatically cuts off overboard bilge discharge and goes into a recirculating mode. It also activates a red signal light on the equipment itself and on the bridge. A plainly audible warning signal is also triggered, and overboard bilge discharge cannot be resumed until the system is once again ready to process water within acceptable limits. Usually, a simple change of filter or separating element is all that is needed to completely renew the system. No disassembly, steam-cleaning, sludge scraping or blow-down is required.

Modular To Fit Tight Spaces—One problem solved in developing the new Keene Marine Discharge Control System was that it must fit many types of existing as well as new hulls. Available open space is hard to find in most vessels, so initial units were test-installed on this type of vessel to insure the system would easily fit aboard even in tightly cramped space. The solution, according to the designers, was found by constructing the system in modules or building blocks. This way, the individual components can be installed either one place or a combination of smaller spaces. The largest module in the Keene system fits through any existing hatch or opening as small as 24 inches by 36 inches. The modules are then easily interconnected, and the units operate as an automatic system.

Works In Fresh Or Salt Water — Company spokesmen point out that although the system is currently being installed on towboats and tugboats, it has the capacity to handle bilgewater control on any size vessel. "We knew the system would take care of virtually any vessel's bilge problem," they stated. "But the most pressing need we felt was among workboat operators on inland waterways and coastal waters. That's why our research and testing concentrated on tow and tugboats. After all, July 1 is the effective date of the oil pollution prevention regulations, and workboat operators stood to be hurt soonest and hardest. Our Keene Marine Discharge Control System also had to be functional on vessels operated in both fresh and salt water, and workboats fit this situation."

Visual Identification Needs — Since responsibility for enforcement and reporting violations rests with both the vessel operator and the Coast Guard, Keene is supplying a large reflective decal in the shape of a pennant, with the words "Keene Marine Discharge Control System Protected." Coast Guard enforcement teams can easily see this emblem at a distance and, in the case of an oil sheen on the water, quickly and easily identify and may eliminate as suspects any vessels with the Keene system aboard.

Production Speeded Up — Although until now the system has received no advance publicity, word of its imminent introduction has spread rapidly in marine circles. The result has been a flood of both inquiries and orders. "We are handling these on a first-come, first-served basis," reported a Keene spokesman. "We have doubled our original production estimates only to have to redouble them. Although the engineering system is new, it utilizes many components we have been long supplying to the marine industry. After all, we have been closely involved in marine and other filtration applications for over 75 years. All replacement elements are to be stocked, as are the systems themselves, by a nationwide network of marine distributors. We are working as hard and as fast as possible to fulfill demands before the regulation deadline of July 1."

New ACBL Towboat Built By Jeffboat Honors D. Ray Miller

American Commercial Barge Line Company (ACBL), on March 30, placed in service the eighth of a new series of 5,600-horsepower towboats being built for the company by Jeffboat, Inc. ACBL and Jeffboat, both located in Jeffersonville, Ind., are units of the Inland Waterways Services Division of Texas Gas Transmission Corporation.

The new vessel, which was launched on February 23, was named in honor of **D. Ray Miller,** vice president, distribution services, for ACBL. Mr. **Miller** has been with the organization that evolved into the Inland Waterways Services Division of Texas Gas since 1949, following his graduation from the University of Pittsburgh with a major in transportation. ACBL operates more than 40 towboats and over 1,100 barges on over 8,000 miles of the American inland waterways system.

The Motor Vessel D. Ray Miller, like the seven other craft in the new shorter-design series of towboats that are already in ACBL service, is described as an engineering hybrid of a highly successful 13-boat 5,000-horsepower series built in recent years by Jeffboat.

The vessels in the new series are driven by two 2,800-horsepower engines. Each is 145 feet long, 48 feet wide, and has 11 feet 6 inches of hull depth. The length is a reduction from the 170 feet of the earlier 5,000 - horsepower Jeffboat - built towboats, and the width is increased from 40 feet to 48 feet.

Texaco Appoints Henry M. Matthews

Texaco Inc. has announced the appointment of **Henry M. Matthews** as assistant to the senior vice president for Worldwide Sales and Marine. He will continue to be located in New York.

Mr. **Matthews** was graduated from Tufts University in Medford, Mass., in 1947 with a Bachelor of Science degree in mechanical engineering, and joined Texaco as a sales trainee in New York that same year. After serving in various sales positions in the United States, Mr. **Matthews** was named manager of distribution development for Texaco Services (Europe) Ltd., at Brussels, in 1968. He returned to Texaco Inc. in New York as coordinator-Europe, in the International Sales-Europe department, in 1971, and later that year was named sales manager-Northern Europe. Mr. **Matthews** was appointed regional manager for the United Kingdom and Ireland in 1972.

Keene Names Comet East Coast Distributor For New Pollution Control

A new system to remove oil and other contamination from bilgewater is to be sold by Comet Marine Supply Corp., 157 Perry Street, New York, N.Y. The system is called the Keene Marine Discharge Control System™. Once installed, it process bilgewater and prevents oil contamination from entering waterways, harbors or the open sea.

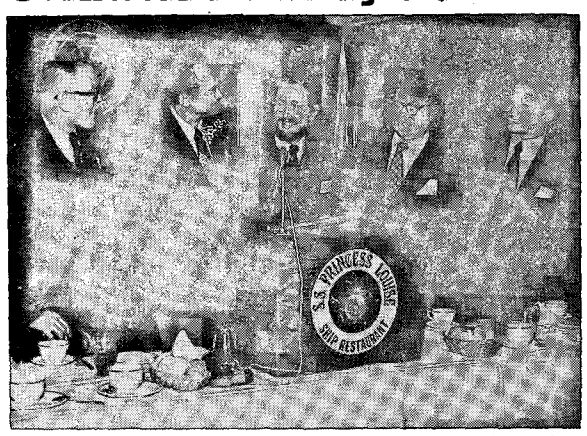
Beginning July 1, 1974, the Coast Guard is to enforce stringent new Federal regulations which prohibit discharge of fluids in navigable waters of the United States, "if such discharge causes a film or sheen on the surface of the water." Vessels using the new system will not only be able to avoid violations, but thanks to a special recorder and monitor system, they can demonstrate compliance. The system maintains a permanent record in the form of a printed tape. The tape shows exactly when the system was operated and keeps a chart showing the quality of water discharged overboard. This tape becomes a permanent part of the captain's log.

As the distributor for the new systems, Comet Marine will, beginning immediately, carry a stock of the systems for immediate installation, as well as a complete stock of parts and replacement elements for the filters and oil separation portions of the system. **John Perez,** president of Comet Marine Supply Corp., will be in charge of all sales for the new Keene system.

"One of the big advantages of this system is that it is easily installed aboard just about any vessel," Mr. **Perez** said. "It is built in modules or building blocks. The largest of these fits through a 24-inch by 36-inch hatch or opening, and the system can be installed as a single unit or placed into individual components, depending on available space. It starts and stops itself automatically. So extra hands are not needed. Keene has been a supplier of Keene/Bowser equipment to the marine industry for over 75 years. Their new Marine Discharge Control System is a significant contribution to pollution control, not only to vessel operators but also to the public as well. We are very happy to be doing our part to help eliminate oil sheens through the installation of these systems. We have found that the vessel operator is just as concerned about preventing pollution to the water environment as the public, and the Keene system makes the elimination of oily wastes possible."

Comet Marine Supply Corp. is located at 157 Perry Street, New York, N.Y. 10014.

SNAME Los Angeles Section Hears Paper On Optimization Of Artesanal Fishing Craft



Shown above during the March 14 meeting of the Los Angeles Metropolitan Section of SNAME, left to right: **Peter Bowman,** Section papers chairman; **Harry Levy,** secretary-treasurer; **T.J. Noland,** author; **Frank Nickels,** chairman of the Section, and **Charles K. Pollock,** vice chairman.

The fifth meeting of the season for the Los Angeles Metropolitan Section of The Society of Naval Architects and Marine Engineers was held on March 14, 1974, at the Princess Louise Restaurant in the Port of Los Angeles, Calif. The meeting was preceded by a dinner and social hour.

A very informative paper on an unusual subject, entitled "Optimization of Artesanal Fishing Craft," was presented by **T.J. Nolan,** naval architect. The author described a computer-aided scheme which optimizes speed, hold capacity, length, beam, and block coefficient of a small fishing boat based on the requirements of Cooperativa Las Palmas in Esmeraldas, Ecuador. The design process considers three alternative types of low-cost construction, a comprehensive list of locally available motors, weight, and stability. Capital recovery factor is the measure of merit determining the optimum vessel.

Braganca Appointed Director Dravo Subsidiary In Belgium

Philippe T. Braganca has been appointed director of Dravo Europe, S.A., N.V., a Dravo Corporation subsidiary headquartered in Brussels, Belgium.

Mr. **Braganca,** who joined Dravo in 1969, was born in Austria and educated in Italy and Brazil. He is a graduate of the Brazilian Naval Academy in Rio de Janeiro.

Headquartered in Pittsburgh, Pa., Dravo is involved in heavy construction, towboat and barge building, process plants, mine development, ore beneficiation, ferrous and nonferrous metallurgy, heavy bulk materials handling, water and waste treatment and offshore structures.

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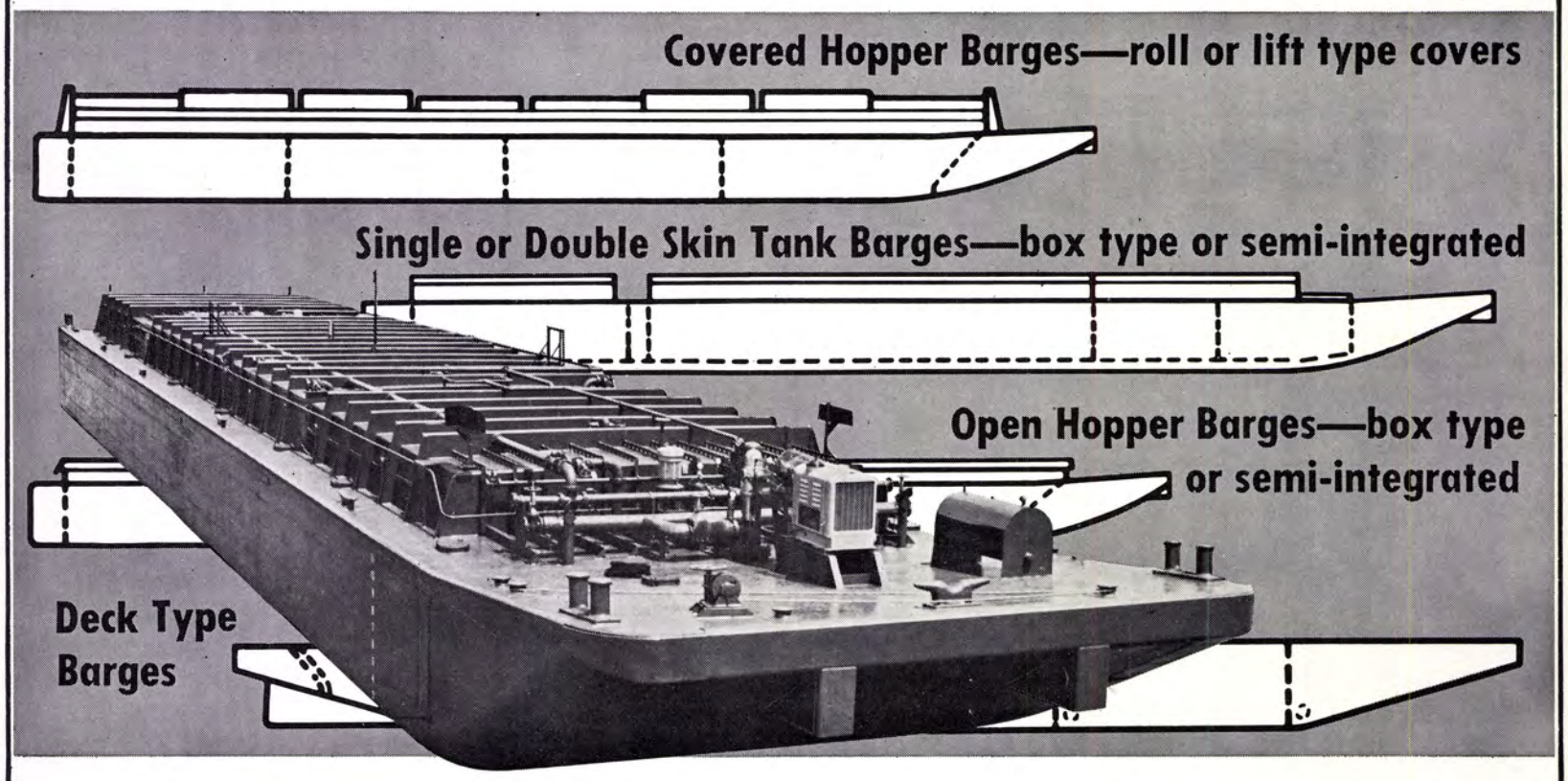

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Channelizing Simplified With New System Introduced By CAI

In recent years, the demands placed on marine SSB communications systems have increased to the point where major modifications must be made to commercially available equipment if it is to fully meet the user's requirements. Today's commercial vessels require a large number of widely dispersed operating frequencies to fully utilize the U.S. marine bands between 2 and 22 MHz. Reliable long distance communications on these frequencies requires that the operator be able to select from a wide range of frequencies an optimum frequency for the particular circumstances (i.e., station locations, time-of-day, propagation conditions, etc.). In addition, many vessels now require frequencies outside the standard U.S. marine bands. Operation in foreign waters, such as the North Sea, requires frequencies far removed from those most commercial equipment was designed to accommodate. Vessels leased to the military face similar problems in accommodating frequencies outside the standard U.S. marine bands.

Communication Associates, Inc. has introduced a system which promises to greatly simplify the task of outfitting commercial vessels with an effective SSB system that will avoid obsolescence. The CA-35MS/MK II Transceiver is the heart of the new system. As in earlier CAI marine transceivers, a frequency synthesizer is used to eliminate the need for channel crystals. This approach has proved its versatility on hundreds of vessels. Channel frequency changes can be made by the radio operator even at sea. The significant advantage of this latest system is broad bandwidth, approximately 10 times that of conventional transceivers. This feature permits the CA-35MS/MK II to accommodate any 40 channels throughout the 2, 4, 6, 8, 12, 16, and 22 MHz marine bands without modifications. In addition, nonstandard frequencies can be accommodated at the time of installation, or at some later date, should the vessel's requirements change.

CAI has also developed a servo tuned linear amplifier and servo tuned antenna couplers which complement the transceiver's wide frequency coverage. An added advantage of servo tuning in the antenna coupler is that the system will automatically compensate for changes in antenna characteristics due to weather conditions, nearby vessels or moving equipment on board. When the antenna system is installed shoreside, it will readjust itself for optimum efficiency when on open water.

In short, the CA-35MS/MK II is designed to simplify the task of providing oceangoing vessels with an effective SSB communications system. Installation is simplified, since the radio is completely set up at the factory and needs only to be bolted in and cabled. From the vessel operator's point of view, he will have a radio that meets all his present requirements and will not become obsolete or require extensive modifications should his requirements change.

Details on the "MK II" system can be obtained from Communication Associates, Inc., 200 McKay Road, Huntington Station, N.Y. 11746.

McDermott To Build 4 Oceangoing Tugs For Henjen Corp.

The Maritime Administration has approved a Title XI application from Henjen Corp. of San Francisco, Calif. to assist in the construction of four oceangoing tugboats costing approximately $7.8 million. J. Ray McDermott Co., Inc. of Morgan City, La. will build the 4,860-horsepower vessels, with delivery scheduled for 1975.

K Line-Kerr Corp. Appoints Matsunari

K Line-Kerr Corporation has announced that **H. Matsunari** has assumed his post as executive vice president in San Francisco, Calif. Mr. **Matsunari,** well-known in worldwide shipping circles as a prime developer of containerized shipping, will also serve in the capacity of owners representative for K Line.

NASSCO Promotes Peter C. Finne

Peter C. Finne

The assignment of **Peter C. Finne** to the position of chief manufacturing engineer, National Steel and Shipbuilding Company (NASSCO), San Diego, Calif., has been announced by **John V. Banks,** president and chief executive officer. Mr. **Finne** will fill the position vacated by the late **H.J. Anthony.**

Mr. **Finne** received his B.A. degree in mathematics in 1965 from the University of Kansas, Lawrence, Kan., and his M.S. degree in computer science in 1971 at the Naval Postgraduate School, Monterey, Calif.

Prior to joining NASSCO in 1973 as senior systems analyst, Mr. **Finne** served 13 years in the U.S. Navy. His last assignment was that of new construction project officer, Supervisor of Shipbuilding, Conversion and Repair, 11th Naval District, San Diego, Calif.

Theriot To Operate Big Offshore Vessels With U.K. Partners

North Sea Assets Limited of Edinburgh, Scotland, and New Court Natural Resources Limited of London, England, announce that they have jointly acquired a 51 percent interest in a new British company which will own a fleet of 12 offshore supply vessels. NSA's and NCNR's partners in this venture, holding the balance of the equity, are U.K. subsidiary and associated companies of Nolty J. Theriot of New Orleans, La. The joint venture will be named Theriot Offshore International Ltd.

Theriot, which is already well established in the North Sea as an operator of specialized anchor-handling tugs and has a total of five bases in the U.K. and Norway, will manage the vessels for the new company.

The acquisition of the vessels and the provision of working capital involves a total of approximately $45 million. Of this, NSA and NCNR are each contributing $5 million in cash by way of debt and equity. The main debt financing is being provided by First National Bank of Chicago.

The vessels have an overall length of 228 feet 6 inches, and engines capable of developing 8,000 horsepower. They belong to a new class of very powerful large-capacity supply boats. They have been specifically designed to service the demanding requirements of the latest generation of semisubmersible drilling rigs, which in turn are capable of operating in greater depths of water and under more hostile conditions than hitherto.

The vessels, which were originally ordered in early 1973, are under construction at Todd Shipyards in Seattle, Wash. The first six vessels are due for delivery beginning this month. All 12 vessels will be operational by 1975.

The vessels will sail under the British flag. Operations will initially be concentrated in the North Sea; however, NSA, NCNR and Theriot consider there may also be potential in other parts of the world, both for vessels now being acquired and for other supply vessel projects.

NSA is an investment company jointly managed by Edward Bates & Sons Limited, and Noble Grossart Limited. NCNR is an investment company sponsored by N.M. Rothschild & Sons Limited.

Baker-Whiteley Towing Elects T.J. Murphy To Board Of Directors

Thomas J. Murphy Jr., vice president of The Baker-Whiteley Towing Co., Baltimore, Md., has been elected to the board of directors of the company. Mr. **Murphy,** who has been with the towing firm for the past three years, was formerly vice president of operations of Ramsay Scarlett & Co., Inc.

Bossidy To Head Leasing Program For General Electric Credit

General Electric Credit Corporation has named **Lawrence A. Bossidy** to head its $1.5-billion leasing program—largest in the United States, it was announced by **C.G. Klock,** president and general manager.

Mr. **Bossidy** has been with GECC and its parent organization, General Electric Company, for 17 years and until his recent appointment, headed GECC's growing accounts receivable financing business, which supplies working capital to manufacturers and distributors. He is a vice president of the company.

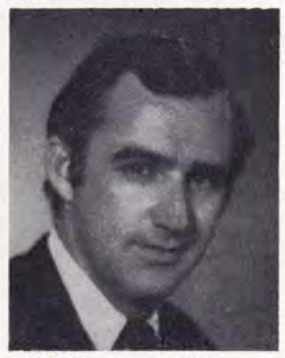
GECC's latest major achievement in leasing was the purchase of the supertanker Brooklyn, largest ship ever built in the United States, now on 25-year charter to American Petrofina Inc.

The company also recently announced that its leases in the energy field alone — oil drilling, gas exploration and processing, coal mining and handling, and tankers —have exceeded $600 million in the past five years. Mr. **Klock** noted that energy-related leases by GECC are scheduled to be at an even higher annual rate in 1974.

GECC was the first lessor to combine low-cost leveraged leasing for industrial pollution - control equipment with senior funds provided by tax-exempt revenue bonds. Its leasing activity has included equipment in all forms of commercial transportation—jet airliners, railroad rolling stock, truck fleets, and a number of specialized and general cargoships in addition to tankers.

Mr. **Bossidy** is a graduate of Colgate University, joined General Electric Company in Schenectady, N.Y., in 1957, and has held positions of increasing responsibility in auditing and finance since that time. He joined GE Credit in 1970 as manager of finance for the commercial and industrial financing department, and was named manager of accounts receivable financing business in April 1973.

T. Smith & Son, Inc. Appoints C.C. Morton



Christopher C. Morton

The appointment of **Christopher C. Morton** to the executive staff of T. Smith & Son, Inc., was announced by **James E. Smith,** president of the New Orleans, La., stevedoring firm.

Mr. **Morton's** primary responsibilities will be in the areas of business development and customer and labor relations, Mr. **Smith** said.

Mr. **Morton** is a native of Ohio. He received his early education in the private school systems of Cleveland and Gates Mills, Ohio, and holds a bachelor's degree in business administration from Boston College, Boston, Mass.

Mr. **Morton** joins T. Smith & Son after a 14-year career in stevedoring and terminal operations in the Great Lakes region. He is a trustee of the Great Lakes Terminals Association and a past national chairman of the Management Cargo Handling Safety Committee.

He is presently serving as first vice president of the National Maritime Safety Association. Mr. **Morton** was recently named to represent the stevedore industry. (for terminal cargo-handling technicians) by the Occupational Safety and Health Administration.

Palle Bistrup Joins Nordkapp Chartering

Palle S. Bistrup has joined Nordkapp Chartering Inc. in the capacity of vice president, it was recently announced by the Greenwich, Conn.-based firm. Mr. **Bistrup** was previously associated with Stolt Nielsen Chartering Inc.

F.A.E. Redman Joins Waukesha Motor Co. As Far East Rep

F.A.E. Redman

F.A.E. Redman has joined Waukesha Motor Company's International Organization in the capacity of regional representative for the Far East.

The announcement was made by **P.C. Trombley,** field sales director-International, for the Waukesha, Wis.-based engine and power systems equipment manufacturer. He will be based at Waukesha's Singapore office.

Mr. **Redman** comes to Waukesha from Motor Specialties Ltd., Waukesha's international distributor in Aukland, New Zealand, so is well-acquainted with Waukesha products and service. His previous experience includes 12 years with Ruston Diesels Ltd., in England, and three years with the Canadian subsidiary, Lister-Blackstone.

Mr. **Redman** is an apprenticeship graduate of Blackstone & Co.

Offshore Conference Subjects Include Manpower Needs

Manpower identification, training, recruitment, and career development for the offshore industry will be topics of discussion during a technical session on "Education For Offshore Technologists" at the Sixth Annual Offshore Technology Conference, May 6-8, 1974, at the Astrohall in Houston, Texas.

The paper—to be presented by **Robert B. Abel** and **Leonard Mitchell,** with the U.S. Department of Commerce—is a sequel to the special session conducted at the 1973 Conference entitled "Education and Manpower Needs for the Offshore Industry." Mr. **Abel** is director of the National Sea Grant Program in Rockville, Md., and Mr. **Mitchell** is with the National Oceanic and Atmospheric Administration in Rockville.

The "Education and Manpower Needs" discussion will be highlighted by a presentation describing recent research on offshore technology training and employment, case studies conducted at community colleges specializing in or related to offshore technology, and preliminary statistics gathered from an OCT and Sea Grant questionnaire.

The session will also include a paper outlining the results of Shell Oil Co.'s new basic training program for producing operations personnel. The presentation, to be made by **E.L. Pace** and **C.R. Turner,** with Shell's Offshore Division in New Orleans, La., will describe the program's results in the specific areas of knowledge gain, attrition rates, and trainee morale. The program's expenditures will also be discussed.

Other papers scheduled for presentation during the session include: "Education for the Offshore Industry in Europe," by **J.W. Pendered** and **R. Eatock Taylor**, with U. College in London, England; "A Unique Degree Program for the Shipbuilding Industry," by **J.E. Thomas, C.F. Anderson, F.G. Bartlett,** and **G.D. Bryant,** with Mississippi State U.; "Marine Manning, Licensing, and Training for Offshore Mobile Drilling Units," by **Paul A. Johansen** and **Dillard S. Hammett,** with SEDCO, Inc. in Dallas, Texas, and "Ocean Engineering Educational Programs," by **John B. Herbich,** with Texas A&M U. in College Station, Texas.

The Offshore Technology Conference is an international technical meeting and exhibition devoted to the development of the world's offshore resources. The conference, which is jointly sponsored by 11 engineering and scientific societies, is expected to attract more than 25,000 persons.

DELAVAL TURBINES

DELAVAL STEAM TURBINES AND GEARS POWER WORLD'S LARGEST LASH/ CONTAINER VESSEL.

A 32,000 horsepower main propulsion unit from DELAVAL powers the S.S. DELTA MAR — the largest LASH/container vessel ever built in the United States. Delivered by Avondale Shipyards to Delta Steamship Lines, the 893 foot long DELTA MAR joins a long line of distinctive vessels driven by DELAVAL main propulsion turbine and gear systems.

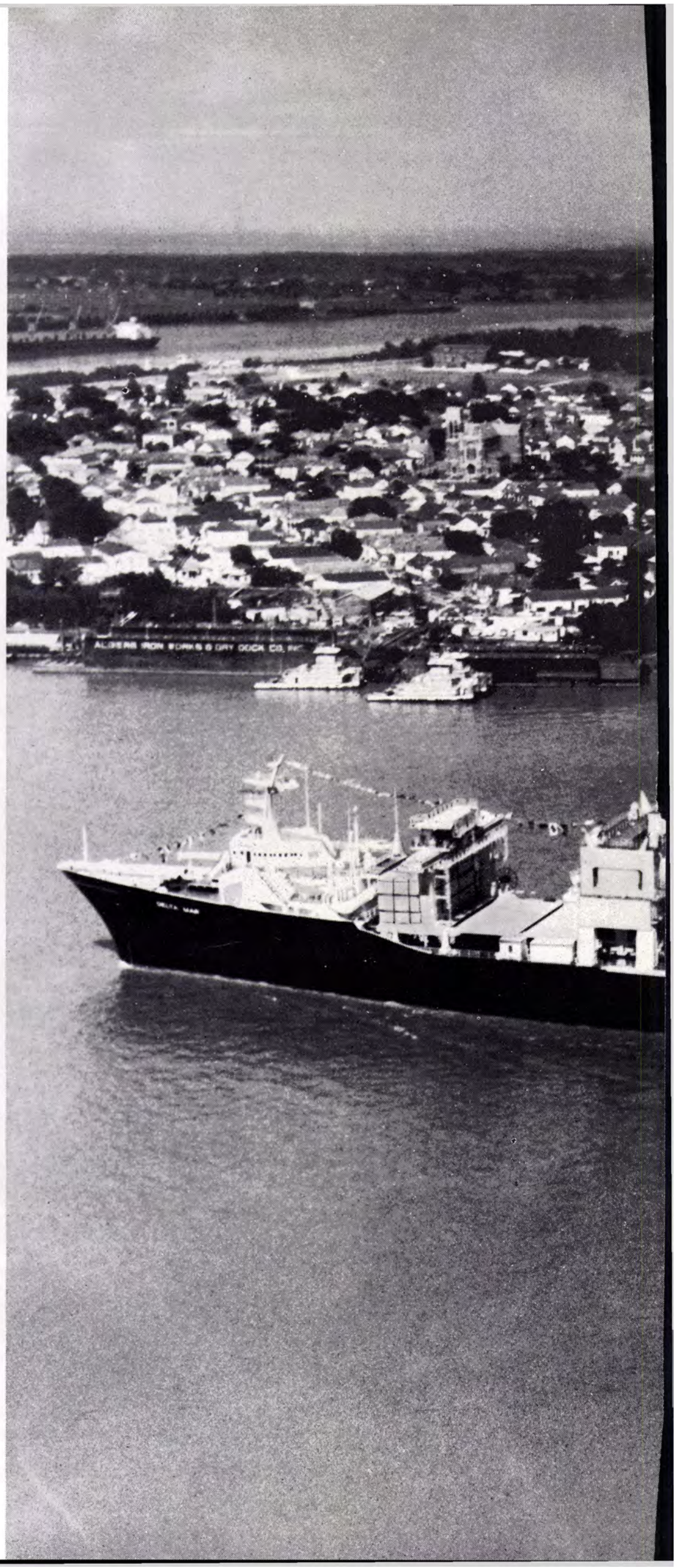
DELAVAL's main propulsion units are products of over seven decades of research, development and commitment to the marine industry.

Electric power is generated in DELTA MAR by DELAVAL's new line of 2000 kw ship service turbine generators.

But that's not all—DELAVAL designs and builds condensers for surface vessels and submarines; quiet IMO® rotary pumps for fuel oil service, fuel oil transfer, lube oil service and hydraulic systems — (above or below deck); and the renowned DELAVAL Enterprise diesel engine delivering up to 12,500 bhp to ships of all types.

For information on how you can take advantage of DELAVAL's experience in the marine industry contact: DELAVAL Turbine Inc., Turbine Division, Trenton, N. J. 08602. (609) 587-5000.

DELAVAL



SNAME Chesapeake Section Hears Paper On Commercial / Government Program Management System

Pictured at the Chesapeake Section meeting, left to right: **Eugene Miller,** Hydronautics, Inc.; **J.B. Bingham,** General Electric Co.; **Saul M. Kaplan,** author, General Electric Co.; **Seth Hawkins,** chairman, Chesapeake Section; **James Higgins,** moderator, MarAd; **Phillip Eisenberg,** president, SNAME and Hydronautics, Inc., and **Ronald Kiss,** section Secretary-treasurer, MarAd.

The Chesapeake Section of The Society of Naval Architects and Marine Engineers held the sixth meeting of its technical program on March 5, 1974, at the Walter Reed Hospital Officers' Club in Washington, D.C.

Following the social hour and dinner, which were enjoyed by approximately 60 members and guests, chairman **Seth Hawkins** opened the meeting by welcoming those in attendance and especially noting the president of SNAME, **Phillip Eisenberg.** Mr. **Eisenberg** really needs no introduction to the membership of the Chesapeake Section because he has been a most active member and past officer in the Section for many years. Mr. **Hawkins** then introduced the moderator for the technical session, **James Higgins,** Deputy Assistant Administrator for Commercial Development, Maritime Administration. Mr. **Higgins** has had a long and distinguished Government career and has been active in the MarAd Research and Development Program for approximately 20 years. He introduced the author of the paper, **Saul Kaplan,** as Manager, MarAd Project and Heavy Fuels Program, Gas Turbine Products Division of the General Electric Co. The title of his paper is "A Commercial/Government Program Management System—One That Works."

Mr. **Kaplan** commenced his presentation by giving a general overview of the MarAd/General Electric Gas Turbine R&D Project, in which the management system was being utilized. This unique program management system was developed for application in a commercial product development-oriented environment. The management system represents one very tangible attainment of the project, for which it was expressly developed and has been successfully applied—a program whose costs were shared equally between a Government agency and a commercial market-oriented corporation. The management concept has been evolved around (1) a substantial revision of a previous INPUT/OUTPUT management control system and features a new technique for measuring effectiveness; and (2) the concurrent development of the Project Overall Status Summary that provides executive evaluations of project performance relative to goals. The "overall effectivity" formation developed provides a means for evaluating trends in the R&D project performance. The Project Overall Status Summary has proved itself to be an effective means for assessing the status of the project performance goals and describing technical accomplishments. This system has provided an effective means for improved R&D project management.

At the conclusion of the paper, a lively discussion ensued regarding performance measurements, penalties for under-expenditures and the difficulties of avoiding a "numbers game." However, as a result of this paper and discussion, the membership was made aware that an effective project management system was available and working to measure the performance of an extensive R&D program.

Global Shipservices Forms New Company

Electrolux Gotaverken Global Shipservices, EGGS and Nico International have concluded an agreement concerned with cooperation which implies the establishment of a joint limited company known as EGGS-Nico International Shipservices AB.

The new company is primarily to concentrate on the marketing of the goods and services offered to international shipping by EGGS and Nico, product development within the service range and also the coordination of standards, conditions and similar factors for the activities carried out by the two individual parties, EGGS and Nico International.

The new company is to have its activities located in Goteborg, and it is expected to be fully developed by the beginning of 1975.

AB Electrolux and AB Gotaverken have together formed Electrolux Gotaverken Global Shipservices, EGGS, in order to create an organization which provides international shipping with cleaning and repair services. When it is fully developed, EGGS will consist of about 10 foreign subsidiary companies.

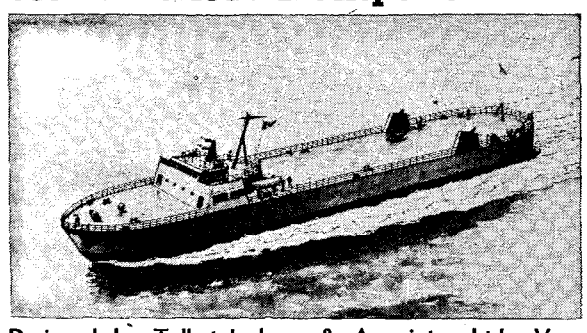
Nicoverken AB, a Goteborg company, has built up an international group of companies known as Nico International, which provide repair and service facilities to international shipping with great success. Nico International carries on its activities in Las Palmas, Lisbon, Rotterdam and Goteborg, and there are also sales offices in London, New York and Rio de Janeiro.

F.M. Clifford Agencies Opens New Offices

The opening of the new offices of F.M. Clifford Agencies, Inc., in the Bourse Building, Independence Square, Philadelphia, Pa., has been announced by **Frank Clifford.**

The company will handle all phases of representation for shipowners, operators, charterers and agents.

Burrard Dry Dock Receives $6-Million Contract To Build 385-Ft. Railcar Transporter



Designed by Talbot-Jackson & Associates Ltd., Vancouver, the new vessel will be powered by two General Motors EMD-645E 16-cylinder diesels, each rated 2,875 bhp at 900 rpm.

Burrard Dry Dock Company Ltd., Vancouver, British Columbia, has been awarded a contract valued at $6.3 million to construct an ice-strengthened railcar transporter capable of carrying 26 fifty-foot railway cars. The 385-foot vessel will be jointly owned by Incan Ships Limited, and Quebec and Ontario Paper Company Ltd., and will operate year-round between terminals to be constructed at Quebec City and Baie Comeau.

The new transporter, when placed in operation in the summer of 1975, will be used by CP Rail to extend its network to the north shore of the lower St. Lawrence River.

Loaded capacity of the 6,060-ton railcar carrier is 1,820 tons of newsprint. The transporter is expected to average more than three trips per week.

Seatrain Lines Elects Russell And Goodchild

Stephen Russell

Anthony A. Goodchild

Seatrain Lines, Inc. has elected **Stephen Russell** as a director, executive vice president and chief operating officer, and **Anthony A. Goodchild** as a director of the company, it was recently announced by **Howard M. Pack,** president.

Mr. **Russell** has been executive vice president of the Hertz Corporation, responsible for its truck and equipment renting and leasing operation. Previously, he had been vice president of financial analysis for RCA Corporation and a group director and senior manager with the Ford Motor Co. where, among various product planning and financial responsibilities, he directed the development of the Pinto automobile. A trustee of City Investing Realty Trust and a member of the board of the Private Carrier Conference and CATRALIA, the vehicle renting industry organization, Mr. **Russell** received his graduate degree in finance and marketing and his undergraduate degree in mathematics and physics, both at Cornell University.

Mr. **Goodchild** is currently a group vice president of IU International Corporation with responsibility for directing the activities of its Energy Systems Group, comprising most of IU's manufacturing companies in the United States and overseas. Mr. **Goodchild** was born and educated in England and came to the United States in 1956.

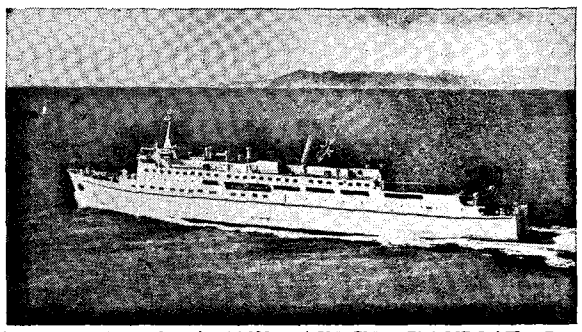
"I WANTED QUALITY.

I SPECIFIED HYDRODYNE"

When E. Thomas Drennan, President of Sioux City and New Orleans Barge Lines, decided to order a new towboat to supplement a large number of barges St. Louis Ship is building for them, he gave the matter a great deal of thought. He gathered all available data and talked to other knowledgeable rivermen. And Tom Drennan *listened.* Sioux City never bought a towboat from St. Louis Ship before. But all the facts led to HYDRODYNE. When we asked Mr. Drennan why he selected St. Louis Ship . . . he replied simply: "I wanted quality. I specified Hydrodyne." The 7000 HP, twin screw M/V Robert Crown was the result. After a new series of tests performed at the Netherlands Model Basin, the exclusive Hydrodyne design has now been more highly refined, to produce even greater maneuverability, without sacrificing any of the famous Hydrodyne PUSH. Remember, higher efficiency makes more push with less fuel. When you want PUSH *and* Quality, call us at (314) 638-4000.

ST. LOUIS SHIP
DIVISION OF POTT INDUSTRIES INC.
611 EAST MARCEAU STREET, ST. LOUIS, MO. 63111

New York, Chicago, Kansas City, New Orleans, Memphis, Minneapolis, Houston and Mobile.



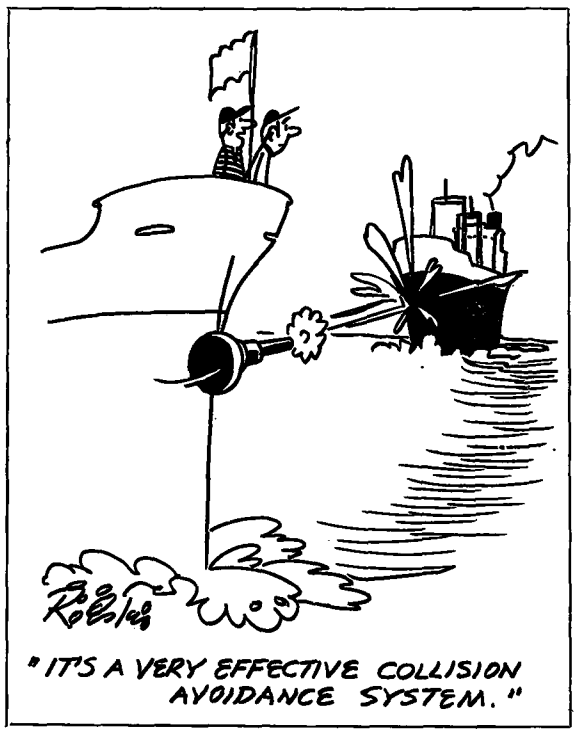
NKK DELIVERS JAPAN'S FASTEST FERRYBOAT: Delivery of the Takachiho Maru, a 10,000-gross-ton passenger-vehicle ferry with a service speed of 25.6 knots has been announced by the Shimizu Yard of Nippon Kokan (NKK). NKK's New York shipbuilding department said the vessel—Japan's fastest ferry—will cut six hours from the 25-hour voyage between Kawasaki City and Hosojima Port on Kyushu Island. Built for Nippon Car Ferry Company, the ship has accommodations for 1,016 passengers, 150 passenger cars, 62 eight-ton trucks, or other vehicle combinations. Major features include variable pitch remote control propellers, bow thrusters for maneuvering in port, and gyrostabilizer fins to reduce rolling. The fin stabilizer system automatically adjusts angles of fins, attached to each side of the hull amidships, to create a force opposite to that of waves, as calculated by a computer system.

Hansen Announces Additions To Cargo Tie Down Equipment

A.L. Hansen Mfg. Co. of Gurnee, Ill., entered the marine hardware field with a line of cargo tie down equipment under the Kargofast banner. That successful introduction, two years ago, has prompted the addition of several related items. The product group originally consisted of a unique heavy steel track, mounted to deck or bulkhead. This Kargotrak accommodates versatile sliding, self-locking travelers which allow for strap or shackle type tie down.

Included are Kargolok (with universal ball joint swivel) for flush mounting to deck or bulkhead . . . and recessed, rotating cargo tie down rings for flush deck mounting. A rugged, compact strap tensioner (using any standard wrench to tighten load bindings) is also available. Hansen equipment is presently being designed for container as well as shipboard application.

A.L. Hansen has manufactured quality heavy duty hardware for over 50 years. They have been a major supplier for builders of all types of over-the-road transportation vehicles and off-road industrial equipment. This same tradition of quality, including outstanding engineering and R&D facilities, is now available through the Hansen Marine Division.



Ingram Corporation Buys Breit Engineering Interests In Tug Barge Systems Inc.

Ingram Corporation, New Orleans, La., has acquired the interests of Breit Engineering, Inc., in Tug Barge Systems Inc. (TBSI), New Orleans, which was previously equally owned by Ingram and Breit. Tug Barge Systems Inc. is now a wholly owned subsidiary of Ingram Corporation, according to **Frederic B. Ingram,** board chairman and director.

Tug Barge Systems Inc. is the owner and the exclusive licensor of United States and foreign patents covering the tug-barge system already in successful use by Ingram Corporation's subsidiary, Ingram Ocean Systems, and by a number of licensees, including ship operators in the United States and foreign countries. Among the present licensees are Bulk Food Carriers of San Francisco, Calif.; Lusteveco, a Philippines company; Union Navale of France; and Mitsui, a large Japanese company. Other licenses have been granted in Great Britain and Italy.

The system developed by Breit Engineering at Ingram expense involves an oceangoing tugboat and a separate unmanned barge which can be joined together by a rigid connection so that there is no relative motion between the vessels, and the combination system operates as one vessel in all seas and weather situations. At the same time, the two vessels can be rapidly and easily disconnected by one man operating a control console on the towboat bridge. If desired, one towboat may be used in combination with several barges.

The barges can be built to handle coal, ores, solid agricultural products or liquid crude petroleum, oil products or chemicals.

Tug Barge Systems licenses the use of the know-how and patents on the basis of fixed fees determined by construction costs, and also arranges with naval architects for necessary design engineering for licensees.

Mr. **Ingram,** chairman of Ingram Corporation, serves as chairman of Tug Barge Systems Inc., and **Edmund L. Hukill,** a vice president of Ingram, serves as president of the licensing company.

Ingram Corporation, a large privately owned company, presently has 14 subsidiaries. With four exceptions, these subsidiaries are concerned with petroleum and the transportation of petroleum products, petrochemicals, and allied products such as sand and rock, as well as pipeline construction.

Puget Sound Pilots Award Contract to The Boat Yard, Inc.

Capt. **Emery Joyce,** president of the Puget Sound Pilots Association, recently announced the signing of a contract with The Boat Yard, Inc. of Seattle, Wash., to construct a 50-foot twin-screw diesel-propelled pilot boat for service out of their Port Angeles pilot station. The boat was designed by Nickum & Spaulding Associates, Inc. of Seattle, using a standard fiberglass charter boat hull designed by Lynn Senour and manufactured by Delbo, Inc. of Seattle.

The design of this boat has been developed as the result of 10 years of research and continuous consultation with the Pilots in order to assure them that their new vessel will ideally suit their specific needs.

The new pilot boat will have a length overall of 50 feet, a breadth of 15 feet 10 inches, a draft of 3 feet 6 inches, and displacement of 40,000 pounds.

Twin Cummins V8-903 diesel engines will drive the new boat at a maximum speed of 20 knots. Special protective skegs have been designed to give protection to the two four-blade Nibral 26-inch Michigan propellers in the debris laden waters of the Straits. Twin rudders controlled by a two-station Wagner hydraulic steering system will guarantee a high degree of maneuverability while either going ahead or astern.

The new boat will be placed in service on October 15.

GM Electro-Motive Division Promotes Dowell And Brash

Stephen B. Dowell

Frederick L. Brash

Promotion of **Stephen B. Dowell,** district manager-marine sales, to manager of marine sales for the Electro-Motive Division of General Motors has been announced by **Milton H. Gardner,** general sales manager.

Mr. **Dowell** succeeds **R. Stuart Ramsay,** a 40-year veteran of the marine sales and service field, who has retired.

At the same time, Mr. **Gardner** announced the promotion of **Frederick L. Brash,** Government contract coordinator, to district manager-marine sales, succeeding Mr. **Dowell.**

Both appointments are effective immediately.

Mr. **Dowell** is a native of Bremerton, Wash., and a 1948 mechanical engineering graduate of Purdue University. Following World War II service in the U.S. Marine Corps, he began his GM career in 1948 with the former Cleveland Diesel Engine Division, which was merged with Electro-Motive in 1961. At Cleveland Diesel, he held several engineering and service positions, finally moving up to marine- industrial sales representative.

He joined EMD in 1962 as district manager-marine sales at the Western Region, San Francisco, Calif., and three years later became district manager-marine sales, with headquarters at La Grange, Ill.

Mr. **Dowell** is a member of The Society of Naval Architects and Marine Engineers.

Mr. **Brash,** who was born in England, attended the University of Akron, and Fenn College of Cleveland, Ohio.

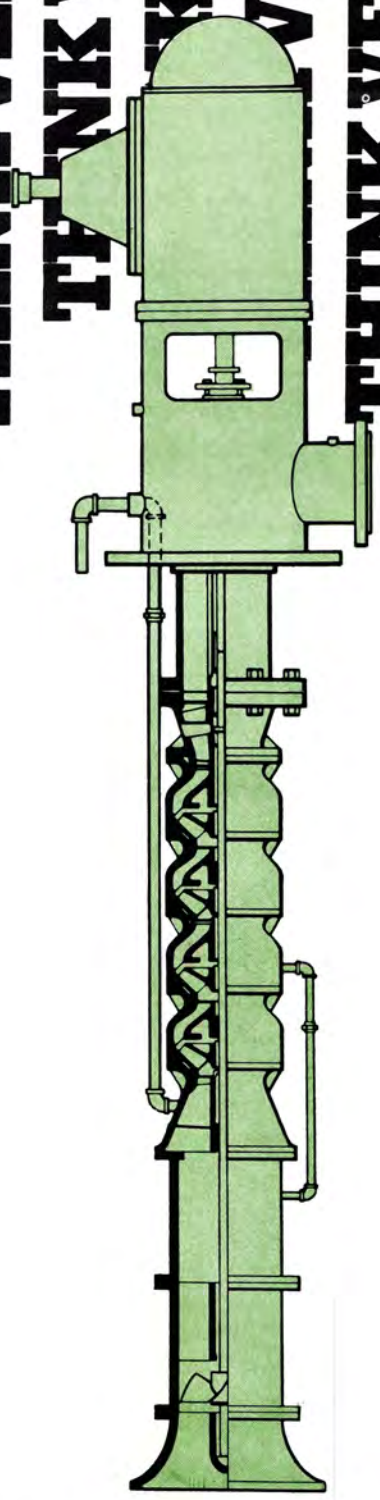
He joined GM at the Cleveland Diesel Engine Division in 1940, advancing to the position of sales engineer. From 1943-46, he served as a technical sergeant in the U.S. Army Corps of Engineers.

In 1962, Mr. **Brash** became an Electro-Motive sales engineer assigned to commercial and Government accounts, holding this post until 1967. He was later promoted to Government contract coordinator, his last previous position.

Mr. **Ramsay,** a native of Haxtun, Colo., entered co-op training in 1929 with Winton Engine Company, which became a GM subsidiary in 1930. As a co-op student, he attended Fenn College, Cleveland, and was graduated in 1934, with a bachelor of science degree in mechanical engineering.

He then went to work full time with Winton, which became Cleveland Diesel Engine Division in 1937. He was named service department supervisor in 1942, and manager of marine sales in 1946. When Cleveland Diesel was consolidated with EMD, Mr. **Ramsay** became manager of Electro-Motive marine sales, a post he held until his retirement.

THINK VERTICAL



Are you aware of all the vertical turbine advantages?

- Multi-staging allows the engineering of a pump unit that delivers the required flow and pressure at optimum efficiency.
- Minimize variations in flow due to head pressure fluctuation. Steep head capacity characteristics (as compared to conventional centrifugals) permit a greater margin of safety in the selection of design head or discharge pressure conditions
- Safe motor loads. Johnston vertical turbine pumps have a nonoverloading power characteristic that allows operation at any capacity without overloading the driver.
- Safely meet system NPSH requirements, even at zero feet.
- Always primed.
- Johnston vertical turbines require a minimum of valuable surface area for installation.
- Available in a wide range of construction materials and sizes.

The drawing above shows a Johnston vertical "Stripper" for shallow draft barge applications. Johnston vertical pumps are built for safe, rapid unloading and stripping of cargo barges and other carriers

Here's where verticals pay off in performance . . .

Volatiles—Verticals meet the critical NPSH requirements in handling volatile cargoes.

Caustics—In-hold pump eliminates need for costly suction pipe installation.

Product and fuel transfer—Most efficient hydraulics and most economical use of space and power.

Engine room applications—Use Johnston verticals to simplify pump installation.

On each pump application, look at the advantages vertical turbines give you—and look to Johnston for vertical turbines . . . and mixed flow and axial flow verticals as well. Sizes from 10 to 200,000 GPM, for heads from 5 to 4,000 feet.

Johnston Pump Company
1775 East Allen Avenue
Glendora, California 91740
(714-599-2351)

Johnston Pumps

DIESEL GENERATOR SETS

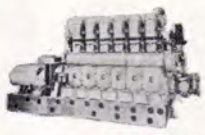
1

350 KW DIESEL GENERATOR SET

350 KW—120/240 volts DC—600 RPM—compound wound G.E. generator with switchgear. ENGINE: Ingersoll-Rand—heavy-duty type S—505 HP—10½x12—reconditioned to ABS.

2

250 KW DIESEL GENERATOR SET



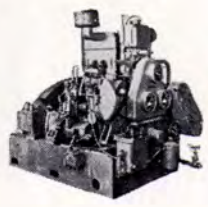
ENGINE: Enterprise 12 x 15 DSG-6 — 6 cyl. — 450 RPM crank No. 50J. GENERATOR: Westinghouse 250 KW—120/240 DC—1040 amps—450 RPM. Typical serial No. 3S-10P-913. Complete with switch gear.

3

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

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

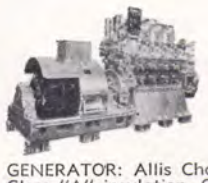
4



UNUSED 10 KW SUPERIOR DIESEL GENERATOR SET

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

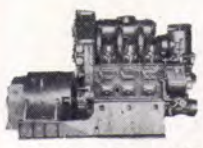
5



500 KW— 120/240 VOLT DC DIESEL GENERATOR SET EQUAL TO NEW

GENERATOR: Allis Chalmers—Compound wound. Has Class "A" insulation. Output 500 KW—120/240 volts DC—2080 amperes—720 RPM—drip-proof—self-cooling. Ambient 50°C—temperature rise 40°C. ENGINE: Model GM 8-278—2-cycle—Vee type—8½"x10½"—air starting—720 RPM. Complete with switchgear. Condition very good. Stilll aboard naval vessel. Has Ross shell & tube type lube oil & raw coolers—temp. control valve—shock mounts.

6



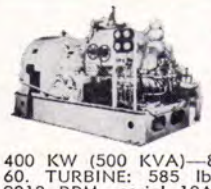
300 KW DIESEL GENERATOR SET

ENGINE: G.M. 6-278—6-cylinder—2 cycle—8¾"x10½"—750 RPM—with oil and water Ross Shell and Tube Heat Exchangers, instrument panel, pyrometer, etc. Vibro Isolators.

GENERATOR: G.E. 300 KW—120/240 volts DC—1250 amps—shunt wound—continuous overload rating 375 KW—2 hours—55° Weight of unit approximately 26,000 pounds. Complete with shock mounts. Unit 13' 2" long, 64" wide, 8' high.

TURBO GENERATOR SETS

7



400 KW WESTINGHOUSE TURBO GEN SETS FOR BETH. SPARROWS PT. HULLS 400 TO 4500; QUINCY HULLS 1600

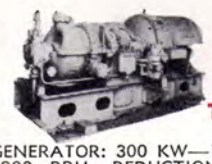
400 KW (500 KVA)—80% PF—1200 RPM—450/3/60. TURBINE: 585 lbs—840°TT—28½" vacuum—9018 RPM—serial 10A4462-3 & 10A4462-4. GEAR: 9018/1200 RPM. A.C. GENERATOR: 500 KVA—400 KW—450 volts—641 amps—80%PF—3 phase 60 cycle—1200 RPM—CR 40°—excitation amps 41—excitation voltage 120. Instruction book 5442. Switchgear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

8

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

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

9



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

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

10

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 operate 615 PSI—850°TT.

11

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

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

12

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

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

13

AP2 VICTORY WORTHINGTON-MOORE CROCKER-WHEELER 300 KW UNIT

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

14

UNUSED C-4

CROCKER-WHEELER

500 KW

GENERATOR ENDS ONLY

120/240 VOLTS D.C.—1200 R.P.M.

FORMERLY USED WITH WORTHINGTON-MOORE TURBINES & GEARS

Upgraded by U.S. Navy—rewound in glass. Generator Frame and Armature—Marine 500 KW type 3-1200—dripproof enclosure—base mount. Modified from Crocker-Wheeler generator frame 152HD — 240/120 volts DC — 2083/521 amps — 1200 RPM. Ambient temperatures 50°C. APPLICATION: For C-4-SA1; C4-SA-3; T-AP-134 vessels, using Worthington-Moore Turbine—Form S-6 and generator Form 14 x 10. No pedestal bearing.

15

WESTINGHOUSE 400 KW TURBO-GEN 835 LBS — 840°TT

Newport News Hulls 480—541 Esso ships. TURBINE: Westinghouse 835 lbs/840°TT—9018 RPM—6-stage —instruction book 1430-C1—serial 5A-7090-7 & 8. GEAR: 9018/1200 RPM. GENERATOR: Westinghouse 400 KW—440/3/60/1200 RPM—rewound field—instruction book 5442. EXCITER: 5.5 KW.

16

TWO 538 KW WESTINGHOUSE T-2 AUX. GENERATORS

(COMPLETE)

TURBINE: 538 KW @ 5010 RPM—438 PSIG—750°TT—28½" vacuum. GEAR: 5010/1200 RPM. A.C. GENERATOR: 400 KW 450/3/60/1200—0.8 PF. DC EXCITER: 32.5 KW—120 volts (variable voltage)—shunt—4-pole—DC excitation 5 KW. ALWAYS WELL MAINTAINED BY MAJOR OIL CO.

TURBINES & ROTORS

MAIN PROPULSION

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BETH. CLASS—13,600 H.P.

Sparrows Point & Quincy 1600 hulls. H.P. turbine casing only. Excellent blading & labyrinth packing.

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18

H.P. & L.P. COUPLINGS

1 Set—for Beth Class 13,600 HP 4400 hulls and Quincy 1600 hulls.

19

G.E. 6690 HP @ 7062 RPM HIGH PRESSURE 8-STAGE TURBINE

835 lbs—840°TT—#83341—originally built for Esso Christobol—Newport News.

T-2 TURBINES & ROTORS

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COMPLETE WESTINGHOUSE T-2 MAIN TURBINE—UNSHROUDED 6600 HP—435 PSI—750°F 28" VACUUM—3720 RPM

Instruction book IB-8345—type D—serial No. 5A-2124-6—unshrouded. Unit complete with all packing, stationary blading, linkage, governors, diaphragms, nozzles, etc. WILL SELL ROTOR SEPARATELY OR COMPLETE TURBINE CASING & ROTOR. Always well maintained by major oil company.

21

2 COMPLETE T-2 G.E. TURBINES

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

ROTOR WILL INTERCHANGE WITH ELLIOTT MAIN TURBINE

Will Sell Rotors Separately

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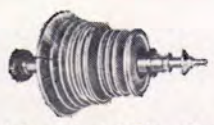

T2-SE-A1 MAIN PROPULSION ROTOR — G.E.

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

23

T-2 TANKER

UNUSED—4 UNITS AVAILABLE

AUX. G.E. TURBO GEN. ROTORS

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

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8500 H.P. 8-STAGE TURBINES FOR LARGE VICTORY SHIPS

L. P. – 3509 RPM
H.P. – 6159 RPM

LP Serial #77943—HP Serial #77942—Interchanges Ingalls C-3—Class 442 & Sun C-4 vessels—U.S. Navy Victory "Liberty".

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LP Serial #62042—HP Serial #62043—GEI 16263—Ridgeway Victory.

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G.E.—H.P. & L.P.—with throttle valve
Westinghouse—L.P.—with throttle valve
Allis-Chalmers—H.P & L.P.—with throttle valve

26 **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

27

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.

28

G.E. 8500 H.P. REDUCTON GEAR FOR LARGE AP3 VICTORY & C3

MD-48A—8500 HP—6159/3509/763/85 RPM.

29 **ALSO 6000 H.P. VICTORY AP2 REDUCTION GEAR**

Westinghouse 4A-1640.

PUMPS

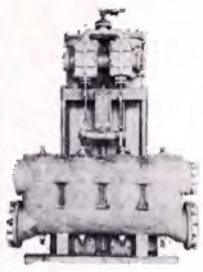
30

CARGO STRIPPING PUMPS

BRONZE T2 TANKER STRIPPING PUMPS

14x14x12—700 GPM at 100 lbs. Same pump available in steel for fuel oil transfer, etc.

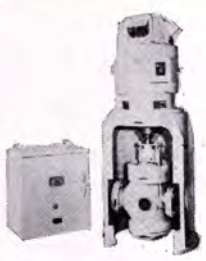
31



WORTHINGTON 16"x14"x18" VERTICAL DUPLEX STRIPPING PUMP

1400 GPM @ 110 PSI—suction lift 11.5 ft.—steam back pressure 15 lbs. Suction 14" — discharge 10"—steam 2½" — exhaust 4". Overall width 6'8"—overall height 9'1½" — depth 3'9½"—wt. approx. 10,000 lbs.

32



UNUSED DELAVAL IMO ROTARY PUMP

175 GPM—35 PSIG—10 HP—120 volts DC—1750 RPM—serial E-8619—frame 324 VY—76 amps—mfg. by Electro Dynamics. With magnetic control. Excellent condition.

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

Allis-Chalmers 6 x 5 pump, type SKH—1200 GPM—125 PSI—3500 RPM. Coppos turbine type TF-22-2½ — 3500 RPM. 273#—50° superheat.

34

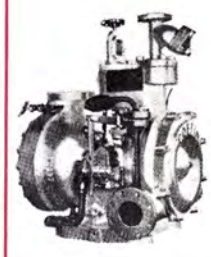
DAYTON-DAWD 2-STAGE FIRE AND BILGE PUMP

Vertical 2-stage type TDV-10—20 HP—200 GPM @ 184'—3" discharge—4" suction—1775 RPM—Maumee Sun. Motor: 120 volts DC—20 HP—1775 RPM.

BOILER FEED PUMPS

Suitable for Navy and Merchant Vessels

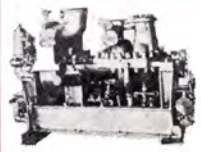
35



COFFIN TYPE CG-4A FEED PUMP

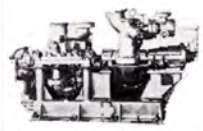
2 Available—very little use. Maximum 325 GPM—1760' head or 750 lbs Steam inlet 575 lbs. — 540°TT — exhaust 20 lbs. — speed 760 RPM.

36 **UNUSED DD445 CLASS WORTHINGTON TURBINE-DRIVEN FEED PUMP**



Worthington — drawing SL5043—425 GPM—1675' total dynamic head—5000 RPM 3-stage — double suction. Flanged 4½" inlet—4" outlet. Powered by Sturtevant steam turbine—282 HP—590 PSI. For Fletcher DD-445 Class Destroyers.

37



BUFFALO SIZE 4 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"x4"—built for USN DD destroyers. DD 445 Class Fletcher.

38

WORTHINGTON 3-STAGE UNUSED BOILER FEED PUMP

PUMP: 5" Worthington—460 GPM @ 750 PSI—5000 RPM—305 HP—steam flow 8052/hr—26.4 lbs HP hr. TURBINE: Sturtevant C-22—type 21—575# dry saturated steam—15 lb. back pressure—259°F water temperature—15 lbs/inch suction pressure.

39 **INGERSOLL-RAND BRONZE CARGO PUMP**

10GT—4500 GPM at 125 lbs.—2-stage—size 14x12.

40

C-25 CARGO PUMP TURBINE SPARE GEARS

One set of gears available for Westinghouse C-25 Cargo Pump Turbine.

MISCELLANEOUS

DOUBLE REDUCTION GEARS for Diesel Drive

41

3200 HP DOUBLE INPUT SINGLE OUTPUT DIESEL REDUCTION GEARS 20 DEGREE OFFSET

Farrell-Birmingham — 3200 SHP. REDUCTION GEAR: 1.81:1—handles two 1600 HP diesels @ 720 RPM. With hydraulic couplings & Fawick clutch. Port and starboard. Gear output 400 RPM. Suitable for dredge pumps. Non-reversing. OK for 38D8-⅛ engine.

42 **2:67:1 RATIO DOUBLE IN-LINE GEARS**

Farrell-Birmingham 3200 HP non-reversing — from seaplane tenders. Ratio 1.867:1. Complete with hydraulic couplings, etc. Will handle two 38D8-⅛ FM diesels. Has Fawick clutch.

43 **2100 HP DOUBLE INPUT SINGLE OUTPUT GEARS—3:435:1 RATIO**

Farrell-Birmingham — heavy duty — originally built for 2 heavy-duty direct-reversing engines —300 RPM—1050 HP each. Ratio 3.435:1.

44 **SINGLE ENGINE REDUCTION GEAR**

Farrell-Birmingham — non-reversing—1600 HP at 2.4909:1. With hydraulic couplings.

45 **ANCHOR WINDLASS**

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

46

SHARPLES LUBE & DIESEL OIL PURIFIERS

Type M-34-W22-UM—15,000 RPM. BOWL MOTOR: 2 HP—230 volts DC—8.5 amps—3450 RPM—250 to 300 GPH. Originally built for C-1-A diesel vessels.

47

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

20" Ex. inlet—⅝" CU-NI tubes—with or without air ejector.

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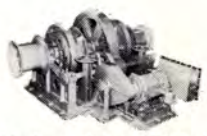
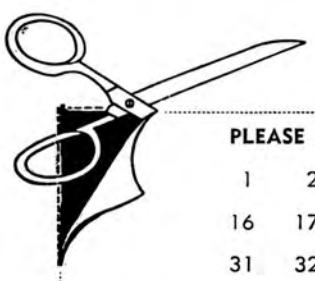


UNUSED 70 HP McKIERNAN-TERRY WINDLASSES

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.

INQUIRE FOR ALL OTHER ITEMS

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



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Design Considerations For

Offshore Oil Terminals

A Great Deal Is Being Done To Put Offshore Deepwater Terminals Along U.S. Coasts. More Research Is Needed On Certain Features.

Richard W. Black*

The need for U.S. deepwater oil terminals to receive crude oil from supertankers of 200,000 dwt to 500,000 dwt, and the environmental consequences of any spills which might result has been so widely discussed as to require no repetition. But in the face of a national energy crisis, it is important that a wider segment of the naval architectural profession and other marine-oriented groups become aware of the state-of-the-art in offshore terminals and related problems which will affect U.S. shipping prospects.

Table 1 — Transshipment Costs

Transshipment Terminal	Cost per Long Ton
2½ miles S.W. of Cape May, N.J.	$7.22
14 miles S.E. of Cape May, N.J.	7.33
Canco, Nova Scotia	7.77
Freeport, Bahamas	7.95

The feasibility of deepwater terminals on all three coasts has been confirmed in three basic Federal reports. The Maritime Administration investigated requirements and technical innovations which emphasized spill protection — "Offshore Terminal Systems Concepts"; the Corps of Engineers studied other design concepts which would be more comparable to existing terminal practice — "U.S. Deepwater Port Study"; and the Council of Environmental Quality reviewed the environmental consequences of all alternatives —"Interim, Short-Term Report on Superport Environmental Issues." The consensus was that deepwater terminals are needed primarily on the Gulf and North Atlantic Coasts, and that they can be built in such a way as to be economically viable and pose no significant threat to the coastal environment.

The United States has certain inherent limitations in ability to expand port channel depths. More than three-quarters of U.S. crude-oil-refining capacity exists on the East and Gulf Coasts where port depths cannot be economically dredged beyond 35-45 feet, while very large crude oil carriers (VLCCs) of over 200,000 dwt, which are expected to carry the major worldwide, long-distance crude-oil movements, have drafts of 60 to 90 feet, Figure 1. On the West Coast, where most inbound oil is expected to originate in Alaska, the relatively short voyage length will permit the economic use of tankers smaller than the VLCCs which would be used in the carriage of Persian Gulf crude oil to the East Coast. This factor, plus the natural deepwater of Puget Sound and a favorable bottom configuration in the Los Angeles/Long Beach area, makes the West Coast problem one that is more readily solvable.

*Mr. **Black**, Maritime Administration, U.S. Department of Commerce, presented the paper abstracted here before a recent meeting of the Chesapeake Section of The Society of Naval Architects and Marine Engineers.

A turning point occurred when the Council of Environmental Quality Report was issued. This provided evidence that from the standpoint of national environmental protection policy, the single-point mooring type terminal would be a superior alternative to either dredging to create near shore berths or dredging to offshore island terminals as proposed by the Maritime Administration. Up to that time, that agency had not advocated such a course, largely because of past public reaction against proposals to place SPM terminals off the coast of New Jersey. Also, rejected as a long-term solution was the current practice of lightering partial loads from tankers of around 100,000 dwt in the lower Delaware Bay to reduce draft to the 40-foot level required by the channel leading to the Delaware River refineries. In the expectation of a sharp future expansion of imports, this was considered to involve too great a chance of future groundings or collisions, despite the good safety record maintained up to that date in the lightering operations.

Another alternative considered was to avoid building deepwater terminals by developing tankers with greater deadweight within a 35-foot draft. This was not fully competitive with use of the largest VLCCs, but a more compelling reason for rejecting this lay in the fact that the 28.7 million tons of deadweight capacity in conventional tankers of over 200,000 dwt then in existence would otherwise be unable to serve United States requirements.

Offshore Island Concepts

The MarAd study presented five terminal concepts. The two proposed for the Delaware region will serve to illustrate costs for two alternative approaches for construction of artificial islands. One terminal, located 2½ miles southwest of Cape May, would cost $440 million, and the other terminal, 14 miles southeast of Cape May, was estimated to cost $490 million for the initial stages of development.

The basis for judgment as to whether such massive investments were justified was comparison to the best alternative course for development which was then open to the oil industry. To serve the North Atlantic region, that alternative would be to transship oil from VLCCs at a new terminal in Nova Scotia or in the Bahama Islands, and ship it directly to the East Coast refineries in foreign-flag tankers of about 65,000 dwt. According to the report, on the assumption that three times more oil would be shipped to Delaware refineries than to New York refineries, the weighted average cost, including pipeline fees would compare as given in Table 1. From this, it was concluded that the delivered cost, if oil were delivered through either of the proposed island terminals, would be competitive with the alternative of transshipping through a foreign port, and would be decidedly better than the current practice of direct shipment in vessels suited to U.S. port channels at a cost of $9.70 per ton.

It is a matter of national policy that deepwater oil terminals should be developed by private capital and that the Federal role should be limited to studies, research and regulatory matters. To minimize the risk and amount of such capital, the oil industry has proceeded to expand existing deepwater terminals which serve refineries in

(Continued on page 36)

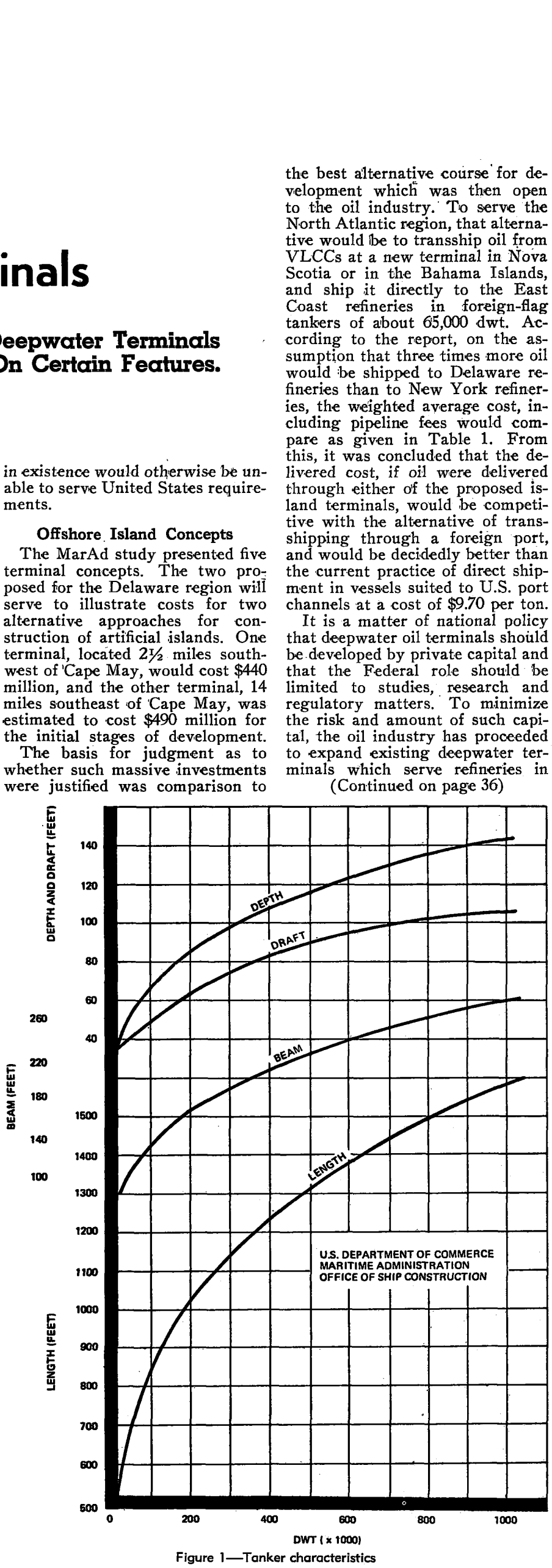


Figure 1—Tanker characteristics

new jumbo ferry specifies waukesha auxiliary power

You're looking at the world's largest double-end ferry . . . capable of carrying 2,000 passengers and 206 autos. She's the "Spokane", sister ship of the "Walla Walla," and part of the 21-vessel fleet of the Washington State Ferry System.

Auxiliary power for both jumbo ferries is all Waukesha. Two model L5792 DM gen-sets supply 550 kw each at 900 rpm for ship's service. Another Waukesha H1077 DM gen-set provides 100 kw at 1200 rpm for vital services. The fourth Waukesha, an H1077 DM is an emergency set ready to deliver 125 kw at 1800 rpm.

The exceptional reliability of Waukesha engine-generators is only one of many reasons for their increasing popularity. For the full story, ask your Waukesha Distributor for a copy of the new Marine Energy Systems Bulletin M-008. It's all in there for you.

DESIGNER: NICKUM & SPAULDING ASSOCIATES, SEATTLE

One of two Waukesha L5792 DM gen-sets which supply auxiliary power for the "Spokane".

WAUKESHA MOTOR COMPANY

WAUKESHA, WISCONSIN 53186

A BANGOR PUNTA COMPANY

Offshore Oil Terminals

(Continued from page 34)

Canada, Bahamas and the Gulf. This does provide deepwater transshipment capability now, but in the long run, it is in the national interest to encourage private development of offshore terminals in U.S. waters where submarine pipelines can bring in oil at minimum operating expense and environmental risk.

On the Gulf Coast, the same report chose to recommend the use of pile-mounted platforms for offshore berths instead of the artificial-island approach. This was largely because land was considered to be more readily available for the tank farm and related facilities, but the coastline and bottom configuration led to two different approaches. Off the Louisiana coast, deep water was found so close to the protection of South West Pass on the Mississippi Delta that no breakwater was proposed; but off the Texas coast near Freeport, a 6,000-foot breakwater was considered necessary to keep the predominant wave action at the berth within the predetermined limit of eight feet. To hold this breakwater cost within reason, it was necessary to place the terminal in water not over 60 feet deep, which required dredging a channel in from the 100-foot-depth contour. As a result, the Louisiana site was estimated to cost only $191 million, whereas the Texas site was estimated at $476 million. For both sites, the initial two-berth mooring platform with loading arms was estimated at $17.5 million. Despite emphasis on high berth availability, neither of these alternatives found favor within the oil industry.

Industry representatives indicated that differences in capital cost ranging from $191 million to $499 million to handle the same 100 million tons of oil per year at different locations was not as big a factor in the eyes of most oil companies as the uncertainty as to future environmental protection requirements and the costs which they might involve.

In the private sector, two proposals, each initiated by a different group of oil companies, have reached an active planning stage wherein only the granting of a permit is needed for initiation of full-scale design and construction. They are known as "Seadock," a proposal for a six-berth terminal about 30 miles off the Texas coast at Freeport, and "LOOP," a proposal for a five-berth terminal 19 miles off the coast of Louisiana just west of the Mississippi Delta.

Island Structures

A common type of deepwater oil terminal places the ship berth at a pile-mounted mooring platform offshore which supports the loading or discharge arms and which is connected by pipelines, either on a causeway, or on the sea bottom, to a tank farm onshore. But when land is not available for a tank farm, it becomes necessary to build a complete independent terminal offshore on an artificial island such as those discussed above for Cape May or Cape Henlopen. Certain distinctions are worth mentioning. A pile-mounted structure is needed in the 100-foot water depths where the ship must lie, while the artificial island is generally limited by cost to water depths of 50 or 60 feet. To absorb the energy of ocean waves, an island or a protective breakwater generally has a sloping face armored with heavy rocks or loosely interlocking concrete shapes.

The pile-mounted mooring platform, or sea-island as it is often called, must be heavily cushioned to absorb even the most gentle impact of a VLCC, the piles and structure which support the cushioning pads are built to bend and absorb unusually high loads independently, so as not to bend or damage oil pipelines. Such an installation exists at the Gulf Oil terminal at Bantry Bay. In that instance, the berth is protected from beam winds by the high hills on the sides of the long narrow bay. But at more exposed sites, the fixed mooring becomes impractical because of danger associated with approach and contact in the presence of ocean waves or heavy beam winds.

Single-Point Moorings (SPM)

The term "single-point mooring" refers to any system which will allow a tanker to swing freely about a single point under the combined effect of wind and current while discharging or receiving oil. Two basic classes of SPM are in use today: single-point mooring buoys, Figure 2, and single-point mooring towers.

Supertankers are relatively unaffected by short ocean waves, even when waves are too high for safe operation of service craft, but long swells can cause motions which put significant stresses on the mooring system.

It has been concluded that the ability of a tanker to swing freely in response to wind and current can reduce mooring forces to about one-tenth of what they would be if the ship were to be held at a fixed heading either by multiple moorings or by a fixed mooring platform. There are cases where a fixed-heading type berth is essential because of channel configuration, but that is not considered desirable for a fully exposed site. If a VLCC in light condition were to be at such a fixed platform when struck by strong beam winds and waves, departure might not be possible and severe damage to the ship or berth might result.

One reason why an SPM can be considered safe for open-ocean conditions is that, being able to always head into the wind, a tanker can safely depart in the face of a rising storm. But when without any form of wave protection, the SPM terminal, depending upon

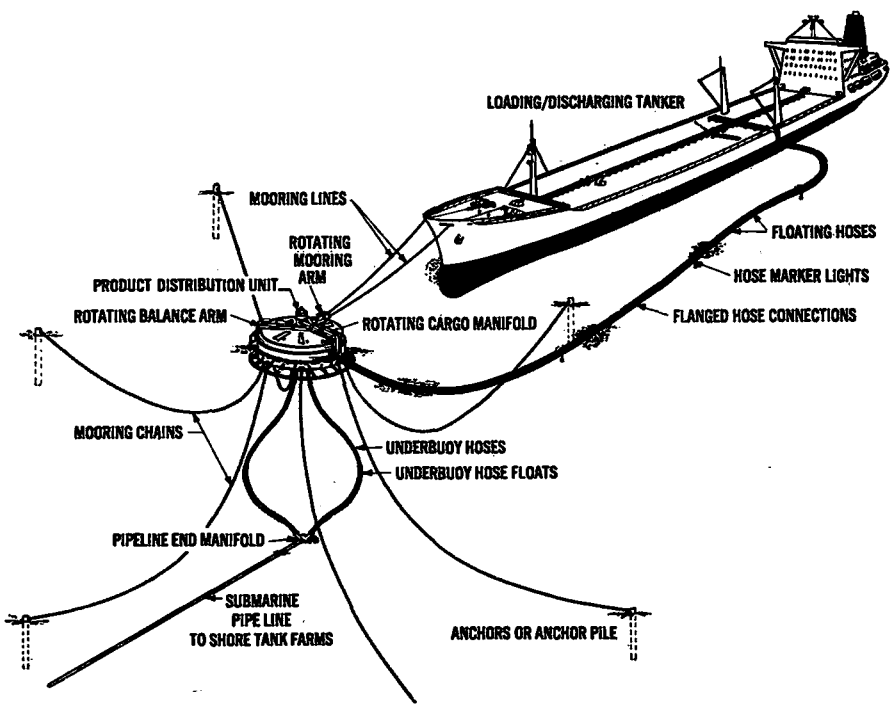


Figure 2—Catenary anchor-leg mooring

location, is sometimes limited to operating as little as 65 percent of the days of the year. It is to this situation that research is now being addressed by the Maritime Administration to improve productivity and safety in heavy weather.

SPM Operational Experiences

After 15 years of service experience, single-point moorings can be designed to be one of the safest and most economical means for the transfer of oil to and from vessels offshore. But this ability requires close scrutiny of past operating experience in the light of the particular wind, wave, current and sea bottom characteristics of the site proposed, as well as the size, maneuverability and equipment of the ships which will use the mooring. This type of examination has been facilitated through the efforts of the Single Point Mooring Forum, or its successor, the Buoy Mooring Forum.

This is an international body composed of operators of single-point moorings. Its function is to handle voluntary exchange of operational experience and to encourage standardization. The organization is now expanded into other areas of mutual interest such as piers and docks, as well as safety and environment. It is not widely known by the public that this body is continually working to identify problems as soon as they can be detected and to develop practical solutions.

While many SPMs all over the world are now in existence or are planned, our attention should be addressed primarily to those designed for the larger size vessels. A summary furnished by the Forum lists the moorings as given in Table 2. This list does not include the six SPMs planned by "Seadock" or the five SPMs planned by "LOOP" because, as of this writing, permits for construction have not yet been granted. These units are intended for ships up to 500,000 dwt.

Conclusions

It should be apparent from this paper that much more is being done to bring offshore deepwater terminals into reality for the United States than is generally realized by the public. The Federal Government, the states affected, and the oil industry are working together to insure that terminals will be built with capacity to meet U.S. needs, and with safety which is compatible with the National Environmental Policy Act of 1969.

The need for terminals for very large tankers exists on both the Gulf and Atlantic Coasts, but development progress is more advanced in the Gulf, where industry pressure is strong and petro chemical development is more welcomed than on the Atlantic Coast.

The development of the terminals proposed off the coasts of Texas and Louisiana will produce, when fully developed, a combined import capability for crude oil totaling something on the order of eight million barrels per day. Other proposals are ready for developing on all three coasts when and if permits are granted.

Although the basic technology for building SPMs on the U.S. continental shelf is at hand, improvement of methods of handling and maintaining floating hose systems, as well as picking up moorings in adverse weather is desirable to extend the productivity of such terminals, and to insure pollution-free operation under heavier sea states.

Table 2 — Offshore Mooirngs for Large Tankers

Ship Size	Number Built	Number Planned
Under 100,000 dwt	48	2
101-200,000 dwt	25	6
201-300,000 dwt	29	11
301-400,000 dwt	3	5

Johnston Elected Vice President Of ABS

William N. Johnston

William N. Johnston, formerly assistant to the chairman of American Bureau of Shipping, was elected vice president, it was announced by **Robert T. Young,** the chairman and president of ABS.

A native of Mobile, Ala., Mr. **Johnston** was graduated from Alabama Polytechnic Institute with a B.S. degree in mechanical engineering, and Massachusetts Institute of Technology with a B.S. degree in naval architecture and marine engineering.

He joined ABS in 1951, and was a surveyor for seven years in Europe and eight years in the United States before being appointed principal surveyor of the New Orleans, La., office. Mr. **Johnston** was then appointed principal surveyor for Western Europe in 1968 and returned to the United States in 1972, when he was appointed assistant to the chairman. Mr. **Johnston** is a member of The Society of Naval Architects and Marine Engineers, the Institute of Marine Engineers, the American Welding Society, and the Royal Institution of Naval Architects.

NWTI Offers Course At Sturgeon Bay On Marine Construction

In the fall of 1974, a new one-year diploma educational program in Maritime Construction will open on the Sturgeon Bay campus of Northeast Wisconsin Technical Institute, Sturgeon Bay, Wis. Enrollments are now being accepted for the first class, according to **Donald Henderson,** area supervisor. The program has been given official approval by the Wiconsin Board and the Northeast Wisconsin Vocational, Technical and Adult Education District Board.

Objectives of the Maritime Construction program are to prepare students with job entry skills to enter the shipbuilding and/or repair field. Related skills are to include shipfitting, lofting, welding, pipefitting and electricity as used in the maritime industry. Those employed in the industry may take the program for the upgrading of skills and for job advancement.

NWTI establishes the Maritime Construction program on a full-time basis in response to a survey of the industry.

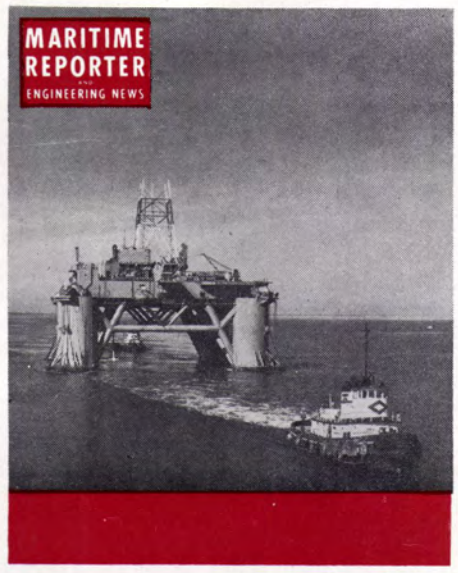
Details of the program were developed by NWTI with six members of a Maritime Construction Advisory Committee. Committeemen include **Gerald Hintz** of Peterson Builders, Inc., **Robert Boler** of Palmer Johnson, Inc., **C.A. Hunter** of Bay Shipbuilding, all of Sturgeon Bay; **Jim Derusha** of Marinette Marine Corp., Marinette; **Wally Markham,** Carver Boat Co. of Pulaski, and **Roy Thompson** of Cruisers, Inc., Oconto.

Northeast Wisconsin Technical Institute-Sturgeon Bay Campus is completely equipped to offer the program. Special equipment to be acquired prior to the opening of the program includes special ship models of hulls and section models of hulls for showing ship construction and how and where various lines and starting points originate.

Mr. **Henderson** said that the new Marine Construction program training will fall into five main categories called shipbuilding technology, namely, (1) Shipfitting, (2) Metal Fabrication, (3) Soft Material Fabrication, (4) Electrical and Piping, and (5) Mechanics. He said the dictionary of occupational titles lists over 90 occupations which relate to the ship and boatbuilding industry.

For further information, contact Student Services Department, Northeast Wisconsin Technical Institute, 229 North 14th Avenue, Sturgeon Bay, Wis. 54235.

THESE MEN ARE ***YOUR*** CUSTOMERS AND PROSPECTS IN THE MARINE INDUSTRY



IN VESSEL OPERATIONS

Directors, owners, agents, presidents, vice-presidents, managers, secretaries, treasurers, port engineers, superintendents, purchasing agents, port captains, port stewards, naval architects and engineers shoreside

IN SHIPYARDS

Directors, owners, presidents, vice-presidents, secretaries, treasurers, superintendents, managers, purchasing agents, naval architects, engineers and chief draftsmen

PROFESSIONAL MEN

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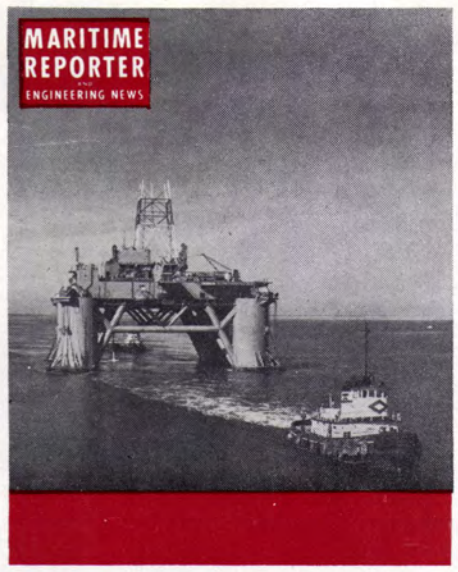

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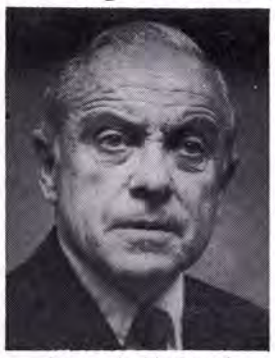
United States Lines Names James McQuaid Purchasing Director



James A. McQuaid

James A. McQuaid has been named director of corporate purchasing for United States Lines, it was announced by **Edward J. Heine Jr.**, president of the company.

Mr. **McQuaid** was previously with the Ingalls Shipbuilding Division of Litton Industries, where he was director of material operations. Prior to that, he was manager of inventory and assistant director of purchasing for Maryland Shipbuilding & Drydock Company.

He is a graduate of Niagara University, where he earned a B.S. degree in business administration.

United States Lines operates an all-modern fleet of 30 vessels serving various areas of the world. Sixteen high-speed high-capacity containerships maintain a 15,000-mile Tri-Continent Service between Europe, the East and West Coasts of the United States, Hawaii, Guam and the Far East. The company also has 14 fast Challenger Class general cargo vessels engaged in commercial and chartered services in the trans-Atlantic and trans-Pacific areas.

ABS Elects Five To Board of Managers —New Members Named

Elected to the board of managers at the annual meeting of the members of the American Bureau of Shipping, held in New York, N.Y., on March 19, were: **John V. Banks,** chairman and president, National Steel & Shipbuilding Company; Capt. **Leo V. Berger,** president, Avon Steamship Company; **Edward J. Heine,** president, United States Lines Company; **J.J. Henry,** president, J.J. Henry Co., Inc., and **Ward K. Savage,** vice president, Texaco Inc.

The board of managers is the governing body of the American Bureau of Shipping, an international ship classification society which establishes standards for the design, construction, and periodic survey of merchant vessels. The membership of ABS is composed of shipowners, shipbuilders, marine underwriters, designers, and other persons prominently identified with maritime commerce.

Ten men were elected as new members of the Bureau. They are: **Arthur E. Brunck,** vice president, General Reinsurance Corp., New York, N.Y.; Rear Adm. **John D. Chase,** USN, Director, Military Sea Lift Command, Washington, D.C.; **Henry E. Froebel,** president, Frank B. Hall & Co. of New York Inc., New York, N.Y.; **Edwin Hartzman,** president, Avondale Shipyards, Inc., New Orleans, La.; **Bernard T. Kelley,** president, Hillman Barge & Construction Co., Pittsburgh, Pa.; **O.R. Menton,** general manager-marine department, Exxon Co., U.S.A., Houston, Texas; **M. Lee Rice,** president, Ogden Transport Corporation, New York, N.Y.; **Lester Rosenblatt,** president, M. Rosenblatt & Son, Inc., New York, N.Y.; **Frank W.K. Tsao,** chairman, International Maritime Carriers Ltd., Hong Kong, and **K. P. Yang,** chairman of the board of directors, China Union Lines, Ltd., Taipei, Taiwan.

Arctic Offshore Corp. Asks Title XI To Build 2 Tug/Supply Vessels

A Title XI application in connection with two ocean tug/supply vessels has been filed by Arctic Offshore Corp., 701 North Post Oak Road, Houston, Texas. The two vessels, to cost a total of $4.4 million, will be built by Texas Maritime Industries.

Eaton Corporation's Industrial Drives Div. Names Stanley Morgan

Raymond E. Mack, general manager of Eaton Corporation's Industrial Drives Division, has announced that **Stanley E. Morgan** has been named marketing manager of the division. Mr. **Morgan** succeeds **Walter E. Gregg Jr.,** who retired after 15 years of service with Eaton.

Mr. **Morgan** started with Eaton in January 1971 as the sales manager for Industrial Drives Division's Dynamatic Plant. In his new position, Mr. **Morgan** will be directly responsible for the division's domestic and international marketing activities and will supervise marketing policies and procedures for the entire division.

A graduate of Mississippi State University, with a degree in electrical engineering, Mr. **Morgan** joined Eaton with 20 years of experience in the field of sales and engineering. He is succeeded by **Clarence L. Griffin Jr.,** who has been appointed the new general sales manager at the Dynamatic Plant.

Mr. **Griffin** joined Eaton in 1967 as district manager of the Dynamatic sales office in Boston. He attended the New York State University in Buffalo and is a registered professional engineer.

Eaton's Industrial Drives Division manufactures a complete line of industrial air, magnetic, hydraulic clutches and brakes; AC, DC and eddy-current adjustable speed drives; speed reducers and variators; belts and belt drives and custom gearing.

Stanley E. Morgan

For more information, contact Eaton Corporation, Industrial Drives Division, 9919 Clinton Road, Cleveland, Ohio 44111.

Eaton is a worldwide manufacturer of automotive, truck, materials handling, industrial and consumer products. The company's sales for the year 1973 were $1,550,147,000, and net earnings were $85,601,000 or $4.84 per share.

Boston Fuel Trans. Names John Curry Operations Manager

John F. Curry

Vincent D. Tibbetts, president of Boston Fuel Transportation, Inc., announces the appointment of **John F. Curry** as operations manager.

Mr. **Curry** joined BFT, Inc. following his retirement from the U.S. Coast Guard on January 31, 1973. At the time of his retirement, Mr. **Curry** had served more than 26 years on active duty, including six years in the Marine Inspection Offices in New York and San Juan. He retired with the rank of commander.

A graduate of Northeastern University, Mr. **Curry** is a native of East Boston, Mass., and resides in Stoughton, Mass.

N.Y. Port Engineers To Hold Dinner-Dance

The 26th annual dinner-dance of The Society of Marine Port Engineers New York, N.Y., Inc., will be held on May 11, 1974, in the main ballroom of the Statler-Hilton Hotel, New York City, the organization has announced.

Carrier Transicold Refrigeration Units Ordered By PFEL

Carrier Transicold Company, Syracuse, N.Y., has received a contract to provide 200 container refrigeration units to Pacific Far East Line, Inc. (PFEL) of San Francisco, Calif.

The units feature Varipowr, Carrier Transicold's unique capacity control system of compressor cylinder unloading which saves power and fuel, reduces produce dehydration and prevents freeze damage to fresh produce. All of the units are capable of carrying sensitive chilled commodities in addition to hard-frozen loads.

The PFEL units are Carrier Transicold's most recent version of its lightweight aluminum-frame all-electric "picture-frame" type. Each is fitted for operation with TECTROL, the inert gas that prohibits product ripening. The atmosphere created when TECTROL is mixed with normal air helps solve shippers' quality problems by prolonging product shelf life.

Waukesha Bearings' New Aft-Tube Seal Liner Design Report

Waukesha Bearings Corporation has published an eight-page report describing the design and applications of a new coated liner which extends operational life and reliability of the aft stern tube seal in both salt water and fresh water shipping operations.

The report also details joint research undertaken by Waukesha Bearings Corporation and the Coatings Service Department of Union Carbide Corporation to upgrade both forward and aft seal liners. Particular emphasis is given to the use of a wear- and corrosion-resistant ceramic coating in the new design and the reliability of the new liner in sea water.

Further information may be obtained by contacting **Eric Dow,** Manager, Sales & Service, Waukesha Bearings Corporation, P.O. Box 798, 405 Commerce Street, Waukesha, Wis. 53186.

Common Brothers Offers Booklet On Ship Management

Common Brothers (Management) Limited, part of the Common Brothers Shipping Group which is based in Newcastle upon Tyne, England, has published a new booklet entitled "Ship Management."

Ship management is still a relatively new innovation in international shipping, but it is already playing an important role in the efficient operation of shipping fleets and making a substantial contribution to profits.

As operated by Common Brothers, ship management relieves the owner of the physical running of his fleet, enabling him to concentrate solely on maximizing profits and the strategic employment of his vessels.

The company offers a comprehensive range of services embracing maintenance and repair, manning, training, stores supervision, insurance and budget control. An owner may use the whole range of services or select the combination which suits his particular operation.

At present, Common Brothers (Management) Limited manages 24 ships ranging from VLCCs and oil storage vessels to container and ro/ro ships.

The booklet is available to interested persons in order to enable the services offered by Common Brothers to be understood more fully. For further details, contact The General Manager, Common Brothers (Management) Limited, Exchange Buildings, Quayside, Newcastle upon Tyne NE1 3AB, England.

Towboat Association Elects Don Foss

Don Foss of Puget Sound Freight Lines has been elected president of the Northwest Towboat Association. Other officers are **J.D. Minkler,** vice president; **Gene Hickok,** treasurer, and Rear Adm. **Ken Ayers,** executive secretary.

Directors are **Vernon Russell, W.H. Epping, Richard Osborne,** and **Churchill Griffiths.**

James Stevedores Elect Ibos And Schroeder VP

James Stevedores, Inc., 2 Canal Street, New Orleans, La. 70130 have announced the election of **Bertrand J. Ibos** and **Jurgen R. Schroeder** as vice presidents of the company.

Mr. **Ibos**, who is responsible for stevedoring matters in the east Gulf, has advanced from general superintendent. Mr. **Ibos** is a native of New Orleans, La,, and attended Loyola University. He has served in various office and dock capacities prior to advancing to general superintendent.

Mr. **Schroeder** is a native of Germany, where he served as a merchant marine officer with several shipping companies. He relocated to Texas in 1966. He served with various stevedoring and terminal operators in Houston until 1970, when he joined the James organization as general superintendent.

Shock Analysis Methods Discussed At Meeting Of SNAME Philadelphia Section

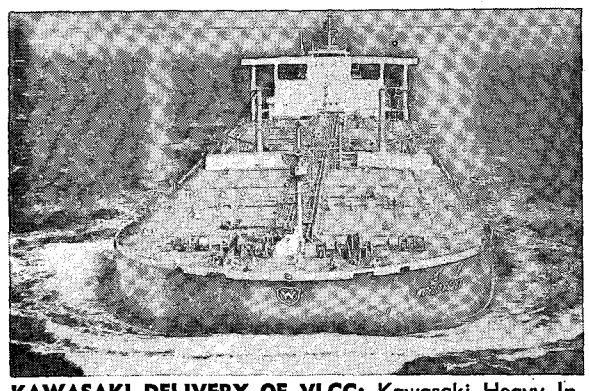
Principals of the Philadelphia Section meeting, left to right: Section chairman **Thomas J. Kavanagh;** authors **Brian C. McNaight, Robert P. Brooks,** and **Neil Goodis,** and meeting coordinator Capt. **J.M. Dunford,** USN (ret.).

On the evening of March 15, the Philadelphia Section of The Society of Naval Architects and Marine Engineers gathered at the Engineers' Club in Philadelphia to hear the presentation of "Simulation of Shock Platform Tests—A Design Tool." **Robert P. Brooks, Neil Goodis,** and **Brian C. McNaight,** all of the Naval Air Engineering Center, Philadelphia, reported on their successful efforts to mathematically model the physical reactions of equipment to shock tests performed on floating shock test platforms. A film, "Shock Test of Heavy Equipment," gave the audience an understanding of the physical situation which the authors sought to model. In their verbal presentation of their work, the authors described how finite difference techniques were applied to a spring-mass model of an A4C aircraft mounted on the Navy's Medium Shock Test Platform. Using this method, the authors obtained results which were very close to the results of the actual test.

In commenting on the paper, **David Hirt,** NAVSEC Headquarters, said that most analytical methods for shock analysis either involve approximations or are based on tests of particular equipment and are not generally applicable to other types of equipment. The shock analysis method developed by the authors applies the basic laws of physics to the problem and is more flexible than earlier methods.

The authors' mathematical model of the floating shock test platform allows equipment vendors who must meet Navy shock specifications to simulate on a computer the actual shock test of their equipment. The results of the computer test allow the equipment vendor to identify and correct any weaknesses in the equipment prior to the physical test on the shock test facility.

Section chairman **T.J. Kavanagh** of the Philadelphia Naval Shipyard conducted the meeting, which was coordinated by Capt. **J.M. Dunford,** USN (ret.), formerly with the Naval Air Engineering Center, Philadelphia, and currently with CDI, Inc. in Jacksonville, Fla.



KAWASAKI DELIVERY OF VLCC: Kawasaki Heavy Industries, Ltd., has delivered the VLCC World Comet (shown above), constructed at the Sakaide Works, to the River Cape Shipping, S.A. of Panama. The approximate measurements and principal particulars of the vessel are: deadweight, 229,480 LT; length overall, 1,049 feet; breadth, molded, 174 feet; depth, molded, 83 feet, and a draft of 64 feet. The vessel is powered by a Kawasaki UA turbine engine with a maximum continuous output of 36,000 hp at 90 rpm to provide a service speed of 16.12 knots at full load. She is classified N.K., and has a complement of 36.

Western Gear Corp. Appoints C.M. Hotes

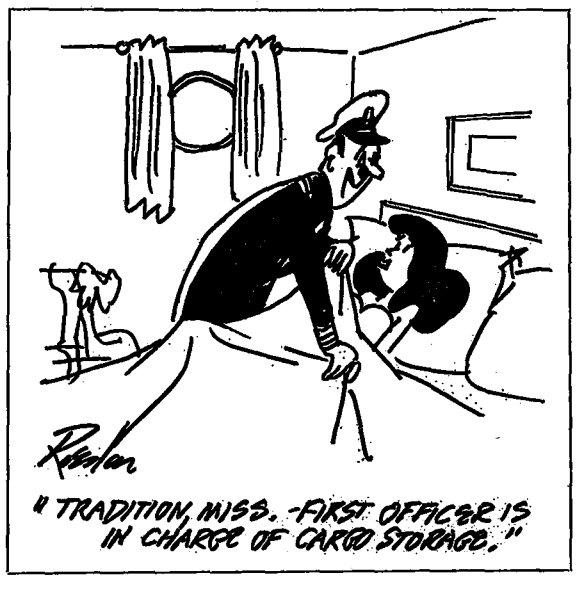
C.M. Hotes, who has held various engineering and sales executive positions with Westen Gear Corporation over the past 15 years, has been named director of corporate marketing for the firm's Southwest sales region, with offices at Houston, Texas.

Mr. **Hotes** has been associated with Western Gear in various capacities, ranging from sales engineer to divisional manager of engineering at the Heavy Machinery Division plant in Everett, Wash. Most recently, he was offshore technical director and is co-holder of a patent on the company's proprietary line of Pipemaster pipe tensioners, used extensively in laying submarine pipelines.

Offshore oil development equipment, which Mr. **Hotes** helped develop and sell, includes heave compensators, riser and guideline tensioners, pipe rackers, and the pipe tensioners, all in widespread use around the world.

A graduate of the University of Washington with a B.S. degree, Mr. **Hotes** is a native of Boise, Idaho. He will report to **I.F. Richardson,** vice president, marketing, at the Lynwood, Calif., executive offices.

Western Gear's Southwest regional offices are at Suite 400, Two Greenway Plaza East, Houston, Texas 77046.



Canadian Chief Of Ships Addresses Northwest Section

Pictured above during the meeting of the Pacific Northwest Section, left to right: **Jacques Heyrman; Bob Cullen; Graham Lockhead,** author; **Jim Shepard,** chairman of the B.C. Area, and **Derek Thompson,** B.C. Area secretary.

A regular meeting of the Pacific Northwest Section of The Society of Naval Architects and Marine Engineers was held on February 8, 1974, at the Royal Vancouver Yacht Club in Vancouver, British Columbia.

The speaker for the evening was **Graham Lockhead,** who is Chief of Ships and Components for the Canadian Department of Trade, Industry and Commerce. His topic for the evening was "Marine Research—Development Program—Federal Government."

In his presentation, Mr. **Lockhead** informed the group of the various Government subsidy programs available to Canadian industry, and in particular, to organizations in the marine field. He indicated that the emphasis of the various programs was to stimulate progress in the marine and related fields in Canada. The programs he discussed were in addition to the ship subsidy program which is, of course, available to qualified ship construction programs in Canada.

Upon completion of the evening talk, **George Forbes** of Burrard Drydock Co., Ltd. thanked Mr. **Lockhead** for his comments.

Ro/Ro Containerships Carry American And Canadian Logs From Nova Scotia To Liverpool

A new regular roll-on/roll-off service of Canadian timber between Halifax, Nova Scotia, and Liverpool, northwest England, has proved so successful that new techniques are being developed by Atlantic Container Line, Ltd., to handle this type of cargo.

Up to 400 tons of sawed timber and logs are being shipped every week via ACL's fleet of roll-on/roll-off containerships. Each sailing brings 10 trailers containing 16 standards of packaged spruce.

The speed and convenience of the roll-on/roll-off handling of timber shipments has created considerable interest in the North American timber trade. In addition, ACL is handling oak logs from Virginia, which arrive at the Canadian terminal by railcar.

Because of their variable dimensions, the logs are difficult cargo to ship, and ACL has developed new techniques to make the fullest utilization of the trailers, but new methods are also being investigated to meet the heavy demand from the packaged timber trade.

Capt. **Michael England,** ACL's terminal manager at the new Royal Seaforth Dock, Liverpool, has visited the United States and Canada for discussions with the timber trade.

ACL operates a fleet of 10 ships on the North Atlantic between Europe and North America. These have the flexibility to carry up to 800 containers and all kinds of cargo not suitable for containerization. There is a mile of roadway in the ships for the carriage of cars, trailers and heavy mobile plant and equipment.

French Yard To Build Four Refrigerated Banana Ships

Compagnie Generale Maritime recently placed an order for the construction of four refrigerated container carriers with Chantiers de France-Dunkerque.

These technically advanced vessels to be built in the Dunkerque yard will be the first ships to be provided with a new system of refrigerated containers, specially designed for the transport of bananas. Roll-on/roll-off facilities will be arranged aft.

The delivery of these ships will be spread over one year, from the end of 1977 until the end of 1978.

Brochure Available From SideBand Associates

SBA-SideBand Associates, Inc. of San Jose, Calif., have announced the availability of literature describing an addition to their line of HF Single Side Band Radiotelephone Equipment.

At the present time, SBA is producing and selling the model SBA-301M, a six-channel 100-watt PEP semicolumn. The model SBA-312, which has a 12/24 channel capability nominal 150 PEP output, covers a frequency range of 2 to 23 MHz.

The new model introduced is the SBA-312B, a ruggedized version of the SBA-312, which has continuous duty operation covering the same frequency range and rated at 150 watt PEP, the average. Various options and accessories are available for each model mentioned, including a 1-kw linear amplifier.

Complete literature and information can be obtained by contacting the company at 1133 Old Bayshore Highway, San Jose, Calif. 95112.

FOR GAS TURBINE TANKER: A 12,500-maximum-horsepower electric motor is shown being lowered into the hull of a 650-foot gas-turbine-powered oil tanker currently under construction at FMC Corporation's Marine and Rail Equipment Division, Portland, Ore. The continuous-speed electric motor is part of a new gas turbine-electric drive power plant developed by General Electric Company. This self-regulating system is designed for remote operation, greatly reducing crew complement requirements. The FMC Division, formerly Gunderson, Inc., is building six of these tankers, the largest ships ever constructed in Portland. The tankers will be operated by Chevron Shipping Company, San Francisco, Calif. The first vessel is scheduled for delivery this fall.

GM Diesel Engine Plant At Indianapolis Approved By Lloyd's

The Detroit Diesel Allison Division of General Motors Corporation has been granted approval for the production of oil engines under the Lloyd's Register scheme for the approval of batch and line produced machinery and components.

The division's Plant 5 at Indianapolis, Ind., manufactures the Model 149 series diesel engine, a Vee type, on a new production line. This plant has taken over all manufacture of the Model 149 series engine from the company's Detroit operations.

The Detroit Diesel Allison Indianapolis plant has been primarily involved in the production of gas turbine engines for the aircraft industry, and the high standard of quality control achieved in this field is being maintained on the diesel engine production line.

The Lloyd's Register scheme has been operating successfully for five years. Under it, a company's works and quality control procedures are examined by the Society's surveyors in order to verify compliance with the Society's requirements.

After approval, the procedures are kept under continuing surveillance by regular visits from the Society's surveyors to ensure that the approved standards are maintained.

The requirements for approval are listed in the Society's Rules for the Construction of Steel Ships.

Although the scheme was originally introduced for items of marine machinery and components, it has also been applied successfully to batch and line produced items for other industries, for containers, and prepacked mortar for use in rendering ferrocement yachts and fishing vessels.

Rudder Club Names Giardino To Chair Maritime Night Dinner

Thomas J. Giardino

The Rudder Club, Inc., Brooklyn, N.Y., for its "Tenth Annual International Maritime Night Dinner," has appointed **Thomas J. Giardino,** traffic manager of the Marchessini Steamship Lines, general chairman, according to the newly elected commodore of the club **Andrew W. D'Alessandro,** import sales manager of American Export Lines. Also appointed as dais chairman for the affair was **Berndt M. Palmer,** president of Lee & Palmer.

The dinner will be held in the Grand Ballroom of the Commodore Hotel in New York City on Wednesday, April 24, 1974.

Clifford M. Palmer, *vice president of Lee & Palmer and outgoing commodore of The Rudder Club, Inc., is shown turning over the gavel to the newly elected commodore of the club,* **Andrew W. D'Alessandro,** *import sales manager of American Export Lines.*

The Rudder Club, which is one of the largest maritime organizations in the country and which is known for its educational grants for many years, aggregating over $120,000, has chosen that evening to honor the top executives representing American, as well as foreign steamship lines serving The Port of New York and New Jersey.

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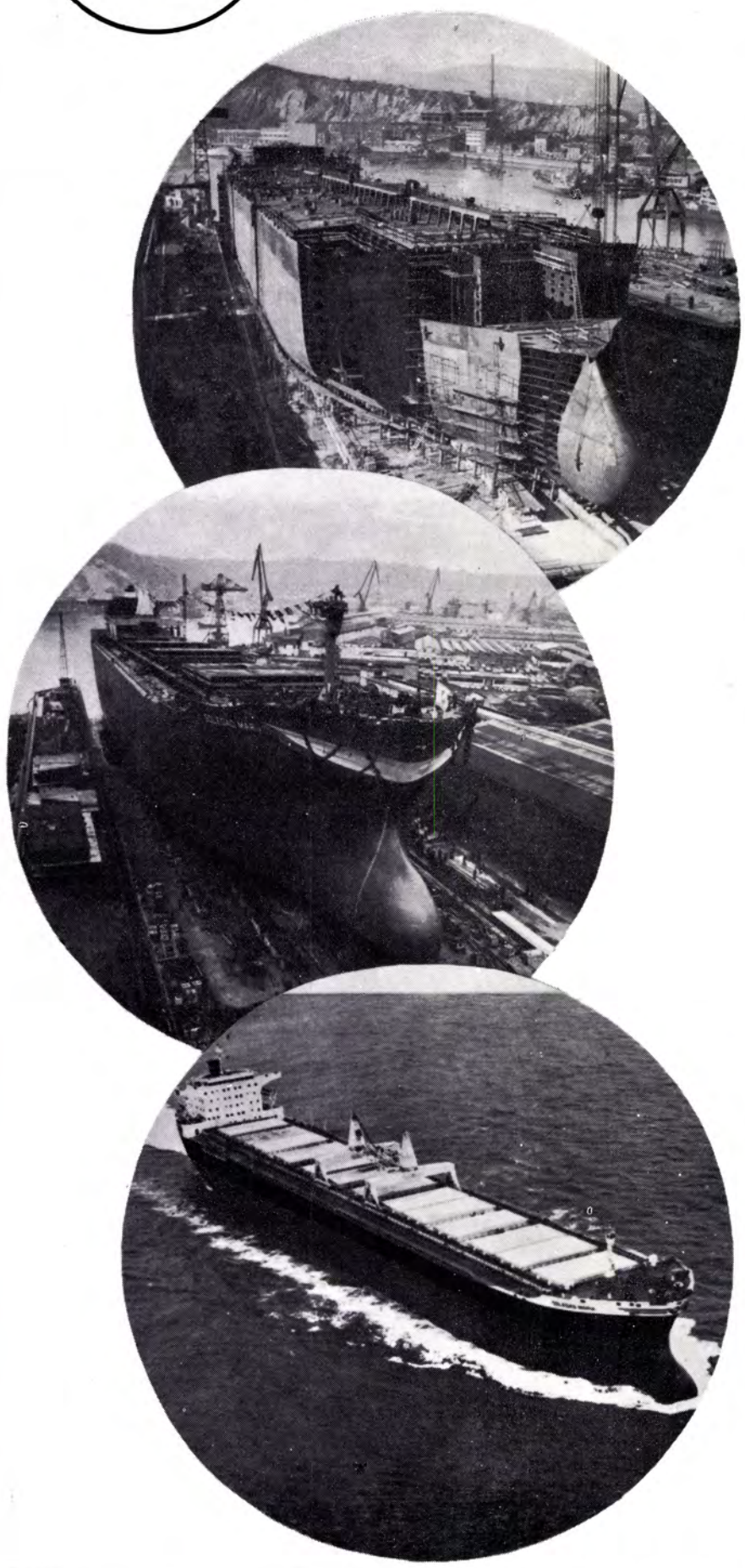

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Capt. Dickieson To Key Post For New Hydrofoil Operation

Capt. **Robert W. Dickieson,** USN (ret.), has been appointed as director of maintenance and logistics for Pacific Sea Transportation, Ltd., a Hawaii Company which will operate an interisland hydrofoil service under the name SeaFlite. SeaFlite will provide daily scheduled service between the islands of Oahu, Kauai, Maui, and Hawaii, utilizing three 929 Jetfoils ordered from the Boeing Company. SeaFlite headquarters are located at 233 Keawe Street in Honolulu.

Captain **Dickieson** enlisted in the U.S. Navy in 1942 and was appointed to the Naval Academy in 1944 by the Secretary of the Navy. Captain **Dickieson** attended the U.S. Naval Postgraduate School and the University of California to earn a master's degree in physics and graduated from both Nuclear Power School and Guided Missile (Polaris) School. He served as Executive Officer of the USS Stickleback (SS415), USS Bream (SS243), and the USS Scamp (SSS 588), and as Commanding Officer of the USS Sculpin (SSN 590); USS U.S. Grant (SSBN 631) (BLUE); USS Kamehameha (SSBN 642) (GOLD); and USS Mariano G. Vallejo (SSBN 658) (BLUE).

From August 1968 to August 1970, Captain **Dickieson** commanded the Fleet Submarine Training Facility (now called the Submarine Training Center, Pacific) with headquarters at Pearl Harbor, Hawaii.

Capt. Robert W. Dickieson

He next commanded the USS Nereus (AS 17), a submarine tender based at San Diego, Calif. He served on Admiral **Gayler's** staff as Chief of the Nuclear Operations/Safety Branch at CINCPAC Headquarters, Camp Smith, Hawaii, immediately before retirement in February 1973.

Captain **Dickieson** assumed his present post with Pacific Sea Transportation, Ltd. on March 6, 1973, shortly after his retirement on February 1, 1973.

Ocean Science Lab; Wave Tank Planned For Corpus Christi

Southwest Research Institute, a nonprofit applied research organization headquartered in San Antonio, Texas, has announced plans for construction of an Ocean Science and Engineering Laboratory in Corpus Christi. The announcement was made by SwRI president **Martin Goland.**

Plans call for immediate construction of a 200-foot by 85-foot wave tank facility for simulation of ocean wave action. The 10-foot-deep tank will be capable of creating waves as high as four to five feet.

Model offshore structures will be tested in the wave tank for structural integrity under constant wave action. In addition, the facility will be used to evaluate various methods of prevention and control of sea fires caused by oil spillage.

Future plans call for the construction of an 11,000-square-foot laboratory-office building adjacent to the wave tank facility. The building will provide expanded laboratory and office space for the ocean science activities of the SwRI Department of Structural Research and Ocean Engineering, which now has quarters in downtown Corpus Christi.

The Ocean Science and Engineering Laboratory will be located in the Rincon Industrial Park on Corpus Christi Beach and will provide mooring facilities for the 60-foot vessel Researcher I, the 35-foot Researcher II, and the fleet of auxiliary vessels.

James F. Dages Named President At Brewer-Titchener

James F. Dages

The Joslyn Mfg. and Supply Co. has announced the appointment of **James F. Dages** as president of its subsidiary in Cortland, N.Y., the Brewer-Titchener Corporation. The announcement was made by **Joseph W. Rittenhouse,** Joslyn's chairman and president.

Mr. **Dages** replaces **Edward C. Telling,** who recently resigned.

As president of Brewer-Titchener, Mr. **Dages** also assumes responsibility for the Boston and Lockport Corporation, East Boston, Mass., and Midwest Control Products Corp., Bushnell, Ill. Both are subsidiaries of Brewer-Titchener.

Since 1965, Mr. **Dages** has undertaken a wide variety of management assignments for Joslyn at its corporate headquarters in Chicago, Ill. He holds a bachelor's degree in accounting from De Paul University, and an M.B.A. degree from the Executive Program of the University of Chicago.

Lykes Bros. Steamship Signs Long-Term Pact With Port Of Galveston

Lykes Bros. Steamship Company, Inc., has agreed to pay the Port of Galveston a minimum of nearly $500,000 over the next several years for use of Galveston's East End Container Terminal.

In related actions, the port and Lykes adjusted or merged into the new lease earlier agreements covering several barge-handling facilities on both sides of the Galveston Channel.

The entire package, approved by the port board and Lykes officials, calls for Lykes to pay a minimum sum of $488,980.50 at not less than $100,000 per year for non-preferential call at the Wharves' East End Container Terminal.

"An important aspect of this package is that port revenues from Lykes's usage is expected to exceed the minimum guarantee, and we look forward to good business for Lykes as well as the Port of Galveston," said **C.S. Devoy,** executive director.

"We have indicated to you that we will continue to maintain our operation of SEABEES (barge and container-carrying ships) through Galveston," said **R.E. Berkefeld,** vice president, West Gulf Division for Lykes.

Mine Safety Appliances Offers New Bulletin On Gas Detection

A new bulletin describing continuous combustible gas detection systems is available from Mine Safety Appliances Company, Pittsburgh, Pa.

Designed to indicate and warn of volatile vapors and gases before they reach the danger point, the Series 500 gas detection systems will detect the lower explosive limit of any gas or vapor whose molecular weight and explosive range are known.

The gas monitoring instruments are intended for use in detecting vapors from gasoline, LPG, natural gas, sewer gas, methane, hydrogen and other vapors. Monitoring may be accomplished at single or multiple locations at distances up to 5,000 feet from the vapor source.

The eight-page bulletin explains general characteristics, features and options, and technical data on the Series 500 line of gas detection systems.

For more complete and detailed information on Series 500 Combustible Gas Detection Systems, request Bulletin No. 0703-25 from Mine Safety Appliances Company, Pittsburgh, Pa. 15235.

New Hull Coating Introduced In U.S. By Hempel Marine Paints

A new marine coating that is water absorbent when applied to a ship's bottom to a thickness of under ½ mil was recently introduced to the American maritime industry at a press briefing held by Hempel's Marine Paints, Inc. in the St. Regis Hotel in New York City. Called the Hydron Dynamic System, it is comprised of an antifouling dynamic coating manufactured by Hempel's and a topcoat of Hydron Dynamic manufactured by National Patent Development Corporation. National Patent licenses Bausch & Lomb to manufacture and sell soft contact lenses. National Patent's Hydron® is a hydrophilic acrylic polymer nonsoluble in water. It is used for nonfogging motorcycle shields, ski and safety goggles, protective building coatings, fishing lures, etc., and has many applications in the medical and dental fields.

The Hydron® Dynamic takes up water, and hull friction is reduced by the water "lubricant" provided by the new material. The manufacturers claim the new system increases the efficiency and life of the antifouling coating, increases ship's speed thereby saving fuel costs, and also prolongs the intervals between drydockings.

Both new products, the antifouling coating and the topcoat, will be marketed by Hempel's Marine Paints, Inc., with sister companies throughout the world and corporate headquarters in Denmark.

Liquid Carbonic Brochure Describes Automatic Pipe Welding

An automatic programmed pipe welding system is described in a new brochure offered by Liquid Carbonic.

The DynaSurge APW-3D Welding Machine is an integrated automatic system used to weld pipe, tube joints and Omega seals in any position with the pipe, tube or seal fixed at one of both ends. This is accomplished with a pulsed-arc gas tungsten-arc (TIG) torch mounted on a precision made motor-driven carriage clamped to part of the member to be welded.

The carriage travels in a 360-degree arc around the joint and fuses one of the following: (1) a preplaced consumable insert in single pass welds; (2) consumable inserts, plus cold wire filler metal deposits in multiple pass welds of thick wall pipe; or (3) cold wire filler metal deposits in seal welds.

The system can be used to weld titanium, stainless steel, iconel, copper-nickel, monel, carbon steel, and other bimetallic combinations. A standard control console allows programming for repetitive welding in any position, and skilled welders are not required to operate the equipment.

Performance specifications, a comparison of the APW-3D to manual operations, and complete component equipment are all described in the brochure. For a copy, write Liquid Carbonic Corporation, subsidiary of Houston Natural Gas Corporation, 135 South LaSalle Street, Chicago, Ill. 60603, attention: **H.D. Erzinger Jr.** Ask for Form #624OR.

PORT ENGINEERS HONOR DONAHUE: Philip Donahue, assistant vice president of Maritime Overseas Corporation and past president of The Society Of Marine Port Engineers New York, N.Y., Inc., is shown above receiving a plaque honoring him during the 22nd Annual Fort Schuyler Forum held recently. **Joseph Thelgie,** president of the Society, made the presentation in recognition of Mr. **Donahue's** outstanding contributions to the Port Engineers during his term as president, 1972-73. Mr. **Donahue** is a graduate of Kings Point, class of 1944, and is an active member of The Society of Naval Architects and Marine Engineers.

Capt. van Lier Named President Mooremack Bulk Transport

Capt. J.A.A. van Lier

James R. Barker, chairman and chief executive officer of Moore McCormack Resources, Inc., One Landmark Square, Stamford, Conn. 06901, has announced that Capt. **J.A.A. van Lier** has been named president of Moore-McCormack Bulk Transport, Inc., a subsidiary.

In making the announcement, Mr. **Barker** said: "Captain **van Lier's** extensive experience in the marine transportation industry and his broad knowledge of tanker operations around the world will be of substantial benefit to Moore-McCormack Bulk Transport, which will operate oil tankers now under construction, and other bulk carriers."

Captain **van Lier,** a native of Holland, has been with the Royal Dutch/Shell Group of companies for 35 years, most recently as marine manager for its Asiatic Petroleum Corporation, New York, a position he held for about six years. Prior to that, he served in various executive capacities for other Shell companies in London, Singapore, New Guinea, Australia, the Philippines and Rotterdam..

Captain **van Lier** was educated at the Nautical College in Holland, where he also did some postgraduate work. In addition, he has participated in several career training courses in labor relations, management, finance and economics.

Moore McCormack Resources, Inc. is a transportation and natural resources organization. Its principal subsidiaries include Pickands Mather & Co., which operates iron ore and coal mines, Great Lakes ore carriers, and acts as sales agent for various materials; and Moore-McCormack Lines, Incorporated, which offers ocean shipping services from U.S. East Coast ports to the east coast of South America and to South and East Africa.

SNAME New England Section Hears Controllable Pitch Propeller Paper

Pictured at the meeting of the New England Section, left to right: **Richard Roberts,** chairman of the Section; **Monroe Macpherson,** chairman of the SNAME Committee on Sections; **Robert Mende,** national secretary of SNAME; **F.L. Narbut,** author; **Phillip Eisenberg,** national president of SNAME; **Howard Scott,** president of the Bird-Johnson Company, and **Donald Ridley,** vice president of the Bird-Johnson Company.

A group of members and guests of the New England Section of The Society of Naval Architects and Marine Engineers gathered on March 8 to hear **Frank Narbut,** marine sales manager for the Bird-Johnson Company, present a paper entitled "Factors Affecting the Selection of a Controllable Pitch Propeller." The social hour, dinner, and technical session followed a tour of the new facilities of the Bird-Johnson Company in Walpole, Mass. Among those in attendance were **Phillip Eisenberg,** national president of the Society, and **Robert Mende,** national secretary.

The author was introduced by **Donald Ridley,** vice president of the Bird-Johnson Company. In his presentation, Mr. **Narbut** cited performance under off-design conditions, use of machinery with unidirectional rotation, and maneuvering ability as factors to be considered in the selection of a controllable pitch propeller. He discussed each factor in detail, and called attention to the figures in the paper which contained supporting statistics. In the discussion which followed, there were questions and comments regarding docking hull damage, the use of controllable pitch propellers on large tankers, and maneuvering simulation.

Copies of the paper are available at a cost of $2 each by writing to: **Robert Baseler,** Editor, SNAME New England Section, General Dynamics, Quincy, Mass. 02169.

Gotaverken To Build Two Bulk Carriers For Wilh. Wilhelmsen

Gotaverken has received an order from Wilh. Wilhelmsen, Oslo, Norway, for two 121,350-dwt bulk carriers to be built at the Oresund yard. Both vessels are due for delivery in 1977.

The approximate measurements of the bulk carriers are: length overall, 878 feet; length bp, 850 feet; breadth, molded, 128 feet; depth, molded, 72 feet, and draft on summer freeboard, 52 feet.

Including these two new vessels, 50 ships have been ordered at Gotaverken in the last 18 months, with a total value of 7,000 million Swedish kronor.

The two bulk carriers will be the first to be built by Gotaverken for Wilh. Wilhelmsen since 1949, when two 7,620-dwt dry cargoships were delivered to that owner.

American Bureau Of Shipping Reports Increase In Activity During 1973

During 1973, the American Bureau of Shipping classed 1,531 new vessels of 12,942,000 deadweight tons, an increase over 1972 of 8.0 percent in deadweight tons, it was announced at the annual meeting of the American Bureau of Shipping held in New York on March 19.

Under ABS classification as of December 31, 1973, there were a total of 10,221 vessels of 119,580,000 deadweight tons, reported **Robert T. Young,** ABS chairman and president.

At the first of the year, there were 2,961 vessels under contract to be built in 38 countries to the American Bureau of Shipping classification. These vessels, totaling 54,278,000 deadweight tons, represent an increase of 21.8 percent in vessels and 32.3 percent in deadweight tons over the previous year, Mr. **Young** said.

A vigorous growth in container certification was reported. During 1973, some 27,500 containers were contracted to ABS certification. Since ABS initiated this service a few years ago, approximately 105,000 containers have been built or are contracted to be built to its certification. In 1973, ABS also certified 14,800 containers of 51 designs in accordance with United States Custom Requirements for containers under the TIR convention. At the close of 1973, ABS had classed 13 LASH ships and three SEABEE ships, and had requests for the classification for seven additional LASH vessels. And during 1973, ABS classed 475 LASH barges, bringing the number classed to 1,875.

In his message, the ABS chairman noted that the construction of offshore mobile drilling units continues at a strong pace and that the American Bureau of Shipping is maintaining its position of prominence in this field. As of December 31, 1973, one hundred and eight offshore mobile drilling units had been classed by ABS and 59 mobile drilling units contracted to ABS classification, with an additional 17 proposed units in the process of being reviewed by the technical staff.

Mr. **Young** highlighted the involvement of the American Bureau of Shipping with the development of energy carrying vessels, citing that on January 1 of this year, there were 254 tankers totaling 42,247,000 deadweight tons under contract to be built to ABS classification, and that five LNG carriers were on order in France to ABS classification and 15 LNG carriers were contracted or to be contracted to ABS classification in the United States.

"Among the most challenging Research and Development projects in progress," Mr. **Young** stated, "is the development of a computer program for generating scantlings and hull girder section modulus for oil, ore, and bulk carriers in accordance with our 'Rule' requirements. For this project, numerous data from our published 'Rules' were programmed for users of the software, namely our surveyors in the technical offices of ABS. This computer program will be accessible to these surveyors in our worldwide network of technical offices by telephone-teletype terminals. With such accessibility at London, Tokyo, or New York, for example, a more rapid plan approval service can be provided."

In 1973, the American Bureau of Shipping investigated the stiffness of the thrust bearing and reduction gear foundations on high-speed vessels. This study incorporated both the ABS DAISY finite element analytical system of computer programs and hull girder vibration computer programs in conjunction with shipboard measurements. These studies confirmed the reliability of the computational techniques used by ABS and advanced the capability of ABS to calculate, in the early design stages, both the vibratory characteristics and the relative deflections of a propulsion unit and its foundations. In related work, ABS used its developed computer programs to conduct analyses of shafting alignment and whirling and torsional vibrations on various propulsion systems.

Mr. **Young** reported a steady growth in the activity of ABS Worldwide Technical Services, Inc. By the end of 1973, ABSTECH was engaged in 710 assignments, over seven times the number of the prior year, and ABSTECH had expanded its services in the petroleum industry, including design, review, test, and inspection of specialized equipment used in association with offshore mobile drilling units, pumping stations, undersea and overland pipelines, and sea terminals.

Economics Of LNG Ship Reliquefaction Systems Discussed At SNAME N.Y. Metropolitan Section

Pictured above during the March meeting, left to right: **Donald B. Carpenter,** chairman, N.Y. Metropolitan Section; **V.J. Lane,** author; **Richard Herold,** president, Sulzer Bros., Inc.; **Patricia M. McGovern,** Section executive committee; **Thomas J. Sartor Jr.,** vice chairman of the Section, and **Walter M. Maclean,** executive committee.

The New York Metropolitan Section of The Society of Naval Architects and Marine Engineers met on March 13, 1974, at the New York Times Building in New York City.

After a social hour and buffet in the Executive Dining Room, the technical session was held in the WQXR Auditorium. The title of the paper presented was "The Economics of Marine Reliquefaction Systems for LNG Ships," by **V.J. Lane,** Sulzer Bros., Inc.

LNG carriage in ships involves disposal of boil-off vapor from the cargo tanks. The accepted method has been to utilize this boil-off as part of propulsion fuel. Recovery of these vapors has been considered from time to time, but low product value and high capitalization cost for necessary reliquefaction systems has made on board reliquefaction unattractive; recovery system complexity further inhibited efforts.

This paper reviews factors of importance to decisions regarding installation of reliquefaction plants on board LNG vessels and determines conditions under which such installations provide an economically attractive alternative to burning of boil-off.

Carson To Head Int'l Parts Marketing For Cummins Engine Co.

Kyran W. Carson

Kyran W. Carson has been named international parts marketing director by the Cummins Engine Co., Inc., Columbus, Ind. In his new capacity, Mr. **Carson** will be responsible for parts sales in all international markets.

Mr. **Carson** joined Cummins in 1966 after three years of service as an officer in the U.S. Navy. He has served in several marketing positions, both domestic and international, most recently as manager-distributor parts operations.

Mr. **Carson** holds a B.S. degree from St. Lawrence University, and makes his home in Columbus.

ETA Offshore Seminar To Be Held In Houston April 29 Thru May 3

ETA Offshore Seminars, Inc. (ETAOS), the Houston-based training company sponsoring offshore seminars on an international scale, will present its eighth seminar session on April 29-May 3, 1974, in Houston, Texas, the week before the Offshore Technology Conference in Houston. Through the seminar sessions, ETAOS continues to update experienced personnel and train new men for offshore service. The seminars zero in on the latest technology in offshore drilling, completion, and production.

ETAOS was formed to fill an educational need of the offshore industry as it is faced with an acute shortage of trained and qualified personnel to man the increasing number of costly offshore drilling and production units. The ETA Offshore Seminars provide a unique service for the industry and feature up to 30 speakers for one session.

The seminar speakers represent vital segments of the offshore industry. They are leading experts in their fields, involved in the daily problems, as well as the future of the offshore industry. The speakers and topics are carefully screened and selected so that the presentations cover a broad spectrum of the industry.

The seminars cover the theory, selection, and operation of offshore drilling, subsea completion, and production equipment. The presentations range from an introduction to basic oceaneering to detailed techniques for drilling and producing in deeper and more hostile waters. The seminars focus on offshore safety, drilling unit stability, certification, marine insurance, well testing, blowouts, and diving operations. For equipment and techniques, the speakers cover mooring systems, dynamic positioning, blowout preventers, marine risers, drilling motion compensation, offshore drill string, and tensioning systems.

The seminars have attracted participants from every phase of the industry and from countries such as Norway, Sweden, the British Isles, Canada, South America, and the United States. Representatives from over 30 oil companies, drilling contractors and operators, vessel designers and builders, product/service suppliers, engineering firms, and pipeline companies have attended the seminars. The participants receive through the seminar sessions first-hand knowledge of the industry that would otherwise take months or years of exposure to obtain.

ETAOS is additionally presenting an Offshore Economics Seminar in conjunction with a management consulting firm. The seminar on "Problems, Profits, Opportunities in the Offshore Industry" will be held in Houston on May 9, 1974; in Los Angeles, Calif., on May 21, 1974, and in New York, N.Y., on May 23, 1974.

For further information on the seminars, contact **John Ralston,** Vice President of Operations, ETA Offshore Seminars, Inc., 4140 Southwest Freeway, Houston, Texas 77027.

Offshore Drilling On The Chinese Continental Shelf To Be Discussed At OTC

Prospective development of petroleum resources off the coast of the People's Republic of China and its subsequent impact on Western petroleum activities will be discussed in a technical session on "Offshore Industry Technology" at the Sixth Annual Offshore Technology Conference, May 6-8, 1974, at the Astrohall in Houston, Texas.

A model of the Chinese offshore situation presently being developed at the Massachusetts Institute of Technology will be described at the session by **J.O. Willums,** with the department of ocean engineering at M.I.T. The purpose of the model is to determine the impact of future oil and gas discoveries on the Chinese and the world energy situation, and to establish the size of the market for Western equipment and services.

In his paper "Prospects for Offshore Oil and Gas Developments in the People's Republic of China," Mr. **Willums** will provide a background on the current issues by tracing the development of Chinese petroleum technology from the drilling for natural gas during the Han dynasty (second century B.C.) to China's recent planning for a pipeline project to connect the first offshore fields in the Gulf of Chihili. The social, economic, and political climate will also be analyzed to provide a comprehensive look at the latest trends in China's policy toward Western technology.

Other papers scheduled to be presented during the Offshore Industry Technology session include: "Open Sea Mariculture: Perspectives, Problems, and Promise," by **Joe A. Hanson,** with the Oceanic Institute in Waimanalo, Hawaii; "Offshore Oil and Sea Floor Research," by **T.F. Gaskell,** with Onshore Investments Ltd. in London; "Safety Characteristics of Lockheed's Subsea Production System," by **G.H. Fahlman,** with Lockheed Petroleum Services Ltd. in British Columbia, Canada; and "International Inventory and Forecast of Ocean Offshore Drilling Rigs, Surface Vessels, and Certain Undersea Apparatus Owned by United States Petroleum and Mining Companies and Foreign Subsidiaries, Year-End 1972 to Year 1985," by **Alan Lohse,** with Gulf Universities Research Consortium in Houston, and **Joseph R. Crump,** with the University of Houston.

The Offshore Technology Conference is an international technical meeting and exhibition devoted to the development of the world's offshore resources.

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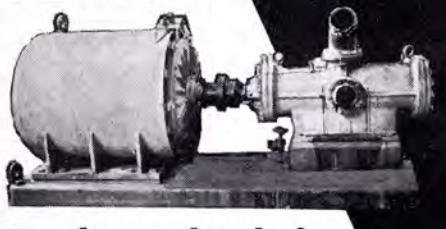

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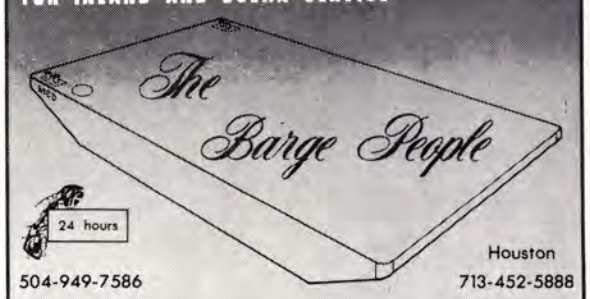

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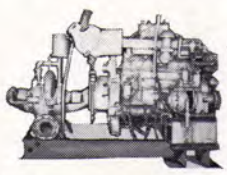

2—BUDA, Model 6-LD-468, Diesel Engines, 6 cylinders, 100 BHP, Marine, Gardner-Denver centrifugal Pumps, Bronze, horizontally split case, 1000 GPM, 280′ head, 6″ suction and 5″ discharge.

DC, VERTICAL-ROTARY

1—WORTHINGTON, Size 4GRVS, with Westinghouse Motor, 15 HP, 230 Volts DC, 1310/1750 RPM.

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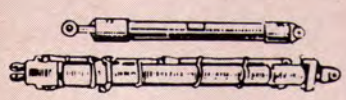

Bore	Overall Stroke	Rod Diameter	Retracted Length	Action
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2″	8″	1½″	20″	double
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DC, VERTICAL - ROTARY cont.

2—QUIMBY, Size 5, 6x5, 400 GPM, 48 PSI, 25 HP, 230 DC.

2—WORTHINGTON, Type 3GRVS, 90 GPM, 75 PSI, 7½ HP, 230 DC.

DC, HORIZONTAL-CENTRIFUGAL

1—WORTHINGTON, Size 3UB1, 400 GPM, 280′ head, with Westingtouse Motor, 50 HP, 230 DC.

2—WORTHINGTON, Size 8L1, 2100 GPM, 138.5 TDM, with Westinghouse Motors, 100 HP, 230 DC.

3—GOULDS, 250 GPM, 100 PSI, Figure 3380, 4″x3″, with 30 HP Motors, 230 DC.

4—WORTHINGTON, Size 12LA1, 4000 GPM, 67.3 TDM, 100 HP, 230 DC.

AC, HORIZONTAL-CENTRIFUGAL

1—WARREN, 600 GPM, 50 PSI, 8¼ HP, 440/3/60, 1135 RPM.

4—WORTHINGTON, 200 GPM, 100 PSI, 3½″ suction, 3″ discharge, Size 2UB1, with Wagner Motor, 25 HP, 440/3/60.

1—GARDNER-DENVER, 5″ suction, 3″ discharge, 350 GPM, 336′ head, 50 HP, 440/3/60, 3500 RPM.

1—CARVER, 400 GPM, 100 PSI, 3½″ suction, 2½″ discharge, 3500 RPM, 35.7 HP, 440/3/60.

2—BUFFALO, 250 GPM, 100 PSI, Class CCS, Size 4x3½″, with Westinghouse Motors, 25 HP, 440/3/60.

DC, VERTICAL-CENTRIFUGAL

2—ALLIS-CHALMERS, 170 GPM, 208′ head, Type CF2V, 6″ suction, 3½″ discharge, 20 HP, 230 DC.

2—ALLIS-CHALMERS, 30 GPM, 208′ head, Type CF2V, 2½″ suction, 1½″ discharge, 7½ HP, 230 DC.

1—ALLIS-CHALMERS, 400 GPM, 100 PSI, 4″x3″, 50 HP, 230 DC.

1—WORTHINGTON FIRE & BUTTERWORTH, Size 3 UBS, 400 GPM, 200 PSI, 75 HP, 230 DC.

2—ALLIS-CHALMERS, Type SGV, 600 GPM, 30 PSI, 20 HP, 230 DC.

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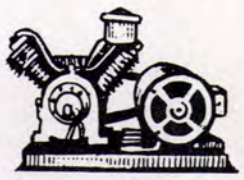

2—SULLIVAN, Size WL60, Model A-UB-8, 100 PSI, 2 stage, with 30 HP G.E. Motors. 440/3/60.

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

3—INGERSOLL-RAND, Size 5x5x4x4, 50 CFM, 150 PSI, with G.E. Motor, 20 HP, 440/3/60.

2—WESTINGHOUSE Air Brake Steam, Size 11x11x12, approximately 60 CFM at 100 PSI.

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

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

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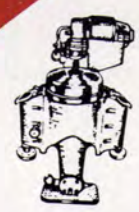

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BUDA, 6 DHG691, 60 KW, 120 DC.

GENERAL MOTORS, 6067, 60 KW, 450/3/60.

BUDA, 6DC844, 75 KW, 125-250 DC.

1—CUMMINS, Model HCD, 60 KW, 120/240 DC.

CATERPILLAR, D17000, 85 KW, 220/3/60.

4—COOPER-BESSEMER, Model FSN6, 6 cylinders, 375 HP, 900 RPM, with General Electric Generators, 250 KW, 440/3/60.

MORE DIESEL GENERATORS ON FOLLOWING PAGE

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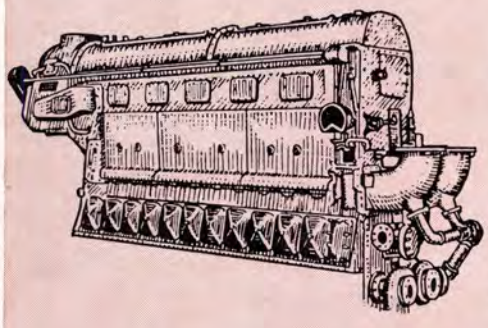

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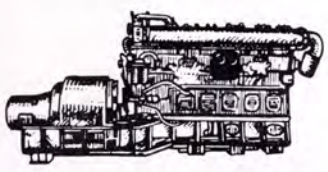
Model 38D8⅛ —1 port; 1 Starboard. Used condition, 1800 HP, 800 RPM, 2 cycle, 8½" bore, 10" stroke, Air Start. Complete with Westinghouse Reduction Gears, 2.216:1 ratio—with Hydraulic Coupling.

3—COOPER-BESSEMER DIESEL ENGINES, Model LS-8-DR, 1300 HP, 277 RPM, direct reversing, turbo charged.

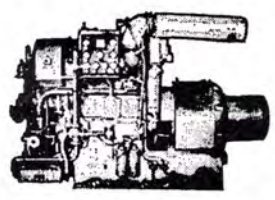
2—SUPERIOR DIESEL ENGINES, Model VDSS, 1160 HP, 325 RPM.

MARINE DIESEL GENERATORS



3—DE LAVERGNE, Marine, 560 HP, 514 RPM, Serials #2180 and #2181, with Electric Machinery Generators, 375 KW, 450/3/60.

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



1—GENERAL MOTORS, Model 3-268A, Marine, 150 BHP, 1200 RPM, 3 cylinders, with 100 KW Generator. 120/240 DC.

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

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A.C.

2—1500 KW, GENERAL ELECTRIC Turbines: Type FN4-FN30, Steam 525 PSIG. 8145 RPM, with G.E. Generators, 1500 KW, 450/3/60.

4—1250 KW, GENERAL ELECTRIC Turbines: Type FSN, 525 PSI, 7938 RPM. Generators: 1250 KW, 450/3/60, 3600 RPM, Type ABT2.

7 — 750 KW, GENERAL ELECTRIC Turbines: Type FN3-FN24, 525 PSI, 10,033 RPM. Generators: 750 KW, 450/3/60, 1200 RPM, Type ATI.

2—500 KW, GENERAL ELECTRIC Turbines: Type FN3-FN20, steam 375/425 PSI, 6 Stage, 9987 RPM. Generators: 500 KW, 450/3/60, 1200 RPM, Type ATI.

D.C.

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

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

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

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

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

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

JOSHUA HENDY, 300 PSI, 550°F, with Westinghouse Generator, 300 KW, 120/240 DC.

WORTHINGTON, Form S4, 440 PSI, 740°F to a Westinghouse Generator, 250 KW, 440/3/60, and to a 90 KW, 120 DC.

DELAVAL, 450 PSI, 750°F, 300 KW, 120/240 DC.

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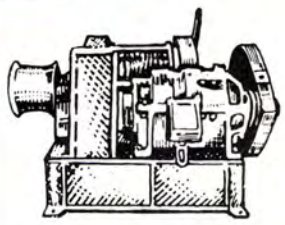

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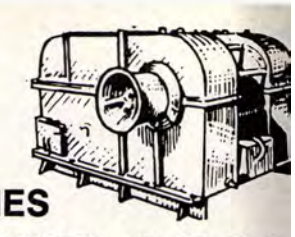
Unit Winches complete with Contactor Panels, Resistors, Master Switches.



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

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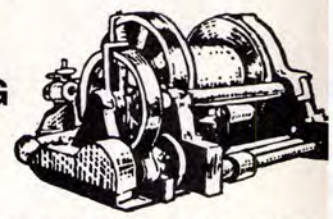

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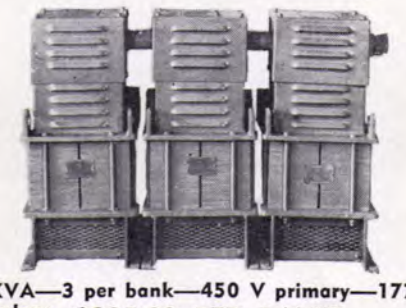

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WITH CERTIFICATES

Anchors (1500)
Chain Cables (3000 t)
Winches (150)
Windlasses (50)
Accommodation Ladders (20)
(60) **Generators**
(250) **Pumps**
(20) **Lifeboats**
(10) **Gangways**
Spare Parts

PROMPT DELIVERY ALL PORTS
ASK FOR OUR STOCKLIST

WILLEM POT B.V.

45 Stationsplein—Rotterdam
HOLLAND
TELEX: 22496
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WINCHES—Steam or Air Operated

4x6 Lidgerwood, 13000# Static Load $995.00 each
8x8 Lidgerwood, 6,000# at 200 FPM $1500.00 each
7x12 American Hoist & Derrick 10,000# at 125 FPM $1500.00 each
9x12 American Hoist & Derrick 20,000# at 110 FPM $2750.00 each
10½x12 Lidgerwood, 32,000# at 90 FPM $4750.00 each

Also Electric

2 Almon A. Johnson Towing Engines Model 232 wire rope included at $19,000.00 each

All sizes of stud link chain, anchors, fittings available from stock

STANDARD STEAM WINCH CO., INC.
Agents for Baldt Anchor & Chain and Crosby Group
16 Beaver St., N.Y., N.Y. 10004 212/269-1557

NEW 7" RADIUS PANAMA CHOCKS

(MEET PANAMA REGULATIONS)

With extended legs for welding to deck. IMMEDIATE DELIVERY FROM STOCK.

THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202

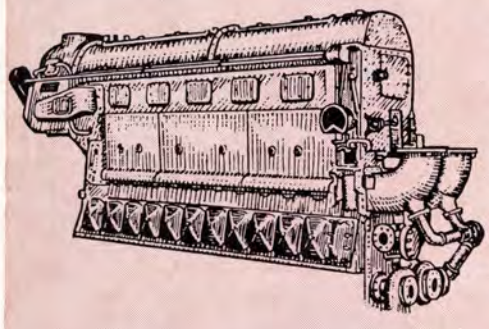
NEW WATERTIGHT DOORS

6-Dog right and left hand hinged steel doors—with frames.

G.M. 8-268A
200 KW A.C.

NEW — UNUSED ROTARY DISPLACEMENT DELAVAL IMO 8"

MARINE DIESEL ENGINES



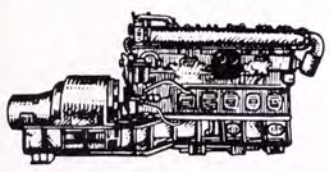
MATCHED PAIR . . . FAIRBANKS MORSE

Model 38D8⅛ — 1 port; 1 Starboard. Used condition, 1800 HP, 800 RPM, 2 cycle, 8½" bore, 10" stroke, Air Start. Complete with Westinghouse Reduction Gears, 2.216:1 ratio—with Hydraulic Coupling.

3—COOPER-BESSEMER DIESEL ENGINES, Model LS-8-DR, 1300 HP, 277 RPM, direct reversing, turbo charged.

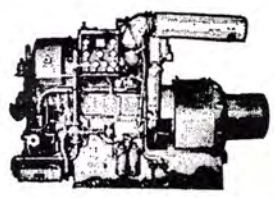
2—SUPERIOR DIESEL ENGINES, Model VDSS, 1160 HP, 325 RPM.

MARINE DIESEL GENERATORS



3—DE LAVERGNE, Marine, 560 HP, 514 RPM, Serials #2180 and #2181, with Electric Machinery Generators, 375 KW, 450/3/60.

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



1—GENERAL MOTORS, Model 3-268A, Marine, 150 BHP, 1200 RPM, 3 cylinders, with 100 KW Generator. 120/240 DC.

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

TURBINE GENERATORS

A.C. AND D.C. VOLTAGES

A.C.

2—1500 KW, GENERAL ELECTRIC Turbines: Type FN4-FN30, Steam 525 PSIG. 8145 RPM, with G.E. Generators, 1500 KW, 450/3/60.

4—1250 KW, GENERAL ELECTRIC Turbines: Type FSN, 525 PSI, 7938 RPM. Generators: 1250 KW, 450/3/60, 3600 RPM, Type ABT2.

7 — 750 KW, GENERAL ELECTRIC Turbines: Type FN3-FN24, 525 PSI, 10,033 RPM. Generators: 750 KW, 450/3/60, 1200 RPM, Type ATI.

2—500 KW, GENERAL ELECTRIC Turbines: Type FN3-FN20, steam 375/425 PSI, 6 Stage, 9987 RPM. Generators: 500 KW, 450/3/60, 1200 RPM, Type ATI.

D.C.

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

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

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

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

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

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

JOSHUA HENDY, 300 PSI, 550°F, with Westinghouse Generator, 300 KW, 120/240 DC.

WORTHINGTON, Form S4, 440 PSI, 740°F to a Westinghouse Generator, 250 KW, 440/3/60, and to a 90 KW, 120 DC.

DELAVAL, 450 PSI, 750°F, 300 KW, 120/240 DC.

SUBMARINE DIESEL GENERATOR ENGINES

(Without Generators)

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

1—FAIRBANKS-MORSE, Model 38D8-1/8, 16 cylinder, O.P., 1600 HP, 720 RPM.

☆

FOR ELECTRICAL EQUIPMENT 503/228-8691 ASK FOR "ELECTRICAL DIV."

FOR MARINE VALVES & FITTINGS: 503/228-8691 ASK FOR "VALVE DIV."

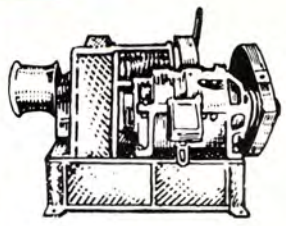
Steel Watertight DOORS

Used, Good Condition, Trimmed Frames.

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

26"x48"—4 Dogs—**$60.00** ea.
26"x57"—6 Dogs—**$80.00** ea.
26"x60"—4 Dogs, 6 Dogs—**$86.00** ea.
26"x66"—6 Dogs, 8 Dogs—**$100.00** ea.
26"x66"—Q.A. Type **$175.00** ea.

CARGO WINCHES



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

Single Speed, Single Drum

UNIT WINCHES

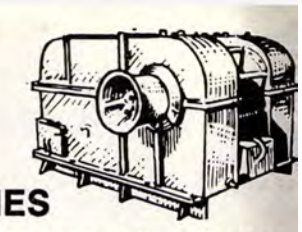
American Hoist and Derrick Co.

U3H—SINGLE DRUM, Single speed (4)
Line Pull: 7450#—223 FPM,
6360#—237 FPM,
3720#—287 FPM.

U6H—DOUBLE DRUM, Single Speed (2)
Line Pull: 7450#—223 FPM,
6360#—237 FPM,
3720#—287 FPM.

Motor: Westinghouse, 50 HP, 230 Volts DC, 1900 RPM, Model 288212, 183 Amperes, compound wound, Frame 9 UW, horizontal.

Unit Winches complete with Contactor Panels, Resistors, Master Switches.



UNIWINCHES

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

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

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

ANCHOR WINDLASSES

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

AMERICAN ENGINEERING, horizontal, double 2⅛" Chain, 65 HP, 230 DC, complete.

2—AMERICAN HOIST AND DERRICK COMPANY, horizontal, double wildcat for 2¼" chain, double gypsy, 70 HP, 230 Volts DC, with electric controls.

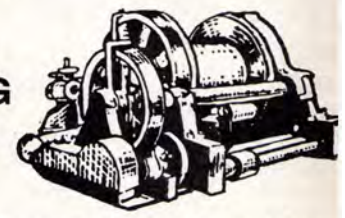
2—HESSE-ERSTED, horizontal, double wildcat, 2⅛" chain, 60 HP, 230 DC.

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

ANCHOR WINCHES

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

STEAM TOWING WINCH



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

ANCHOR CHAINS

Used — good

1⅛" size
1⅜" size
1½" size
2 1/16" size
2¼" size
2⅝" size
3⅜" size

CAPSTAN WINDLASSES

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

2—HESSE-ERSTED VERTICAL, Single Wildcat—for 1⅜" Anchor Chain, single gypsy, with 35 HP General Electric Motor, 230 Volts DC, complete with Controller equipment.

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

CARGO HOISTER BLOCKS

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

$44.50 ea.

$49.50 each with pull test certificates

Hundreds of other items in stock from Carriers, Cruisers, Destroyers, Submarines, Landing Vessels, Troop Ships and Cargo Ships

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Contact: Ralph E. Ingram

ZIDELL EXPLORATIONS, INC.

3121 S.W. Moody Avenue
Portland, Oregon 97201

A/C 503, Phone 228-8691

Nicolai Joffe Corporation

MACHINERY DIVISION

TURBO-GENERATORS

GENERAL ELECTRIC

1250 KW FSN
525 psi, 7938/3600 RPM, 450/3/60

750 KW FN3-FN24
525 psi, 10033/1200 RPM, 450/3/60

600 KW FN3-FN20
525 psi, 10033/1200 RPM, 450/3/60

525 KW DORV-325
440 psi, 5645/1200 RPM

500 KW DRV-518
1050 psi, 10945/1200 RPM, 450/3/60

400 KW DORV-618
440 psi, 10059/1200 RPM, 120/240V DC

300 KW DORV-325
440 psi, w/1200 RPM AC or DC Generators

250 KW DS60-25
440 psi, 5660/1200 RPM, 240V DC

250 KW Murray
440 psi, 5660/1200 RPM, 120/240V DC

WESTINGHOUSE

1250 KW
New Turbine Rotors for 585 psi, 8050 RPM Turbine

538 KW
Turbine Parts, Reduction Gear, 440/3/60 Generator

300 KW
440 psi, 5930/1200 RPM, 120/240V DC

250 KW
440 psi, 5015/1200 RPM, 120/240V DC

250 KW
275 psi, Turbines & Gears

60 KW M-20EH
200 psi, 7283/1800 RPM, 120V DC

ALLIS-CHALMERS

600 KW (G.E. Design)
425 psi, 5645/1200 RPM 450/3/60

500 KW (G.E. Design)
425 psi, 5645/1200 RPM 450/3/60

WORTHINGTON

400 KW Form S6
440 psi, 6097 RPM w/14 x 10 Gear
Also 300 KW in HENDY, DE LAVAL, WORTHINGTON, and ALLIS-CHALMERS

MAIN PROPULSION, TURBINES & GEARS

8500 HP WESTINGHOUSE and GENERAL ELECTRIC HP and LP Turbines for C4, C3, and AP3 Vessels. **ALSO** WESTINGHOUSE 8500 HP Main Reduction Gears, Complete with Drum Stiffened Main Gear • 8000 HP ALLIS-CHALMERS/FALK Turbines and Gears in Like-New Condition as Removed from ex Naval Vessels • 6000 HP GENERAL ELECTRIC, WESTINGHOUSE, and ALLIS-CHALMERS Turbine Rotors and Components for C2 and AP2 Vessels • 6000 HP WESTINGHOUSE and GENERAL ELECTRIC T2 Rotating Fields

SAN FRANCISCO (415) 761-0993
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WANTED
250 ton Whirley Crane suitable for or already mounted on barge.

Write to:
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Maritime Reporter/Engineering News
107 East 31st Street
New York, N.Y. 10016

BARGES FOR SALE

Two 150 x 30 x 16 Steel Hopper Barges. Ideal for Bulkhead, etc.

Eastchester Towing Co., Inc.
642 City Island Ave. Bronx, N.Y. 10464
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FOR SALE

MATCHED PAIR DIESEL ENGINES FAIRBANKS-MORSE

OP-38D8⅛
1800 H.P. @ 800 RPM
Air Start with Mufflers
Heat Exchangers and Filters
No Reduction Gears
Price $7,500 each
FOB Jacksonville, Fla.

BIRDSALL INC.
Phone 305-844-0281

FOR SALE
NEW—5400 SHP MARINE PROPULSION PACKAGE

INCLUDING

2—16 Cylinder, heavy duty, turbo charged, after cooled four cycle, air started, Marine Diesel Engines, rated at 2,800 B.H.P. (continuous) at 900 R.P.M.

1—Twin Pinion Lufkin, Compound Reverse Reduction Gear, pneumatic clutches.

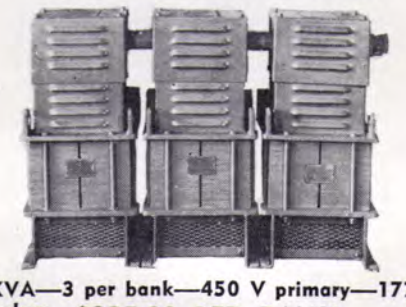
1—Engine Room Control Console — Clark-Joy including: Henschel Engine Order Telegraph System and Engines Alarm Panel.

2—Starting Air Compressors and all other attached and unattached accessories.

Auxiliaries and accessories suitable for operation on 440-3-60 current.

For additional information write:
Box 417 Maritime Reporter/Engineering News
107 East 31 Street New York, N.Y. 10016

TRANSFORMERS



15 KVA—3 per bank—450 V primary—177 volt secondary. $295.00 PER BANK

Also inquire about other sizes: 10 KVA/20 KVA/ 25 KVA/37 KVA

THE BOSTON METALS COMPANY

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

Europe's Largest Marine Stocks
FACTORY RECONDITIONED
WITH CERTIFICATES

Anchors (1500)
Chain Cables (3000 t)
Winches (150)
Windlasses (50)
Accommodation Ladders (20)
(60) **Generators**
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45 Stationsplein—Rotterdam
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TELEX: 22496
Phone: 11 98 70 Grams: "Windlass"

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4x6 Lidgerwood, 13000# Static Load $995.00 each
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7x12 American Hoist & Derrick 10,000# at 125 FPM $1500.00 each
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Agents for Baldt Anchor & Chain and Crosby Group
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(MEET PANAMA REGULATIONS)

With extended legs for welding to deck. IMMEDIATE DELIVERY FROM STOCK.

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NATIONAL METAL'S CURRENT T-2 INVENTORY

MANY OTHER ITEMS NOT LISTED • ALL ITEMS FURNISHED WITH A.B.S. OR LLOYDS'

TURBOGENERATORS

525 KW GENERAL ELECTRIC AUXILIARY TURBOGENERATOR UNIT

Complete with L.O. Cooler. **Turbine:** General Electric 525 KW, Type DORV-325M, 5645 RPM. **Reduction Gear:** General Electric Type S-162-D, 5645/1200 RPM, single helical. **Generators::** General Electric. (1) Type ABT, 3 phase, 400 KW, 450 VAC, 1200 RPM. (2) Type MPC, 75 KW, 110 VDC, 1200 RPM, Exciter. (3) Type MPLI, 55 KW, 120 VDC, 1200 RPM, Generator. (4) Auxiliary DC generators.

538 KW WESTINGHOUSE TURBOGENERATOR UNIT

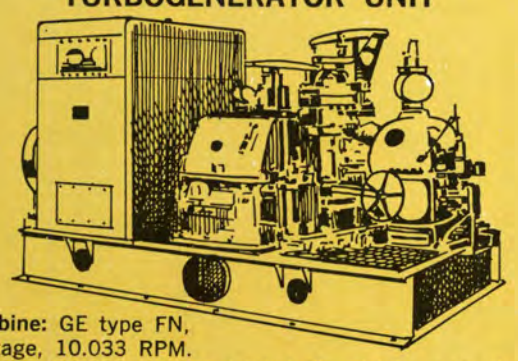
Complete with L.O. Coolers and exciters. **Turbine:** Westinghouse 538 KW, 5010 RPM. Inlet pressure 435 psi. Temp. 750 degrees F.TT. Exhaust pressure 28½ hg vac. **Generators:** (1) 400 KW, 450 VAC, 3 pole, 60 cycle, PF 80%, 1200 RPM, ship's service. (2) 32.5 KW, 125 VDC, 1200 RPM, variable voltage exciter. (3) 110 KW, 125 VDC, 1200 RPM, constant voltage generator. (4) 5 KW, 125 VDC, 1200 RPM, ship's service Generator-Exciter. **Reduction Gear:** Ratio 5010/1200 RPM.

535 KW GENERAL ELECTRIC TURBOGENERATOR UNIT

Complete with L.O. Coolers and exciters. **Turbine:** General Electric Mfg. drawing P-8453535, 3 stages, type DORV-325, 5645 RPM, rating 535 KW, inlet pressure 590 lbs., Superheat 325 degrees F., exhaust pressure 1¾ ABS. **Reduction Gear:** General Electric, type S-162-D, Class, 535 KW, Mfg. dwg, T-8453535, 5645/1250 RPM. **Generator:** General Electric, Dwg, T-8453535, type ATB-976, KNA 500, 450 volts AC, 3 phase, 60 cycle, 400 KW, 642 amps, 1200 RPM, PF .8, Frame 976, Exciter 120 volts DC. Control panel: General Electric, Dwg. 6367270, Type XF-100492, 6 circuits, 450 volts AC.

★★ ALSO AVAILABLE!! ★★

600 KW GENERAL ELECTRIC TURBOGENERATOR UNIT



Turbine: GE type FN, 6-stage, 10.033 RPM.

Reduction gear: GE triple-helix, triple reduction, 10033/1200 RPM. **Generator:** GE type ATI, 600 KW, 6-pole, 0.8 pf, 450 VAC, 3 phase, 60 cycle, 1200 RPM. **Exciter:** GE type MPLI, 7.5 KW, 120 VDC, direct connected. **Air cooler:** Surface type, for generator, complete with control panel.

MAIN MOTOR FOR T2

Gen. Elect. #5690714 Type TSM-80, 6000 HP, 90 RPM, form H.L., 2300 Volts, Amps. arm. 1160, P.F. 1.0, KVA 4625 Phase 3 cycle 60, Exciter volts 120, amps field 390 contin. @ 60°C. rise.

5400 KW MAIN GENERATOR

General Electric, S/N 79938, Marks 6937958 G-4, 5F-1690-2, 164-M.

PUMP UNITS

CARGO STRIPPING PUMP

(Steam) Worthington, vertical duplex, double acting, size 14″ x 14″ x 12″, speed 46 ft./min., 700 GPM, 150 psi operating pressure.

MAIN FEED PUMP

Pump: Coffin Turbo Pump Co., single stage, centrifugal, size CG-12A, 6980/7030 RPM, 240/280 GPM, 254/280 HP, 6″ x 3″, 750 psi @ 1760 ft. head, complete with turbine.

MAIN FEED PUMP

Coffin, turbine drive, Type F, 7200 RPM, 200 GPM, 150 HP, 150 psi w 1329 ft. head.

MAIN CIRCULATING PUMP

Pump: Ingersoll Rand, type 24 VCM, single stage, double suction centrifugal, 585 RPM, 16,500 GPM against TDH 25 ft. @ 30 psi, 26″ x 24″. **Motor:** General Electric, Model 5K633AP1, Frame N-6336-B, 585 RPM, 440 volts AC, 191 amps, 3 phase, 60 cycle, complete with controller.

MAIN CIRCULATING PUMP

Pump: Ingersoll Rand, type 24 VCM, size 24″, 585 RPM, 14,000 GPM @ 25 ft. TDH, 26″ x 24″, operating pressure 15 psi. **Motor:** Westinghouse, Model CS, Frame 876C, 125 HP, 585 RPM, 440 volts AC, 159 amps, 3 phase, 60 cycle, complete with controller.

MAIN CARGO PUMP UNIT

Pump: Ingersoll Rand, type 2 stage horizontal, size 6-GTM, 1750 RPM, 2000 GPM, 12″ x 12″, 100 psi @ 280 ft. head. With motor.

FUEL AND LUBE OIL PUMP

Pump: Quimby, size 2½ head screw, 1200/600 RPM, 15 GPM @ 325 psi disch. press. **Motor:** General Electric, Model 5KF364PP1, Frame 364, 7.5/3.75 HP, 1160/580 RPM, 440 volts AC, 10/9.7 amps, 3 phase, 60 cycle, complete with controller.

LUBE OIL SERVICE PUMP

Pump: Quimby, Type vertical rotex, size 4-B, 1150 RPM, 175 GPM @ 60 psi with 20 ft. head, 6″ x 5″. **Motor:** General Electric, Model 5KF365AJX1, Frame 365, 5 HP, 1170 RPM, 440 volts AC, 20 amps, 3 phase, 60 cycle, complete with controller.

MAIN CONDENSATE PUMP

Pump: Ingersoll Rand, size 2VHM, 1760 RPM, 180 GPM @ TDH 165 ft., 5″ x 2″, disch. press. 67 psi. **Motor:** General Electric, Model 5KF365AJN-1, Frame 365V, 20 HP, 1765 RPM, 440 volts AC, 3 phase, 60 cycle, 25.5 amps, with controller.

AIR COMPRESSORS

COMBUSTION CONTROL AIR COMPRESSOR UNIT

Compressor: Ingersoll Rand, type 30, Model 253 x 5, 20 CFM at 100 psi, 600 RPM. **Motor:** General Electric, Model 5KG254B2782, Frame 254, Type K, 440 volts, AC, 7.5 amps, 3 phase, 60 cycles, 5 HP, 1723 RPM, complete with controller and switch.

SHIP SERVICE AIR COMPRESSOR UNIT

Compressor: Ingersoll Rand, Type 30, Model 5 x 5 x 4, 545 CFM at 100 psi, 750 RPM. With motor and base.

VALVES

Gate: 10″, 12″, 14″, 16″, 20″ and 24″
Angle: 12″, 14″ and 18″ **Crossover:** 16″
High suction: 26″ **Low suction:** 26″

TURBINE ROTORS

5400 KW GENERAL ELECTRIC TURBINE ROTOR

ABS, 6275-31, AB-142-WD-8-10-44, 1701461 T8604259, 6275-31 67-KU-102032, A853BY 21 Jan. 1967.

525 KW GENERAL ELECTRIC TURBINE ROTOR

S/N 60137, ABS 71-LA-12430-624 A624 B, Reconditioned April 21, 1971.

5400 KW WESTINGHOUSE TURBINE ROTOR

ABS report 66KU11942 A853B, 6 Sept., 1966, Marks: 6275-45. AB-142 WD9-30-44, 170-1467, 8604259-1, 6275-45.

5400 KW WESTINGHOUSE MAIN TURBINE (Profile type):

5400 KW ELLIOTT TURBINE ROTOR

ABS, 67-LA9644-830, AB-JCB-3-31-67, 9013039-9230P1, 66-KU-11895, A853 1071941, AB142 WDG-4-45.

MISCELLANEOUS T-2 EQUIPMENT

MAIN AIR EJECTOR

Main air ejector, Graham Mfg. Co., type 2 stage twin, size 163B, capacity, 65 PPH of air (220 GPM cont. @ 79°F.), oper. press. 150 PPH.

MAIN CONDENSER END

Graham (waterbox).

MAIN CONDENSER END

Westinghouse (waterbox).

MAIN CONDENSER END

Westinghouse (return head).

AUXILIARY CONDENSER END

Graham (waterbox and return head), surface condenser, size 1500 sq. ft., S/N 2915, Design press Shell 15-Tubes 25, Test press Shell 30-Tubes 50.

TAIL SHAFTS

ABS 59-S1768-AB810
Reconditioned, ABS 70-LA-11901-946

RUDDER WITH STOCK (complete)

SEND NOW FOR NEW 1974 CATALOG

HUNDREDS OF OTHER ITEMS ALSO AVAILABLE!

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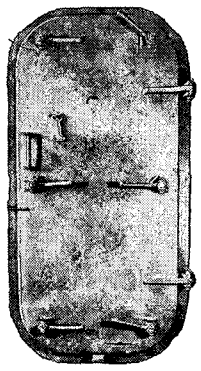
* * * * * * * * * * * * * * * * * *

NEW WATERTIGHT DOORS



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

SIZE	NET WT.
26"x48"	250 lbs.
26"x60"	300 lbs.
26"x66"	320 lbs.

EACH DOOR

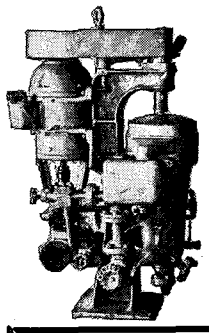
IMMEDIATE DELIVERY

THE BOSTON METALS COMPANY

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

SHARPLES OIL PURIFIERS

Complete with motor, starter and pump
FOR FUEL OR LUBE OIL



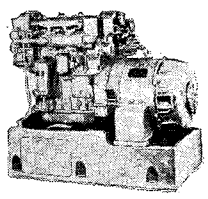
DIESEL LUBE OIL: 225 GPM —viscosity 180-220 SSU @ 130°F. DIESEL OIL: 225 GPM —viscosity 45 SSU @ 100°F. MODELS: Lube Oil M-85-34-5-23BM-44; Fuel Oil M-85-35-5-8CA-13. SPECIFICATIONS: Bowl speed 17,000 RPM—1" oil inlet & outlet. 2 HP verticle GE motor—440/3/60/3400 — complete with starter. Plans available.

$1850

THE BOSTON METALS COMPANY

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

DIESEL GENERATOR SETS



30 KW GM 3-71 DIESEL SET

GENERATOR: Delco 30 KW—120 Volts DC—250 amps—1200 RPM—Type 1-3563. ENGINE: GM 3-71—45 HP—electric starting—shock mounted. In Navy crate. New Navy rebuilt. **$4500**

20 KW GM 2-71 DIESEL SET

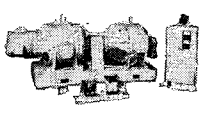
GENERATOR: Delco 1-3665—20 KW—120 volts DC—167 amps. ENGINE: GM 2-71—reconditioned—in very good condition. **$2950**

THE BOSTON METALS COMPANY

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

M.G. SETS

UNUSED—10 KW—120/1/60 M.G. SET

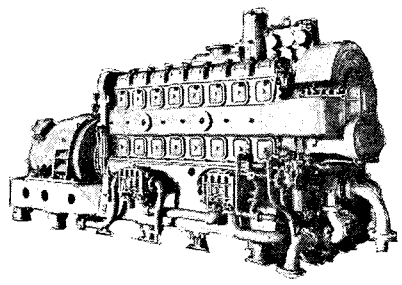


INPUT: Motor 25 HP — 120 VDC — 156 amps — 1800 RPM —flange-coupled to output generator.
OUTPUT: 10 KW generator — 120 volts 60 cycle single phase —108 amps — 0.80 PF — with direct-connected 125 volt 8 amp exciter. Motor starter by Cutler-Hammer. AC generator has voltmeter and ammeter. Bassler voltage regulator.

THE BOSTON METALS COMPANY

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

G.M. 8-268A 200 KW A.C. DIESEL GENERATOR SETS



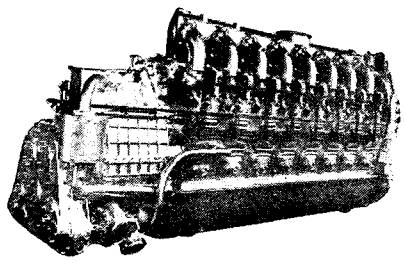
ENGINE: 8-268A—6½" bore x 7" stroke—1200 RPM—driving 200 KW Westinghouse generator—440 volts—3-phase—60 cycle—321 amps—80% power factor at 1200 RPM. Switchgear available.

$3750

THE BOSTON METALS COMPANY

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

G.M. 16-278A 1700 H.P. DIESEL ENGINES



Complete, clean and in very good condition. As removed from U.S. Naval vessels. 1700 HP @ 750 R.P.M. Your inspection invited.

THE BOSTON METALS COMPANY

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

UNUSED ALLIS-CHALMERS FIRE & GENERAL SERVICE PUMPS

200 GPM — 180' head — 2½"x2"—bronze—flange connections. MOTOR: 20 HP—115 volts DC—2400 RPM—153 amps.

THE BOSTON METALS COMPANY

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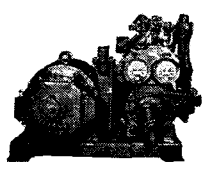
539-1900 (301) 355-5050

AIR COMPRESSORS



DIESEL STARTING

Two stage—water cooled—single acting verticle type—10 CFM—600 lbs. Type 30—Class T. Ingersoll-Rand Compressor—4x1½ x3½ @ 630 RPM. Motor 7½ HP—440/3/60 — 1750 RPM — complete with starter—intercoolers and aftercoolers.

THE BOSTON METALS COMPANY

313 E. Baltimore St. Baltimore, Md. 21202
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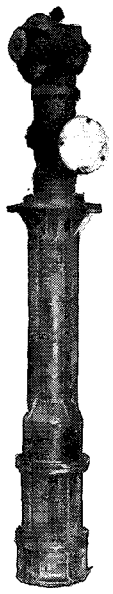


NEW — UNUSED ROTARY DISPLACEMENT DELAVAL IMO 8" DEEP WELL PUMPS suitable for oil or water 840 GPM at 50 PSI DIS. PRESS.

Pump RPM 1450. Equipped with right angle drive transmission suitable for any diesel or gas engine running at 1450 RPM. Right angle drive ratio 1:1. Suction lift flooded—50 HP required. Viscosity range SSU-130-500. These pumps are suitable and specially designed for submerged operation in oil or water. Pump case, inlet nozzle & thrust washer are bronze. Total hgt from center of drive shaft to base 9'9". Hgt from deck mounting plate to center of drive shaft 36½". From deck mounting plate to bottom suction 6'8½". Pump is self-lubricating. Suitable for oil barges & all deep well uses. Can be readily adapted for fire pump use. Further details on request.

SPECIALLY PRICED AT $3750 EACH

THE BOSTON METALS COMPANY

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

DEADFRONT GENERATOR SWITCHGEAR AVAILABLE

100, 200, 300 and 400 KW 440/3/60 units. All deadfront with voltage regulation and all from late type Navy ships.

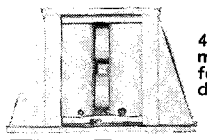
ALSO AVAILABLE

60 KW 120 volt DC Circuit Breakers—unused.

THE BOSTON METALS COMPANY

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

NEW UNUSED NAVY SURPLUS UNIVERSAL FAIRLEADS



SHIPBOARD TYPE

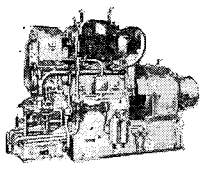
4 Rollers—8" x 18"—2 horizontal mount—2 vertical mount. OAL of fairlead 36" wide—24" high—24" deep. 28 available.

$695 Each

THE BOSTON METALS COMPANY

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

G.M. 3-268A 100 KW A.C. Diesel GENERATOR SET

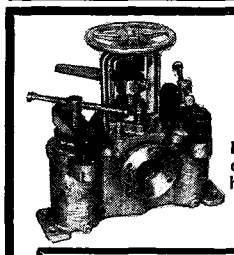


Like new, ENGINE: G.M. 3-268A—3 cylinder—6½"x7" bore & stroke. GENERATOR: Century — 100 KW—440 volts—3-phase—60 cycle. Switchgear available.

AIR STARTING $2450 ELECTRIC STARTING $2775

THE BOSTON METALS COMPANY

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



UNUSED 2" BRONZE STRAINERS (DUPLEX)

Flanged—mfg by Derbyshire Machine & Tool Co. Flange has 6 holes 9/16".

$299.00

THE BOSTON METALS COMPANY

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

BUYERS DIRECTORY

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

BEARINGS
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

BERTH FACILITIES
Pouch Terminal Inc., Edgewater Street, Staten Island, N.Y. 10305

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., N.Y. 10019

CARGO HANDLING EQUIPMENT
A. L. Hansen Mfg. Co., 2155 No. Delaney, Gurnie, Illinois 60031
MacGregor International Organization, 49 Gray's Inn Road, London W.C.I., England

CLUTCHES, GEARS & BRAKES
Eaton Corporation, Industrial Drives Div., Airflex Plant, 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., 350 Hanley Industrial Court, St. Louis, Mo. 63144
The Farboil Company, 8200 Fischer Road, Baltimore, Md. 21222
International Paint Co., Inc., 21 West Street, New York, N.Y. 10006
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.
Philadelphia Resins Corp., 20 Commerce Dr., Montgomery, Pa. 18936

CONTAINERS—CONTAINER HANDLING SYSTEMS
Ameron Corrosion Control Div., Brea, Calif. 92621
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

CONTAINER LASHINGS & COMPONENTS
American Engineered Products, P.O. Box 74 Nichol Ave., McKees Rock, Pa. 15136
Washington Chain & Supply Co., P.O. Box 3645, Seattle, Wash. 98124

CONTROL SYSTEMS
Frederick Cowan & Co., Inc., 120 Terminal Drive, Plainview, L.I. New York 11803
Henschel Corporation, 14 Cedar St., Amesbury, Mass. 01913
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.
WABCO Fluid Power Division, 1953 Mercer Road, Lexington, Kentucky 40505

CORROSION CONTROL
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 350 Hanley Industrial Court, St. Louis, Mo. 63144

CRANES—HOISTS—DERRICKS—WHIRLEYS
AB Hagglund & Soner, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Houston Systems Mfg. Co., P.O. Box 14551, Houston, Texas 77021
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501

CRANE LOAD INDICATORS
Trans-Sonics, Inc., P.O. Box 326, Lexington, Mass. 02173

DECK COVERING
Randustrial Corp., 13311 Mar Union Ave., Cleveland, Ohio 44120

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

DECK MACHINERY
AB Hagglund & Soner, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134
A. G. Weser, Seebeckwerft, 2850 Bremerhaven 1, Germany

DIESEL ENGINES
Alco Engines Division, White Industrial Power, Inc., 100 Orchard St., Auburn, N.Y. 13021
Bruce GM Diesel, Inc., 180 Route #17 S. at Interstate 80, Lodi, N.J. 07644
Colt Industries Inc., Power Systems Div., Beloit, Wisc. 53511
De Laval Turbine Inc., Engine & Compressor Div., 550 85th Ave., Oakland, Calif. 94621
Electro-Motive Division General Motors, La Grange, Illinois 60525
George Engine Co., Inc., P.O. Box 8, Harvey, La. 70038
M.A.N. Maschinenfabrik Augsburg-Nurnberg AG, Werk Augsburg, West Germany.
H.O. Penn Machinery Co., Inc., 1561 Stewart Ave., Westbury, N.Y. 11590
Waukesha Motor Co., 1000 W. St. Paul Ave., Waukesha, Wis. 53186

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

DOCK BUILDERS
GHH Sterkrade Ferrostaal Overseas Corp., 17 Battery Place, New York, N.Y. 10004

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

ELECTRICAL EQUIPMENT
AMP Special Industries, P.O. Box 1776, Paoli, Pa. 19301
Arnessen Electric Co., Inc., 335 Bond St., Brooklyn, N.Y.
ASEA Marine, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Brown and Ross of New Jersey Incorporated, 370 Paterson Plank Road, Carlstadt, N.J. 07072
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014
Thrige-Titan, Rep. in U.S.A. by Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

ELECTROPLATING
Sifco Metachemical Div/Sifco Industries, Inc., 5708 Schaaf Road, Independence, Ohio 44131

EVAPORATORS
Bethlehem Steel Corp., Shipbuilding, 25 B'way, N.Y., N.Y. 10004
Riley-Beaird, Inc., Maxim Evaporator Profit Center, P.O. Box 1115, Shreveport, Louisiana 71130

FAIRLEADS
Crosby Group, Box 3128, Tulsa, Okla. 74101

FENDERING SYSTEMS—Dock & Vessel
Hughes Bros., Inc., 17 Battery Place, New York, N.Y. 10004
Uniroyal, Inc., 1230 Avenue of the Americas, New York, N.Y. 10020

FITTINGS & HARDWARE
AMP Special Industries, P.O. Box 1776, Paoli, Pa. 19301
Esco Corporation, Wire Rope Rigging Div., 2141 N.W. 25th St., Portland, Oregon 97210
Robvon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

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

HULL CLEANING
Butterworth Systems, Inc., P.O. Box 9, Bayonne, N.J. 07002

HULL INSPECTION SYSTEMS
Hydro Products (A Dillingham Co.), P.O. Box 2528, San Diego, Calif. 92112

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

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

LIGHTS—Emergency, Search & Navigation
Phoenix Products Co., Inc., 4751 North 27th St., Milwaukee, Wisc. 53209
Snelson Oilfield Lighting Co., P.O. Box 1284, Fort Worth, Texas 76101

LNG SHIP DESIGN AND LICENSING
PDM/GAZ Transport, 919 Third Ave., New York, N.Y. 10022

LNG TANKAGE
Gazocean U.S.A. Inc., 125 High St., Boston, Mass. 02110
LGA—Liquid Gas Anlagen Union GmbH, c/o Ferrostaal Overseas Corp., 17 Battery Place, New York, N.Y. 10004
Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, Pa. 15225

LININGS
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 350 Hanley Industrial Court, St. Louis, Mo. 63144

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

MARINE DRIVES—GEARS
Philadelphia Gear Corp., Schuylkill Expressway, King of Prussia, Pa. 19406

MARINE EQUIPMENT
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014
ITT Henze Service, P.O. Box 1745, Mobile, Ala. 36610
Kearfott Marine Products, 780 South 3rd Ave., Mt. Vernon, N.Y. 10550
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186

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

MARINE INERTING SYSTEM
Smit Nymegen Corp. (Smit Ovens Nymegen), 400-1 Totten Pond Road, Waltham, Mass. 02154

MARINE INSURANCE
Adams & Porter, 1819 St. James Place, Houston, Texas 77027
Midland Insurance Co., One State St. Plaza, New York, N.Y. 10004
R.B. Jones Corp., 301 West 11th St., Kansas City, Mo. 64105
UK P&I Club (Bermuda): Thos. R. Miller & Son, Mercury House, Front St., Hamilton, Bermuda (P.O. Box 665)

MARINE PROPULSION
Combustion Engineering, Inc., Windsor, Connecticut 06095
Delaval Turbine Inc., Turbine Div., Trenton, N.J. 08602
Jacuzzi Bros., Inc., 11511 New Benton Highway, Little Rock, Ark. 72204
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171
Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Turbo Power & Marine Systems, Subsidiary of United Aircraft Corp., 1690 New Britain Ave., Farmington, Conn. 06032

MARINE SURVEYORS
McClain Marine Service, 2 Hazel Place, Hazlet, N.J. 07730
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Fla. 33316

MARITIME FINANCING—Leasing
General Electric Credit Corp., 4 Corporate Drive, White Plains, N.Y. 10604
Qualpeco Services, Inc., 750 Third Ave., New York, N.Y. 10017
Rhode Island Hospital Trust National Bank, 15 Westminster Street, Providence, R.I. 02903

NAVAL ARCHITECTS AND MARINE ENGINEERS
American Standards Testing Bureau, Inc., 40 Water Street, New York, N.Y. 10004
Amirikian Engineering Co., 1401 Wilson Blvd., Arlington, Va. 22209
J. L. Bludworth, 608 No. Clear Creek Drive, Friendswood, Texas 77546
Breit Engrg. Inc., 441 Gravier St., New Orleans, La. 70130
James G. Bronson Associates, 166 Altamont Ave., Tarrytown, N.Y. 10591
Childs Engineering Corp., Box 333, Medfield, Mass. 02052
C.D.I. Marine Co., Suite 151, 5400 Diplomat Circle, Orlando, Fla. 32810
Coast Engineering Co., 711 W. 21st St., Norfolk, Va. 23517
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, Mass. 02026
Francis B. Crocco, Inc., Box 1411, San Juan, Puerto Rico
C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048
Arthur D. Darden, Inc., 1040 International Trade Mart, New Orleans, La. 70130
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
Parker C. Emerson & Associates, 17935 Cardinal Drive, Lake Oswego, Oregon 97034
Christopher J. Foster, 14 Vanderventer Ave., Port Washington, N.Y. 11050
Friede and Goldman, Inc., 225 Baronne St., New Orleans, La. 70112
Gibbs & Cox, Inc., 40 Rector Street, 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, 10006
Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, Calif. 93017
C.T. Ilariucci & Associates, Tourism Pier #3, San Juan, P.R. 00902
Jantzen Engineering Co., 15 Charles Plaza, Baltimore, Md. 21201
James S. Krogen, 2500 S. Dixie Hwy., Miami, Fla. 33133
Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460
Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, N.Y. 11746
Marine Design Associates, P.O. Box 2674, Palm Beach, Florida
Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225
John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742
Nickum & Spaulding Associates, Inc., 71 Columbia St., Seattle, Wash. 98104
Ocean-Oil International Engrg. Corp., P.O. Box 6173, New Orleans, La. 70114
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156
S.L. Petchul, Inc., 8-D So. New River Drive East, Ft. Lauderdale, Fla. 33301
Potter & McArthur, Inc., 50 Hunt Street, Watertown, Mass. 02172
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 657 Mission St., San Francisco, Calif.
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007
Southern Engineering Associates, P.O. Box 748, Ocean Springs, Miss. 39564
T. W. Spaetgens, 156 West 8th Ave., Vancouver 10, Canada
R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wisc. 54235
Richard R. Taubler, 50 Court St., Brooklyn, N.Y. 11201
H. M. Tiedemann & Co., Inc., 74 Trinity Pl., New York, N.Y. 10006
Whitman, Requardt & Associates, 1304 St. Paul St., Baltimore, Md. 21202
Xplo Corporation, 229 Fifth St., P.O. Box 492, Gretna, La. 70053
Yankee Shipwrights, P.O. Box 35251, Minneapolis, Minn. 55435

NAVIGATION & COMMUNICATIONS EQUIPMENT
American Hydromath Co., 55 Brixton Rd., Garden City, N.Y. 11530
Communication Associates, Inc., 200 McKay Road, Huntington Station, N.Y. 11746
Edo Corporation, 13-10 111th Street, College Point, N.Y. 11356
Edo Western Corporation, 2645 South 2nd West, Salt Lake City, Utah 84115
Electro-Nav, Inc., 1201 Corbin St., Elizabeth Marine Terminal, Elizabeth, N.J. 07201
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016
ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611
Lorain Electronics Corp., 2307 Leavitt Road, Lorain, Ohio 44052
Magnavox Navigation Systems, 2829 Maricopa St., Torrance, Cal. 90503
Raytheon Marine Co., 676 Island Pond Road, Manchester, N.H. 03103
Raytheon Co., Submarine Signal Div., P.O. Box 360, Portsmouth, R.I. 02871
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.
Standard Communications Corp., 639 N. Marine Ave., Wilmington, Calif. 90744
Tracor, Inc., 6500 Tracor Lane, Austin, Texas 78721

OILS—Marine—Additives
Exxon Company, U.S.A., P.O. Box 2180, Houston, Texas 77001
Exxon International Company, 1251 Avenue of the Americas, New York, N.Y. 10020
Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002

PAINT—Marine—Protective Coatings
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 350 Hanley Industrial Court, St. Louis, Mo. 63144
International Paint Co., 21 West St., New York, N.Y. 10006
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.
Transocean Marine Paint Association, P.O. Box 456, Delftseplain 37, Rotterdam, Holland

PETROLEUM SUPPLIES
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002

PIPE—Cargo Oil
Kubota, Ltd., 22, Funade-cho 2-chome, Naniwa-Ku, Osaka, Japan

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

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

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Coolidge Propellers, 1601 Fairview Ave. East, Seattle, Wash. 98102
Escher Wyss Gmbh, P.O. Box 798, Ravensburg, Germany
Federal Propellers, 1501 Buchanan Ave. S.W., Grand Rapids, Mich. 49502

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Colt Industries, Inc., Fairbanks Morse Pump & Electric Div., 3601 Kansas Ave., Kansas City, Kansas 66110
Delaval Turbine Inc., IMO Pump Division, P.O. Box 321, Trenton, N.J. 08602
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Jacuzzi Bros., Inc., 11511 New Benton Highway, Little Rock, Arkansas 72204
Johnston Pump Company, 1775 East Allen Ave., Glendora, Calif. 91740

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REFRIGERATION
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REGENERATORS—Fuel Savings
Harrison Radiator Division, General Motors Corp., 200 Upper Mt. Road, Lockport, New York 14094

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Atlantic Cordage & Supply Corp., 60 Grant Ave., Carteret, N.J. 07008
Columbian Rope Company, 309 Genesee Street, Auburn, N.Y. 13022
Du Pont Co., Room 31H1, Wilmington, Delaware 19898
Jackson Rope Corp., 9th & Oley, Reading, Pa. 19604
Wall Rope Works, Inc., Beverly, N. J. 08010

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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.

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Western Gear Corp./Sky Climber Inc., 17311 S. Main St., Gardena, Calif. 90248

SEALS
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SHAFT REVOLUTION INDICATOR EQUIP.
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National Metal & Steel Corp., 691 New Dock St., Terminal Island, Cal. 90731
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Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006
Oaksmith Boat Sales, Inc., Fisherman's Terminal, Seattle, Wash. 98119

SHIPBUILDING STEEL
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., 25 Broadway, New York, N.Y. 10004

SHIPBUILDING—Repairs, Maintenance, Drydocking
Albina Engine & Machine Works, 2100 N. Albina Ave., Portland, Oregon 97208
Astilleros Espanoles, S.A. Zurbano, 70, Madrid 10, Spain
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150
Beliard, Crighton & Cie, P.O. Box 2074, Route des Docks, 59, Dunkirk, France
Beliard Murdoch S. A., Kattendijkdok Westkaai 21, Antwerp, Belgium
Bell Aerospace Company, Div. of Textron, P.O. Box 1, Buffalo, N.Y. 14240
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Bludworth Shipyard, Inc., Box 5426, Cypress St., Brady Island, Houston, Texas 77012
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C.M.R. (Compagnie Marseillaise de Reparations), 274 Chemin du Littoral, 13 Marseille (15E) France
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Curacao Drydock, Inc., P.O. Box 153, Willemstad, Curacao, N.A.
Dillingham Shipyard, Pier 41, P.O. Box 3288, Honolulu, Hawaii 96801
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.
Empresa Nacional Bazon, 65 Castellana, Madrid 1, Spain
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Equitable Equipment Co., Inc., P.O. Box 8001, New Orleans, La. 70122
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General Dynamics, Quincy Division, Quincy, Mass. 02169
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Havre de Grace, Havre de Grace, Md.
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Keppel Shipyard (Private) Ltd., P.O. Box 2169, Singapore
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Marathon LeTourneau Offshore Company, 1700 Marathon Building, 600 Jefferson, Houston, Texas 77002
Marathon LeTourneau Gulf Marine Division, P.O. Box 3189, Brownsville, Texas 78520
Marathon LeTourneau Marine Division, LeTourneau Rural Station, Vicksburg, Mississippi 39180
Marathon LeTourneau Offshore Pte., Ltd., P.O. Box 83, Taman Jurong Post Office, Singapore 22, Singapore
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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
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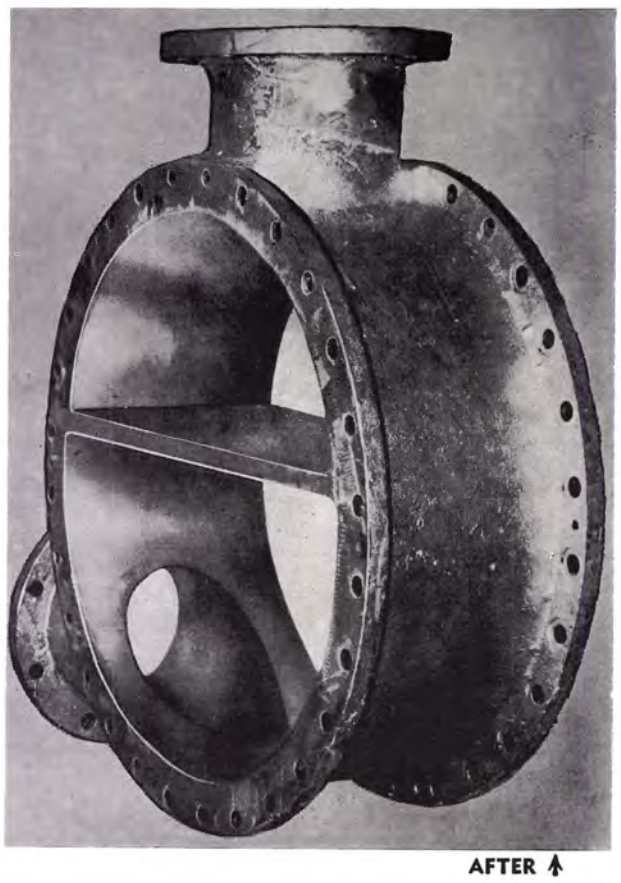

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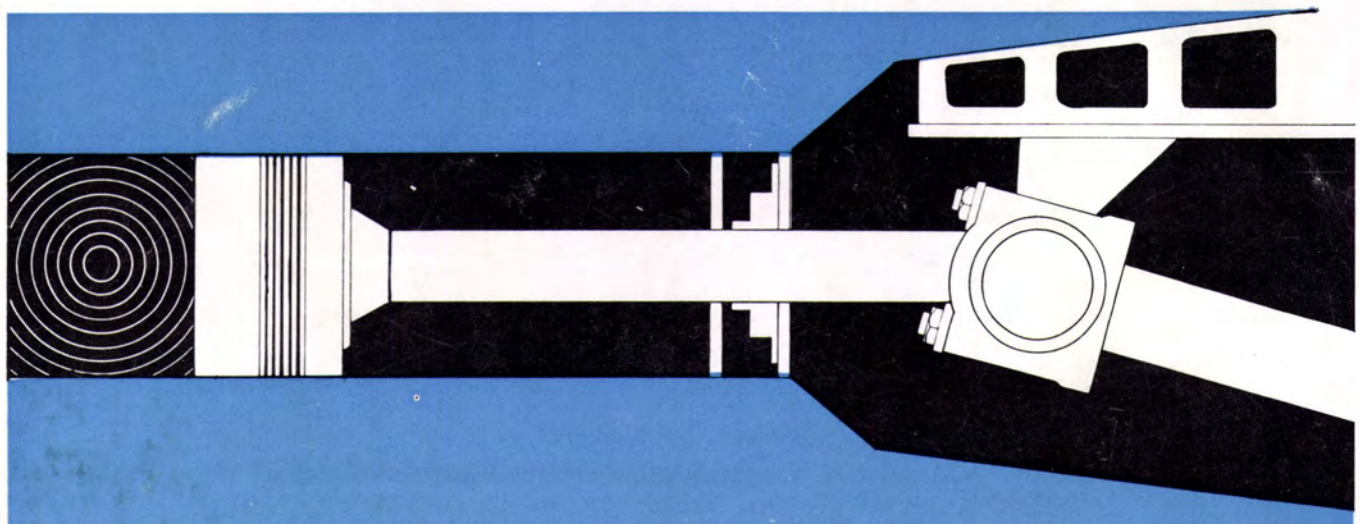

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