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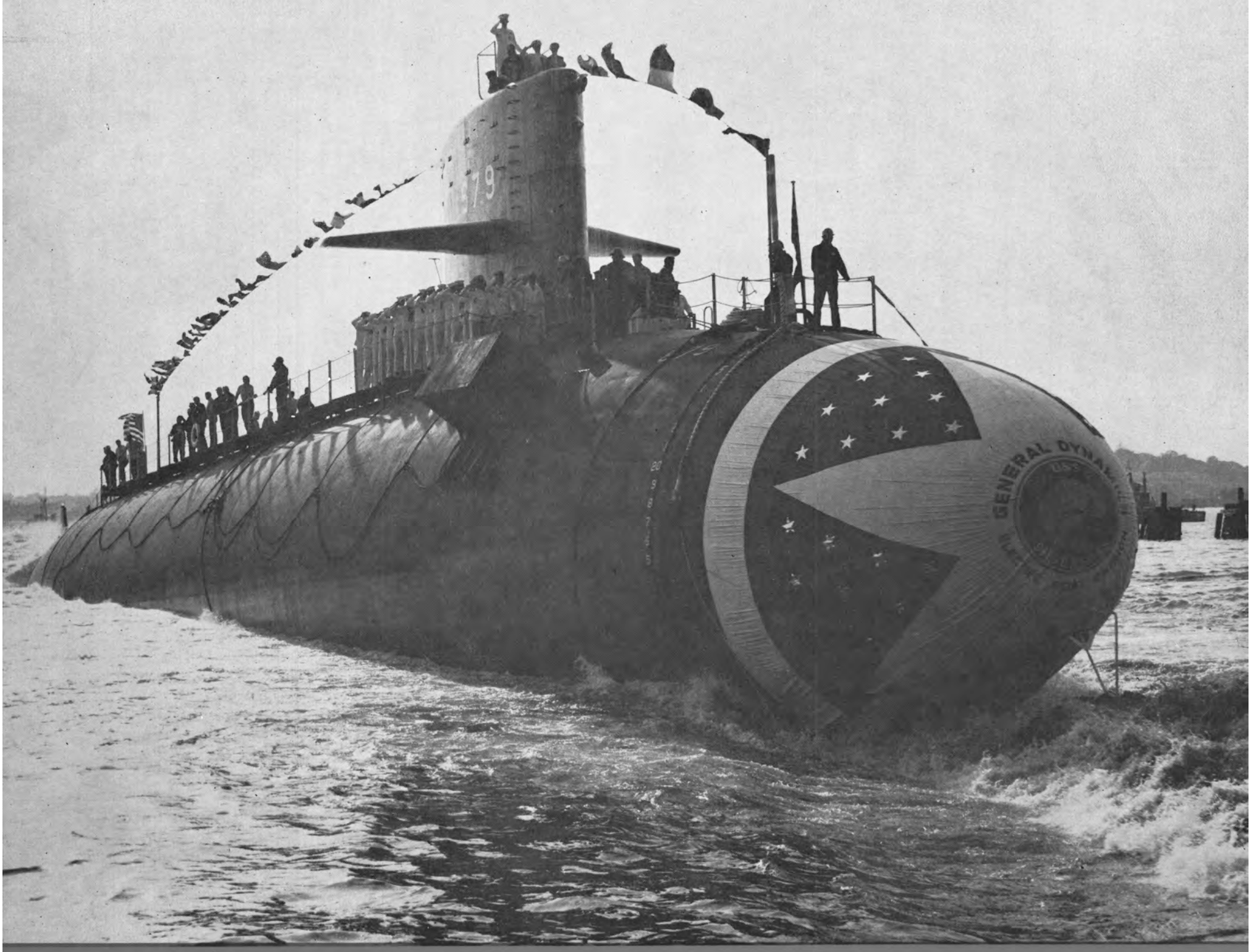

General Dynamics' Electric Boat Division Launches Navy's 100th Nuclear Submarine

(SEE PAGE 7)

JULY 1, 1971

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

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

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

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

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

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

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

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

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

Gulf

GULF OIL TRADING COMPANY,
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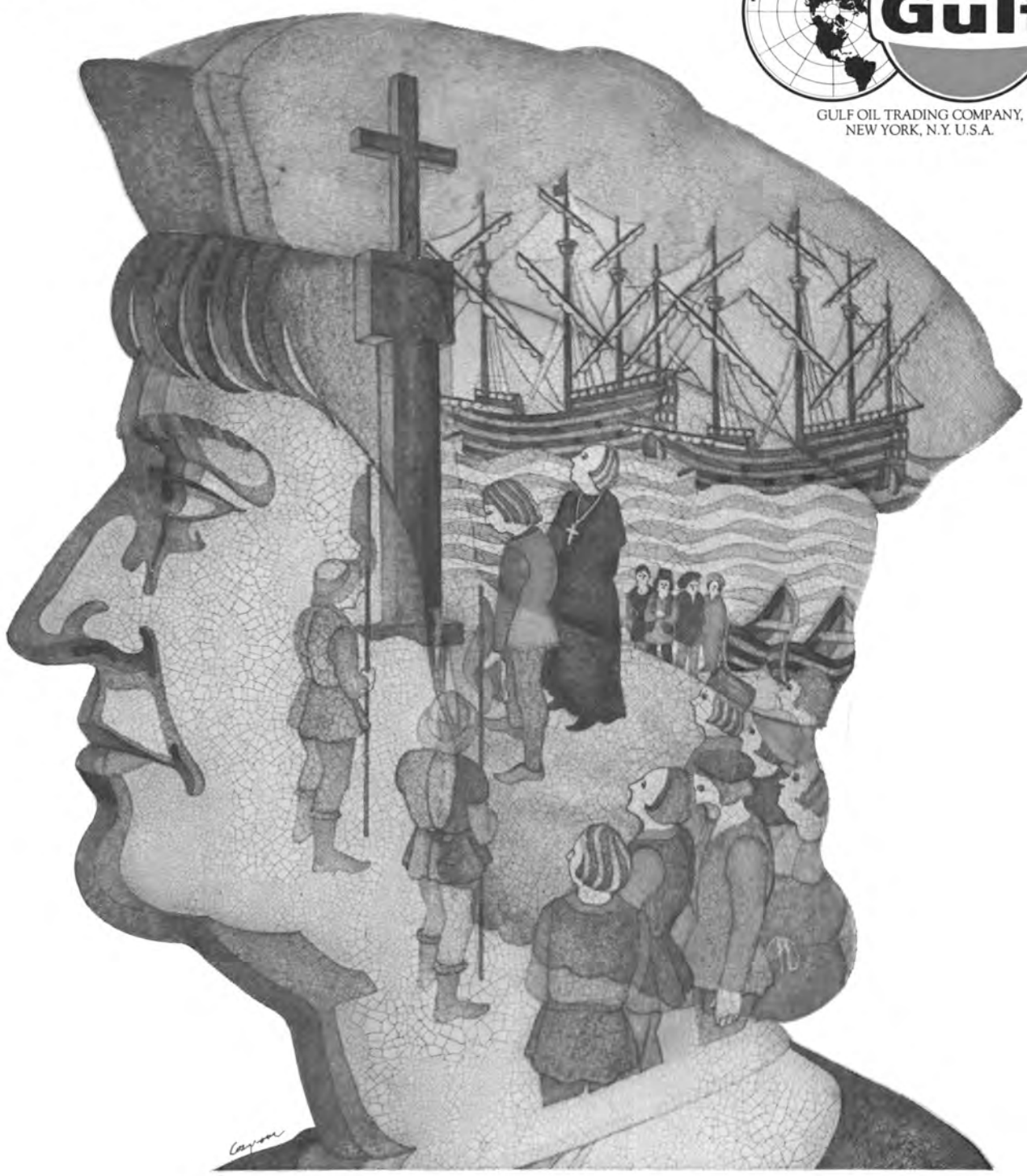


Electric Boat Division Launches

Navy's 100th Nuclear Sub

Two landmark events in the nation's submarine history, the launching of the Navy's 100th nuclear submarine Silversides, and the keel-laying for the advanced turbine-electric drive Glenard P. Lipscomb, took place on June 4 and 5 at the Electric Boat Division of General Dynamics, Groton, Conn.

At the Silversides launching, Secretary of the Navy **John H. Chafee** explained why "the facts of life for the United States" required an expanding Navy and submarine force. Calling the United States "for all practical purposes an island nation (whose) defense depends on control of the seas," he declared "that control is being challenged as it has not been in this century" by the more than 350 submarines of the Soviet Union, including 92 nuclear-powered. "This is three times the U.S. force," the Secretary said. "About 50 are capable of launching strategic ballistic missiles. Another 65 carry shorter range cruise missiles for use against ships. All are of post World War II construction, which is not the case with our submarines." The United States today has a total submarine fleet of 142 vessels, including 92 nuclear-powered, of which 41 are missile-firing.

Secretary **Chafee's** wife, **Virginia,** sponsored Silversides, breaking the traditional bottle of champagne on the ship's bow before the sub's slide into the Thames River. The vessel's commanding officer, Comdr. **Robert E. Allen** of Mamaroneck, N.Y., rode his ship into the water.

Mrs. John H. Chafee, wife of the Secretary of the Navy, breaks a bottle of champagne across the bow of the 100th nuclear attack submarine Silversides at the launching in Groton, Conn. Watching are daughter, **Georgia,** and from left, **David S. Lewis,** General Dynamics chairman; **Joseph D. Pierce,** general manager of Electric Boat Division where sub was built, and Secretary **Chafee.**

Defense Secretary **Melvin R. Laird,** speaking at the Lipscomb keel-laying ceremony, said "the characteristics of future submarines will be influenced by the lessons learned from the Lipscomb," which he called "a valuable test bed for a propulsion system and other technological advances."

Secretary **Laird** also referred to the Navy's on-going construction of nuclear attack submarines and other craft, attributing much of the drive behind the program to efforts of the late Congressman **Glenard P. Lipscomb,** for whom the new sub is named. "For the future," he said, "we have several initiatives with regard to nuclear-powered submarines. One is the Undersea Long-Range Missile System, known as ULMS. Another is for a submarine capable of launching missiles against enemy targets while remaining far beyond the enemy's anti-submarine range." Electric Boat Division is now engaged in the design and development of the ULMS submarine.

Mrs. Robert Murrell (left) of San Diego and **Mrs. Louis D. Grasso** (right) of La Plata, Md., brush slag from the keel they initiated on "quiet" submarine named after their father, the late California Congressman **Glenard P. Lipscomb.** The ceremony at Electric Boat Division of General Dynamics, Groton, Conn., included from left: Navy Secretary **John Chafee,** Vice Adm. **H.G. Rickover, Mrs. Virginia Lipscomb,** the Congressman's widow, and Defense Secretary **Melvin Laird.**

Vice Adm. **H.G. Rickover,** director of the naval nuclear propulsion program, introduced Representative **Lipscomb's** widow, **Virginia,** and her two daughters, **Mrs. Louis D. Grasso** and **Mrs. Robert Murrell,** who welded their initials into the Lipscomb's keel, assisted by Electric Boat welders **James Traylor** and **Dennis Corbitt,** both of Groton.

Admiral **Rickover** called the late Congressman "a valuable and dedicated legislator and one of the foremost authorities in national defense in Congress . . . a strong proponent of nuclear power for naval ships and a leader in support of the Navy's shipbuilding program."

David S. Lewis, chairman and chief executive officer of General Dynamics, introduced Secretaries **Laird** and **Chafee** at the two events, following welcoming remarks by **Joseph D. Pierce,** vice president of General Dynamics and general manager, Electric Boat Division. Guests at the two ceremonies included several congressmen and Government officials and some of the Navy's top submarine officers.

Lloyd's Announces Amendments To Rules

The technical committee of Lloyd's Register of Shipping has approved a number of additions and amendments to the Rules for the Construction and Classification of Steel Ships.

One of the more important amendments was a further stage in the complete revision of the 1967 Rules for ships up to approximately 295 feet in length. This stage, like the first which was approved in December 1970, relates to dry cargo ships. Similar proposals are in hand for small tankers, tugs, etc., and when they have been approved, the 1967 Rules for small ships will have been revised in their entirety.

The Rules covering the use of higher tensile steel in hull structures have been amended on the basis of satisfactory experience gained with existing ships and advances in structural analysis. The major change is that, in the future, the value of the reduction factor to be used when higher tensile steel is incorporated into a ship's structure will be based on the yield strength of the material only, the ultimate tensile strength being ignored.

Relaxations have been made in the requirements affecting the use of Grades D and E steels.

The Society's scheme for the certification of batch and line produced machinery, which has been in operation on a provisional basis for some three years, has now been revised in the light of experience. The provisional requirements of the scheme have been incorporated in Chapter G of the Rules—conditions for survey of machinery during construction—and will become Rule requirements.

The Rules for reduction gearing for propelling and auxiliary engines have been amended so that in the future, epicyclic gears will be covered by the relevant requirements of the Rules which are primarily intended to cover non-epicyclic parallel shaft gears. As a result of the reduced effect of post-hobbing on bending strength compared with pitting resistance, the requirements governing the allowable tooth loading for bending stress have been amended, and the upper limit of the allowance for post-hobbing processes on through-hardened gears has been reduced from 25 perecent to 10 percent.

The requirements of the 1970 Rules of the Finnish Board of Navigation have been incorporated in the Society's Rules for Baltic Ice Conditions.

Great Lakes Group Forms Port Association

An organization called the Western Great Lakes Port Association has been formed by representatives of ports on the shores of Lake Michigan and Lake Superior. The group includes the ports of Duluth, Green Bay, Milwaukee and Chicago, including Lake Calumet and the Navy Pier. The organization will promote the common interests of the ports and encourage the development of waterborne transportation between member ports and those outside the region, both foreign and domestic.

Michigan Students Present Unique Designs At

Gulf Section, SNAME Annual Spring Meeting

Twelve University of Michigan naval architecture students exhibited five futuristic marine designs at the spring meeting of the Gulf Section of The Society of Naval Architects and Marine Engineers held recently in New Orleans. Following the student presentation, three technical papers prepared by suppliers of ship components were presented.

The presentation by the students was part of the third student marine design program sponsored by Armco Steel Corporation. This program was developed by Armco, a major supplier of steel for the marine industry, to bring promising students into contact with practicing engineers and architects.

The all-day meeting was the 23rd annual spring meeting of the Gulf Section and drew a large attendance from the entire Gulf Coast and many other areas.

The student papers were:

1. "Pleasure Craft" by **James Gray.** It described an extremely fast yet stable cabin cruiser which sleeps four adults and would cost less than $18,000. The fiber-glass double-hull boat would be powered by two engines developing a total of 900 hp.

2. "LNG Ship" by **Robert Miller, Paul Koenig, Robert Seeger,** and **Victor Dorbu.** This paper described the design of a high-speed methane carrier, with a capacity of two million cubic feet. The students selected the route between Alaska and Japan to develop a delivery cost of 0.2. cents per cubic foot of liquefied natural gas. They figured that a cruising speed of 20 knots would reduce the time for a round trip by three days over present vessels.

The LNG carrier would be powered by a 30,000-shp steam-turbine powerplant which could be fired by the gas which boils off the five cryogenic membrane tanks.

3. "Deep Ocean Salvage System" by **Frederick Agdern, Michael Touma,** and **Frederick Partridge.** Working with known weights and sub-sea conditions, this group of students developed an ocean salvage system capable of raising a containership from water as deep as 350 feet. The system uses 800,000 pressurized plastic balls pumped into the sunken vessel through a pipeline to produce the required lifting capacity.

4. "Flipping Drill Ship" by **Thomas George, James Sandison,** and **Steven Yates.** The "flipping" drill vessel developed by these students is an unconventional design for offshore oil drilling. It is basically a huge cylinder with elliptic fairing to reduce towing resistance. The vessel was designed to decrease the motion and dynamic-positioning problems of the conventional floating and semi-submersible deep-sea drilling rigs.

The drilling rig would be towed to a drilling site in a horizontal position and then "flipped" to an upright position by flooding water ballast tanks at one end of the cylinder. Drilling into the ocean floor at depths from 250 feet to 1,000 feet would be done through the center shaft of the vessel.

5. "Tug Machinery Installation" by **Robert Latorre.** This paper presented a mechanical study of a tug-barge machinery installation which was designed to provide maximum economy and performance of engine, reduction gears and propellers.

Armco-sponsored University of Michigan group at the 23rd annual spring meeting of the Gulf Section, left to right: (kneeling) **Michael Touma, James Gray, James Sandison, Victor Dorbu,** and **Samuel Posner;** (standing) **Paul Koenig, Frederick Agdern, Robert Latorre, Thomas George, Steve Yates,** Prof. **Richard B. Couch, Robert Seeger, Robert Miller,** and **Donald L. Frisby,** senior market specialist, Armco Steel Corporation.

Gulf Section officers and speaker at the dinner-dance, were, left to right: **Larry P. Mavretish,** ABS, papers chairman; **Joseph K. Miller,** Section vice chairman; **Arthur W. Stout Jr.,** Section chairman, and **W. Michael Walsh,** Maritime Administration, featured speaker at the dinner-dance.

Attending the dinner-dance were, left to right: Comdr. **R. C. Hill,** USCG; Rear Adm. **R.A. MacPherson,** USN, commandant, 8th Naval District; **D.D. Strohmeier,** president, Society of Naval Architects and Marine Engineers, and Father **Patrick Prendergast.**

Prof. **Richard B. Couch** of the Naval Architecture and Marine Engineering Department of The College of Engineering, University of Michigan, attended the meeting to assist his students as necessary in making their presentation.

Donald L. Frisby, senior market specialist, Armco Steel Corporation, arranged for these five groups of students to make the presentations before the Gulf Section.

Following a luncheon in the Blue Room of the Roosevelt Hotel, a movie, entitled "Arctic Challenge" was shown.

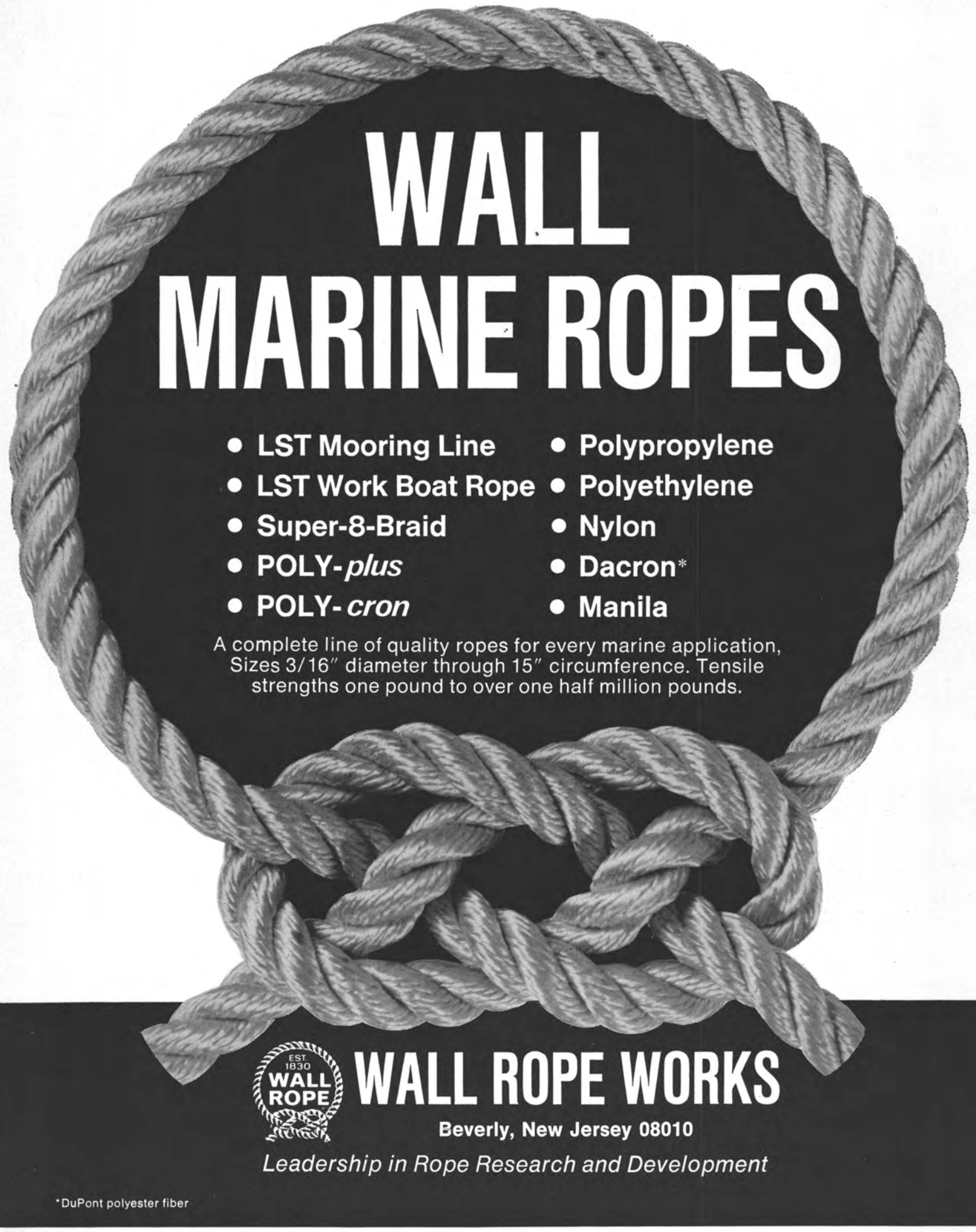
At the afternoon technical session the following three papers were presented:

1. "Application of Gas Turbines To Merchant Ships" by **J.F. Nace,** and **W.J. Hefner,** General Electric Company, Schenectady, N.Y.

The authors pointed out that two years ago, there were very few marine application engineers seriously considering gas turbines for marine propulsion. However, in the last year there has been a dramatic change, and now there is an ever increasing number of engineers analyzing the application of gas turbines for propulsion in new ship designs. The current level of application activity indicates that in a few years there will be a great many marine engineers experienced in applying gas turbines for marine propulsion. During this interval of high engineering activity, the authors feel that the guidelines selected for a

(Continued on page 10)

Attending the Gulf Section spring meeting were, left to right: (seated) authors **Harry W. Kinne, William A. Barr,** and **J.F. Nace;** (standing) **Larry P. Mavretish,** American Bureau of Shipping, papers chairman; and Comdr. **Ralph C. Hill,** USCG, vice chairman, Gulf Section.


WALL
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Gulf Section Spring Meeting

(Continued from page 8)

few ships should be helpful for all merchant vessels in the future.

The paper presented guidelines that are simple and readily applicable to two-shaft gas-turbine installations. Ratings, fuel consumption, fuel service system, heating steam, ship's service electric power, starting and cranking, weights and dimensions and recent developments are all discussed in the paper.

2. "New Concepts in Machinery Protection Aboard Ships" by **H.W. Kinne,** Reliance Electric Company, Westerville, Ohio. The following is a condensation of this paper.

This paper discusses the instrumentation techniques available to protect rotating machinery against:

a. Unexpected downtime,
b. High maintenance costs,
c. Shortened operating life, and
d. Catastrophic failure.

The techniques that are generally used are lumped into the general category of "machinery protection."

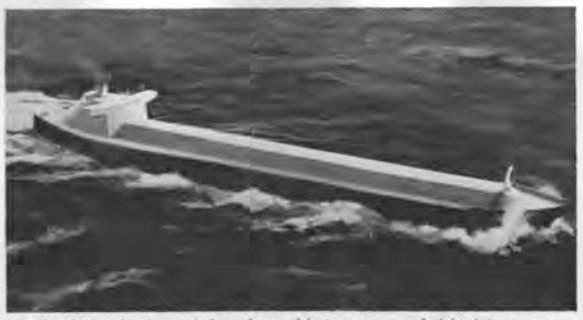
In general, machinery protection includes the parameters of temperature, vibration and speed. Temperature and speed have been widely used in the marine industry for some time. Temperature for such things as bearings, motor windings and pump cases—speed for such things as drives, turbine overspeed and turbine start-up. Vibration is the new item and is the main thrust of this paper.

Some things about vibration are not all bad.

It is common to all rotating equipment—a given malady looks the same on a kitchen fan as it does on a high-speed turbine. This makes it an exact science, founded on physical law. In relation to revolutions-per-minute, each specific problem, i.e., imbalance, misalignment, mechanical looseness, non-concentric gears, etc., always have a specific, predictable amplitude frequency relationship. Therefore, if we are monitoring a piece of machinery and an alarm tells us that the vibration of the inboard bearing has exceeded a preset limit, we can find out why. This is done by tuning a filter to the offending frequency, much as one tunes his radio to a specific station. Given the available information as to amplitude, direction and frequency we can pinpoint the cause. This would allow the engineer in charge to shutdown at a convenient time and do only the maintenance necessary. A further advantage is that he can predict the amount of downtime needed since he will have predetermined the time needed to solve a specific problem, as opposed to hit and miss maintenance techniques.

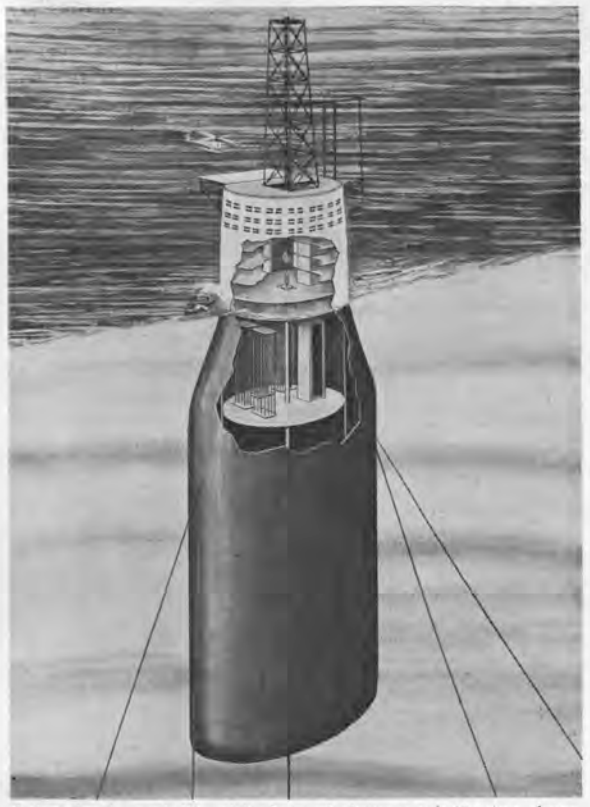
How do we monitor vibration? We do it generally by using a vibration transducer on the machine to convert either a displacement, velocity or acceleration signal into voltage which in turn read out on a meter in terms of displacement, acceleration or velocity. Two limits are generally used and an alarm is sounded when vibration exceeds a preset limit. Further, a second alarm is sounded and/or the machine is shutdown when the vibration becomes so excessive as to make us fear a catastrophic failure.

Usually there is little time for long discussions about whether or not a machine should be allowed to continue its operation. In the case of the shipping industry, large sums of money can be lost because of delays due to the outage of a key piece of equipment, either at sea or in dock. If we look at the case of industrial users of vibration monitoring, particularly in the process industries, an unexpected shutdown causes emergency dumping of costly intermediates of feed stock which results in a total loss. This condition has led to buttons with the legend "Emergency Stop" and with a warning alongside reading



LNG ship designed by four University of Michigan students participating in the Armco program. The ship has a cargo capacity of two million cubic feet, a speed of 20 knots, a length of 850 feet, a beam of 110 feet, and a displacement of 56,100 tons.

Unique salvage system shown by students at Gulf Section spring meeting uses 800,000 plastic balls pumped into the holds and six nets attached to a sunken 600-foot ship to provide negative buoyancy to raise the ship for towing.



A bottle-shaped flip ship intended to revolutionize deep-sea oil drilling was designed to be towed to a drilling site in a horizontal position and then flipped to an upright position. The project was part of the third student marine-design program sponsored by Armco Steel Corp.

"Think!" Pushing this button costs $27,000. A key question before shutting a machine down, obviously, is what is the problem? If it is an unbalanced condition in a turbine, perhaps you can slow the turbine down to partial speed and still maintain operation until it is convenient to bring it off the line. On the other hand, if it's high vibration that is caused by a gear box with the gear teeth already sheared off, perhaps your ability to decide is limited to "let's shut it down."

The objective is to strive for a minimum "regret factor." This is different from minimum cost because the decision maker does not control the incurred cost. The solution is to be as certain as possible that no additional cost is incurred through that decision making.

3. "LASH Containerization and the Cradle/Crown Traction Concept" by **William A. Barr,** Milwaukee Gear Company, Milwaukee, Wis. The following is a condensation of this paper.

Although we are usually not conscious of it, history is often taking place before our eyes. Here is a recent, but rather vital, entry in the master log of good ship containerization.

It all started a generation back on the campus of one of our marine engineering universities. A professor advanced the proposition that it would pay more to invest in methods of fast port turnaround rather than invest in horsepower to increase ships' cruising speeds.

Today we are seeing such thinking manifested in several ways, but each with the purpose of moving the cargo on and off ships faster, and each under the general term—containerization.

One outstanding example is the LASH (Lighter Aboard Ship) concept of the New Orleans naval architecture firm of Friede and Goldman.

The unique elements of the LASH concept are the containership and the huge length-traversing gantry crane. This association, it turns out, is much easier to describe than to bring about.

The large crane manufacturers of our country and their industry follow standards and practices which are necessarily and generically different than those of the shipbuilders. It is a challenge for the crane manufacturer to develop such a radical new gantry crane. But the joining of the two dissimilar elements into a common system is an ambitious, if not an audacious undertaking.

The LASH design calls for a deadweight crane lift of 450 tons and for a leg span of 70 feet. The crane rails on each side extend for 600 feet. Traction for this movement requires the engagement of four 150-hp motor-driven pinions (two port and two starboard) with straight racks.

Specifications originally called for 8-inch wide tracks with teeth mounted vertically, 1 diametral pitch, and 17-tooth pinions capable of swivelling to accommodate the inevitable alignment variations resulting from many ship and crane tolerance accumulations and deflections.

After receiving bids from six gear manufacturers, one proposal stood out as being unique. Whereas five manufacturers proposed racks with machine-cut teeth with an 8-inch face, one company offered flame-cut racks with a 7-inch face.

To the credit of the engineers at the shipyard, an opportunity was afforded the rack and pinion manufacturer to justify its bold proposal; bold, not only because the teeth were not machined, but because the rack is made up of two longitudinal tiers cemented together.

To their credit, the attitude of the shipbuilder was not so much, How are the racks made?—but rather, How will they perform? With this objectivity, it was possible for the gear manufacturer to conceive and develop for the first time what is now known as the Cradle/Crown Traction Concept.

The Acadia Forest is the first LASH ship and was Japanese built. She and her sistership have machine-cut racks. It is a commentary on the low Japanese manufacturing costs that such a luxury could be afforded. However, American shipyards are faced with the challenge for something better, yet cheaper. Ingenuity is our only weapon against low-cost foreign labor and material.

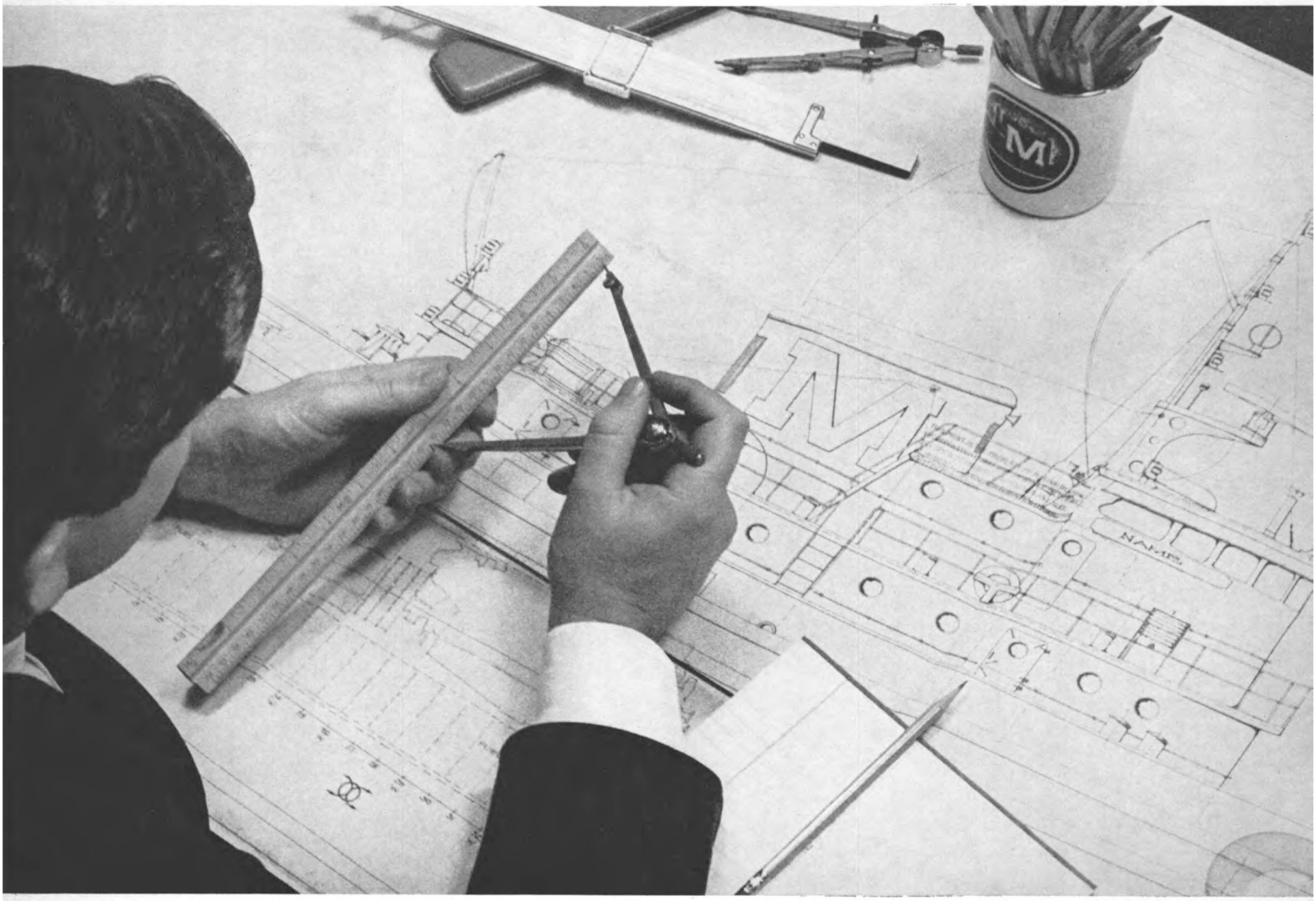
I submit that the Cradle/Crown concept, the rack/rail alignment concept, and the precision flame-cut racks with overlapping two-tiered sections, is a fitting example of this required ingenuity and economy.

With tankers and freighters becoming larger and larger and with turn around time and prompt port schedules more often than not spelling the difference between profit and loss, Moran's designers are keeping pace with the needs of the Maritime Industry.

Moran's fleet today is the most modern afloat and designed to meet the most demanding requirements. New and more powerful tugs currently under construction will soon augment this fleet.

Efforts are constantly being directed toward providing the ultimate in economy, safety and performance. The needs of the future are being anticipated and incorporated in plans now on Moran's drawing boards.

Whatever tomorrow may bring, Moran promises to maintain its position of leadership with the newest equipment and facilities to serve you better.



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Nantucket Boat Inc. Names Barry Fuller

Capt. Barry Fuller

Hyannis-to-the-Islands Cruises, a service of Nantucket Boat, Inc., Hyannis, Mass., has announced the appointment of Capt. **Barry Fuller** from assistant manager to general manager of all operations.

Captain **Fuller** is a native of Taunton, Mass., and a 1961 graduate of the Massachusetts Maritime Academy. His experience portfolio includes: sailed third officer with Sun Oil Company and American Export Isbrandtsen Lines from 1961-64, when he joined Aetna Casualty & Surety Company as safety engineer and marine surveyor. Captain **Fuller** joined Nantucket Boat in 1966 as ships officer and was later promoted to assistant manager.

SNAME Awards Three Graduate Scholarships

The award of three graduate scholarships for the 1971-72 academic year has been announced by The Society of Naval Architects and Marine Engineers, now in its 78th year of continuous activity. The recipients were selected from a total of 25 applicants by the Society's scholarship committee, chaired by **Frank L. Pavlik** and approved at a recent meeting of the executive committee of the Society.

The first recipient, who will study ship motions and fluid dynamics at the University of Michigan and who is also designated as the Society's "Wilbur N. Landers Scholar" for 1971, is **Armin W. Troesch.**

The recipient of the second award plans advanced study in ship economics at Harvard Business School. He is **David Smith Miller,** a graduate of Michigan, with a B.S.E. degree in naval architecture and marine engineering.

The recipient of the third award, who will study ship hydrodynamics at the University of Michigan, is **Robert George Latorre.**

Named as alternates, in order, were: **Paul Davies Chapman, James Warren St. John, Charles Steven Yates, Cecil Bruce Shaver** and **Dale Roberts Banks.**

The competition for the scholarships was nationwide and open to all who could qualify. The scholarships committee of the Society carefully studied the merits of each applicant and the winners were selected on the basis of character, leadership and general promise for a future in the marine industry, as well as for scholastic ability and the desire to pursue advanced study. The total monetary value of the three graduate scholarships is $13,580. Included in each award is the tuition fee charged, plus a living expense stipend of $2,100.

In addition to the above scholarships for graduate study, the Society is continuing its program of undergraduate scholarships awards started 13 years ago. This undergraduate plan is now maintained with scholarship grants at the Massachusetts Institute of Technology, the University of Michigan, and the University of California at Berkeley. Under this program, it is anticipated that a total of 10 undergraduates will each receive $1,000 during the 1971-72 academic year.

Interested high school and preparatory school students should inquire directly with these three colleges and not with the Society.

The basic objective of the undergraduate scholarship program is to encourage new men to enter the maritime industry, particularly in the technical fields of naval architecture and marine engineering.

The Society is again making an annual grant to Webb Institute of Naval Architecture, Glen Cove, N.Y., to assist in training young men at this specialty school for the maritime industry.

New York Towboat & Harbor Carriers Assn. Reelects T.E. Moran

Thomas E. Moran, president of Moran Towing Corporation, was reelected as chairman of the board of directors of The New York Towboat & Harbor Carriers Association at the annual meeting held at the Association's headquarters on June 2.

Other officers reelected were **William E. Cleary,** president; **Michael G. Lorenzo,** treasurer; **Thomas F. Horan,** president of Horan Transportation Company, secretary, and **Eugene J. O'Connor,** assistant secretary.

Directors newly elected for terms of two years each were **E.T. Buchanan Jr.,** president of the Bronx Towing Line, Inc.; **John F. Bandon,** marine manager of the Appalachian Stone Division of Martin Marietta Corporation, and **William Van Pelt,** president of the Gowanus Towing Line. Directors reelected for two-year terms were **Francis B. Bushey,** president of Spentonbush Transport Service, Inc.; **J. Frank Belford,** director of Moran Towing & Transportation Company, Inc.; **Henry S. Gillen,** president Henry Gillen's Sons Lighterage, Inc.; **Harold F. Madden,** vice president of the McCormack Sand Division of Penn Industries, Inc.; **James F. Murphy Jr.,** vice president, Gallagher Brothers Sand and Gravel Company; **Edwin P. Poling,** marine manager, Poling Transportation Corporation; **Harold A. Reinauer,** president, Reinauer Transportation Companies; **William T. Tracy,** president Tracy Towing Line, Inc.; **J.W. Von Herbulis,** president, Pittston Marine Corporation; **Robert J. Hughes,** president, James Hughes, Inc., and **J. Rich Steers Jr.,** president, Steers Equipment Corporation.

Thomas E. Moran

"Hold over" directors, whose terms expire at the 1972 annual meeting of the Association, are Mr. **Moran; James P. McAllister,** president, McAllister Brothers, Inc.; **Fred Baum,** vice president, Morania Oil Tankers Corporation; **Terry E. Buchanan,** marine department, Colonial Sand and Stone Company; **Melvin E. Lemmerhirt,** vice president, Great Lakes Dredge and Dock Company; **Frank J. O'Brien Jr.,** vice president, Russell Brothers Oil Transportation Division of McAllister Brothers, Inc.; **John J. Reichert,** president, Reichert Towing Line, Inc.; **Robert W. Sanders,** president, Red Star Towing & Transportation Company; **Bart J. Turecamo,** president, Turecamo Coastal and Harbor Towing Company; **Albert A. Tangredi,** manager of distribution, New York Trap Rock Corporation; **Morton S. Bouchard Jr.,** vice president, Bouchard Transportation Company, Inc., and Mr. **Horan.**

The Association represents over 50 companies operating tugboats, barges and shallow-draft motor tankers on the waters of New York Harbor, Long Island Sound and the Hudson River.

Gunderson Building Shaver Grain Barges

Gunderson, Inc., Portland, Ore., based marine construction firm, announced they have received an order to build two grain barges for Shaver Transportation Company, also of Portland. The 207-foot by 42-foot by 15-foot river barges, named ST 35 and ST 36, each have 102,000 cubic feet of space, with grain capacities of 2,650 tons of wheat or 2,100 tons of barley.

Valued at a total of $700,000, the two barges will be used on the Columbia River between Vancouver and Pasco, Wash.

Don Hudson & Associates, naval architects, are designers. Gunderson, Inc. is a subsidiary of FMC Corporation, San Jose, Calif.

Maritime Fruit Carriers Subsidiary Reaches Agreement With Getty Oil (Canadian)

Maritime Fruit Carriers Company Limited (OTC), international shipping concern, has announced that its 70-percent owned subsidiary, Oil Ventures International Inc., has reached an agreement with Getty Oil (Canadian Operations) Ltd., relating to its 20 exploration permits covering 1,550 square miles offshore Baffin Island, Canada.

Under the terms of the agreement, Getty Oil assumes all exploration commitments called for by the permits. Oil Ventures International Inc. will receive a refund for all cash advanced and retain a three percent overriding royalty interest in this concession. This agreement will be consummated upon acceptance of the permits for transfer by the Canadian Government.

Caribbean Shipping Association Announces Plans To Establish Headquarters In Jamaica

Jamaica is to be headquarters of the newly formed Caribbean Shipping Association, according to **William G. Whiting,** U.S. director of the Jamaica Industrial Development Corporation.

The new regional shipping body's constitution was drafted by Jamaica. It is designed to facilitate the exchange of experience, advice and information among all parties actively interested in the shipping industry of the Caribbean.

Mr. **Whiting** said: "Roll-on/roll-off cargo service between Jamaica and the U.S. and Jamaica and Europe is burgeoning. For example, Tropical Shipping offers once-a-week service to and from Palm Beach; Caribbean Trailer Express and Amerind service the Jamaica-New York route once a week; and Pan American Mail Line, Norwegian Caribbean Line and Kirkconnel Line each provide weekly service between Miami and Jamaica.

"In addition to its U.S.-Jamaica sailings, Sea-Land Service, Inc. began a weekly containership service in 1970 that provides door-to-door, door-to-pier and pier-to-pier service to Kingston from six ports in Spain, France and Italy."

Among the latest entrants are those of Atlantic Lines, whose new roll-on/roll-off containership Atlantic Jamaican will shortly begin a New York-Bermuda-Jamaica service, and Trans-Caribbean Shipping Co. Ltd., whose Montego-based Seahawk recently inaugurated a Florida-Jamaica cargo service.

Delta Steamship Lines Names New Officers

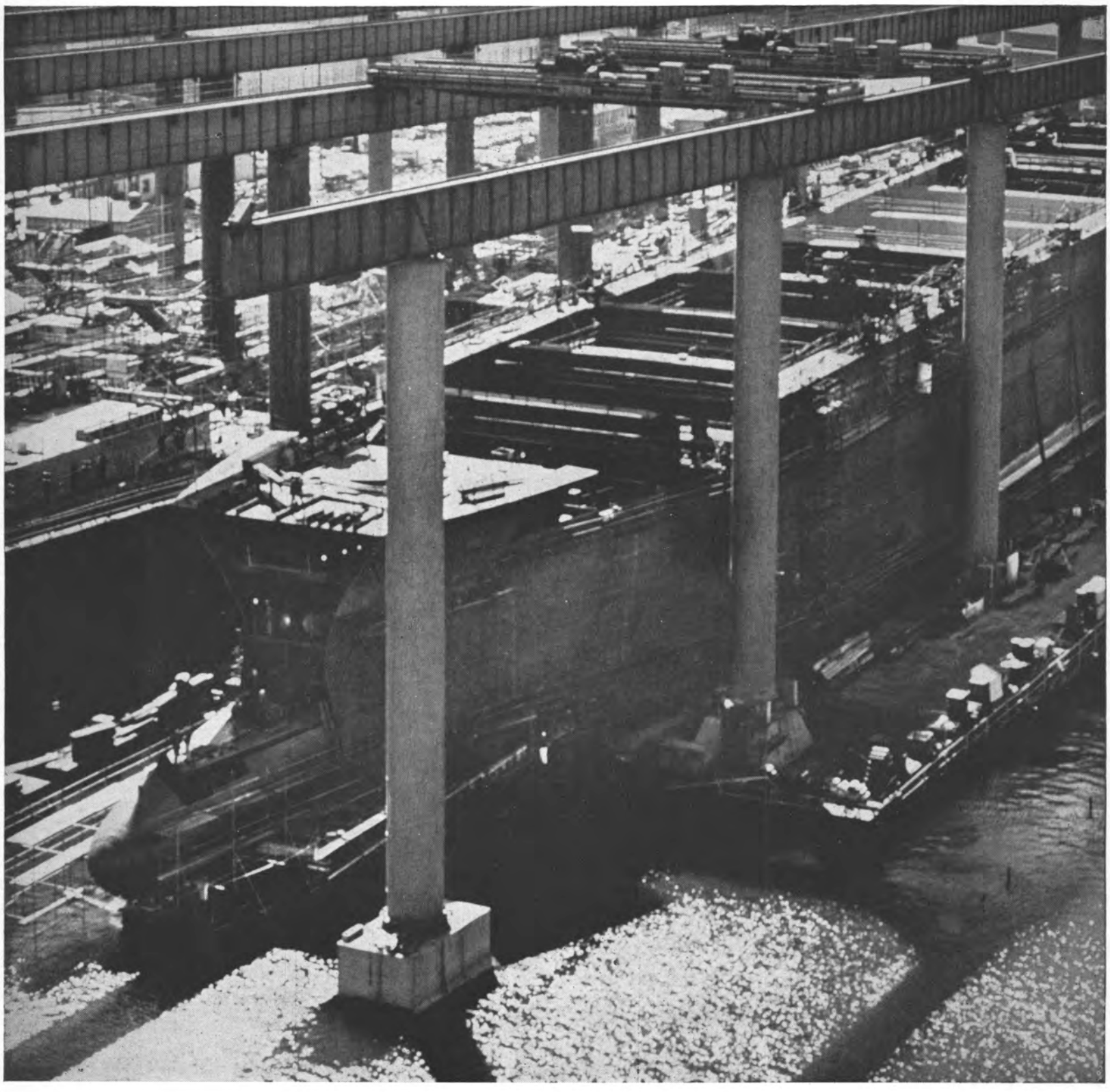
James F. Badger

Capt. Daniel P. Kirby

The election of several new corporate officers was announced by Delta Steamship Lines, Inc., pioneer New Orleans, La., based owner and operator of a fleet of American-flag cargo vessels serving the Caribbean area, the East Coast of South America, and West Africa, from ports in the Gulf of Mexico.

Capt. **J.W. Clark,** president, on behalf of Delta's board of directors, announced the following promotions: **James F. Badger,** to be vice president, traffic; Capt. **Daniel P. Kirby,** to be vice president, operations; **Robert G. Hughes Jr.,** to be assistant vice president, traffic, West Africa; **J. Durel Landry Jr.,** to be assistant vice president, intermodal systems; **Robert N. Burguieres,** to be assistant vice president and assistant secretary, and **Robert J. Nolan,** to be assistant vice president and assistant treasurer.

EASTERN CANADIAN SECTION MEETS: A paper titled "Some Considerations in the Design of Polar Icebreakers" was presented by three members of the Society—**J.G. German,** M.Sc., P.Eng.; **C.F. Collins,** P.Eng., M.I.M.A.R.E., and **A.R. Webster,** P.Eng., F.R.I.N.A.—to the Eastern Canadian Section of The Society of Naval Architects and Marine Engineers at its recent annual general meeting. The authors jointly presented a very interesting paper dealing with the design of polar icebreakers and their future in light of the current discovery of vast deposits of natural resources in the Arctic. Following the paper, a film was shown of the recent voyage of the Manhattan, and the Canadian icebreakers Louis S. St. Laurent and John A. MacDonald, performing icebreaking duty. Upon conclusion of the discussion from the members and guests, the authors were thanked by Comdre. **J. Deane,** RCN (ret.). The three authors pictured above, from left to right, are **J. Gordon German, A.R. Webster,** and **Charles F. Collins.**



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The Sea-Land containership *Chicago* nicely demonstrates the speed and the economy of Todd's conversion work. The forebody shown here – 533 feet long – was constructed and joined by Todd to an existing stern. Jumboizing techniques like this can generate new tonnage at about one-half the cost of building a whole new ship, in about one-third the time. Save time and money with Todd conversions.

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Talk to TODD

$83.8 Million To Avondale To Build Three LASH Vessels For Waterman Steamship Corp.

An $83.8-million shipbuilding contract—the second to be awarded under President **Nixon's** 10-year program to revitalize the American merchant marine—was announced by **A.E. Gibson,** Assistant Secretary of Commerce for Maritime Affairs. The contract covers the construction of three Lighter-Aboard-Ship (LASH) vessels for the Waterman Steamship Corporation by Avondale Shipyards, Inc. of New Orleans, La. Previously, on May 19, Avondale was awarded an $85.6-million contract to construct three similar LASH vessels for Delta Steamship Lines—the first flight of new ships generated by the President's program.

"These two contracts, aggregating nearly $170 million, will provide 4,000 man-years of work for shipyard employees," Mr. **Gibson** noted. "Additionally, since some $85 million in materials and equipment from 28 states will go into these ships, these contracts will stimulate additional employment opportunities in other industries," he added.

The Waterman ships, which will be delivered between December 1973 and May 1974, will operate on Trade Route 18 between U.S. Atlantic and Gulf Coast ports and Red Sea, Persian Gulf and Indian Ocean ports. The Government will subsidize the difference between Avondale's price and the cost of building the three ships in a low cost foreign shipyard. Tentatively, this construction-differential subsidy has been established at 44.2 percent of the $83,787,000 contract price, pending final review of foreign cost data.

Each of the Waterman ships will measure 893 feet 4 inches (including a 48-foot overhang of the lighter-handling crane at the stern), have a 100-foot beam, 60-foot depth, and accommodate 89 cargo lighters measuring 61½-feet long by 31-feet wide and 13-feet deep. At the design draft of 28 feet, each ship will have a deadweight of 39,100 tons. A 32,000 shaft horsepower propulsion plant will provide a service speed of 22 knots. The Maritime Subsidy Board has stipulated that the subsidized manning scale for these vessels will be 32 crewmen, excluding cadets.

Additionally, Waterman was awarded an operating-differential subsidy contract covering eight existing vessels operating on Trade Route 18. Six of these vessels, which are breakbulk vessels of C-3 design, will be replaced by the new LASH vessels. Under the terms of the ODS contract the line is required to contract by November 26, 1977 for the construction of a new vessel or vessels to replace the other two breakbulk vessels, which are of a C-4 design.

The LASH design, developed by the naval architectural firm of Friede & Goldman of New Orleans, introduces a new, innovative shipping system which facilitates rapid cargo handling and reduces port turnaround time. Each LASH ship is equipped with a 500-ton traveling gantry crane for loading and discharging the cargo lighters over the stern. The crane has the capacity to handle as many as four loaded lighters containing nearly 1,600 tons of cargo in an hour, as compared to 75 tons per hour handled by conventional breakbulk cargo ships using winch and boom gear.

The LASH mother ships are ideally suited for service to ports having draft limitations since the lighters can be loaded or unloaded offshore and handled by tugboats. This feature will also enable them to avoid the delays encountered by conventional ships entering congested ports.

The Waterman contract brings to 17 the number of LASH vessels ordered from Avondale Shipyards. Two of the five ordered by Prudential-Grace Lines are currently in service to Mediterranean ports. Six additional units are on order or under construction for Pacific Far East Line. The 11 Prudential-Grace Lines and Pacific Far East Line LASH ships are somewhat smaller than those ordered by Delta and Waterman—measuring 820 feet in length as compared to the 893-foot length of the recently contracted vessels.

Participating in the contract signing with Mr. **Gibson** were **Edward P. Walsh,** president of Waterman Steamship Corporation, and **Henry Zac Carter,** president of Avondale Shipyards, Inc.

"The lowest bid received was from a place called Osaka, Japan."

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$85 MILLION CONTRACT: Contracts totaling approximately $85 million were recently signed in Washington, D.C., for construction of three combination LASH/Container vessels for Delta Steamship Lines, New Orleans, La., based owner and operator of a fleet of American-flag vessels. The three container/barge-carrying vessels will be constructed by Avondale Shipyards at New Orleans. Deliveries are scheduled for April 15, July 15, and September 30, 1973. Signing of the contracts took place in the office of Assistant Secretary of Commerce—and Maritime Administrator—**Andrew E. Gibson.** Principals at the signing (seated, from left) are Capt. **J.W. Clark,** Delta president; Mr. **Gibson** and **Henry Zac Carter,** president of Avondale Shipyards. Standing are **Jerome L. Goldman** (left), president of Friede and Goldman, Inc., naval architects who developed the LASH design, and U.S. Senator **Russell B. Long** (D-La.).

Dixie Dredge Corp. Names Jack T. Dunn Vice Pres. Operations

Jack T. Dunn

Dixie Dredge Corporation has announced the appointment of **Jack T. Dunn** to the position of vice president, operations. Mr. **Dunn** will be based at the company's general offices in St. Louis, Mo., and will be in charge of operations at both the Miami, Fla. and St. Louis plants.

In making the announcement, **Don R. King,** president of Dixie, noted that this appointment is another important step in the continuing expansion of the company's facilities and staff. According to Mr. **King,** the carefully planned expansion program is on schedule toward its announced objective of moving the company into a position of world leadership in the portable dredge industry. He said sales projections for 1971 forecast an increase of over 50 percent above 1970 sales, and first-quarter sales are well ahead of that schedule.

"We are very pleased to add Mr. **Dunn** to our management staff. His several years' experience in the portable dredge field includes positions of chief engineer and sales manager for leading portable dredge manufacturers. His experience and ability will materially increase our capabilities in serving the needs of our customers and in improving our products. It will, furthermore, release other key personnel to other important roles such as product development and customer service," Mr. **King** stated.

BFG Aerospace Div. Now Manufacturing Cutless Bearings

B.F. Goodrich Aerospace and Defense Products is now manufacturing the rubber cutless bearings used on propeller shafts of boats, ships and industrial pumps.

The water-lubricated bearings were made by BFG's industrial products division until recently.

Wayne Galloway, who has been named manager of marine and missile components for BFG Aerospace and Defense Products, said realignment of manufacturing responsibility within the B.F. Goodrich Company put cutless bearing production in the division, which deals primarily with sea, air, and heavy land transportation.

Mr. **Galloway** said the bearings will continue to be made in the Akron B.F. Goodrich plant and distributed nationally and internationally by Lucian Q. Moffitt, Inc., of Akron.

Mr. **Galloway,** who held foreman positions in cutless bearing production after he returned from Air Force service during World War II, was named field sales engineer in aviation products in 1954, product manager of space suits in 1957, and product manager for missile and space components in 1966. He was B.F. Goodrich representative at Cape Kennedy for each of the Project Mercury orbital space flights.

Stan Smith Joins PAC Companies

Stan Smith

Thomas E. Garside, vice president, recently announced that **Stan Smith** has joined the PAC Companies in a business development capacity. Mr. **Smith,** a graduate of the University of Southern California, has been admitted to practice before the Interstate Commerce Commission and the Federal Maritime Board. Well known in West Coast marine circles, he has been associated with the marine towing industry in the Pacific Northwest and Alaska for an extended period. Prior to joining the PAC Companies, Mr. **Smith** was the president of Alaska Marine Lines.

As diversified tug and barge companies, PAC operates on the West Coast and in Alaska, both intercoastal and on the inland waterways. In addition to worldwide deepsea towing and ocean transportation capabilities, the PAC Companies have extensive international operations concentrated in Southeast Asia.

Mr. **Garside** noted that as a growth company with operations around the world, PAC is uniquely dependent upon its people. Modern industry in general, and the tug-barge industry in particular, is experiencing change at a rate unparalleled in history. To cope with this change requires flexibility. As a means of furthering this requirement, as well as expanding and marketing new services, Mr. **Smith** will focus his attention upon developing business opportunities for PAC on the Pacific Coast and Alaska.

IHI To Build Four More Tankers For Esso Tankers Inc.

IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.) of Japan recently received an order for four 29,000-dwt petroleum products carriers from Esso Tankers Inc., U.S.A.

The 29,000-dwt (or 17,800 gt) products carriers will have the following approximate measurements: overall length, 558 feet; length between perpendiculars, 532 feet; breadth, 85 feet; depth, 47 feet, and draft, 36 feet. Powered by an 11,550-bhp IHI-Sulzer 7RND68 type diesel engine, each ship will run at a speed of 16 knots. The tankers will be built at IHI's Aioi Shipyard, with deliveries scheduled for January through October 1974. After completion, they will be used for carrying secondary petroleum products, such as gasoline, kerosene, light oil and heavy oil.

With the new order, a total of 48 products carriers have so far been ordered from IHI by overseas shipowners.

IHI previously delivered a total of fourteen 21,000-dwt products carriers to Esso Tankers Inc., ordered by the company in 1966 and 1967.

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Bethlehem Steel Names Danielson And Miller

The appointments of **Roland V. Danielson** as assistant manager, ship development and sales, and of **Robert W. Miller** as assistant manager, special products sales, Baltimore district, have been announced by **Walter F. Williams,** vice president of Bethlehem Steel Corporation in charge of shipbuilding.

Mr. **Danielson,** who had served as chief of basic ship design for the Central Technical Division at Sparrows Point, Md., joined the Bethlehem organization in 1942, following his graduation from the Massachusetts Institute of Technology, with a bachelor's degree in naval architecture and marine engineering.

Mr. **Williams** said Mr. **Danielson,** who will remain in the Baltimore area, will report to **Hollinshead deLuce,** manager of ship development and sales, New York City. He will assist Mr. **deLuce** in sales, marketing and ship development and will coordinate the efforts of the Sparrows Point shipyard and the Central Technical Division in such matters for the vice president's office.

Mr. **Miller,** formerly superintendent of miscellaneous sales for the Sparrows Point yard, graduated from Duke University in 1936 with a B.S. degree in chemistry and joined the Bethlehem organization in 1942.

Mr. **Williams** said that Mr. **Miller** will remain in Baltimore and will be responsible for the sales, coordination and implementation of special products for the Sparrows Point and Baltimore shipyards.

Devoe Marine Div. Celanese Coatings Appoints DeKreek

Jack DeKreek

Clete Pinaire, vice president of marketing, Devoe Marine Division of Celanese Coatings Company, has announced the appointment of **Jack DeKreek** as manager of its European operation.

In his new position, Mr. **DeKreek** will be responsible for sales, planning, developing and implementing a marine marketing strategy for all of Europe, Mr. **Pinaire** said.

Mr. **DeKreek** joins Devoe and Raynolds Company, Inc., a subsidiary of Celanese Coatings Company, from Pieter Schoen & Zoon, Rotterdam, Holland, where he was employed in the marine division for 25 years. During that time, he held a number of positions from sales representative to general manager.

Mr. **DeKreek** is headquartered in Rotterdam.

Mobil Oil Orders Three 26,500-Dwt Tankers From Finland

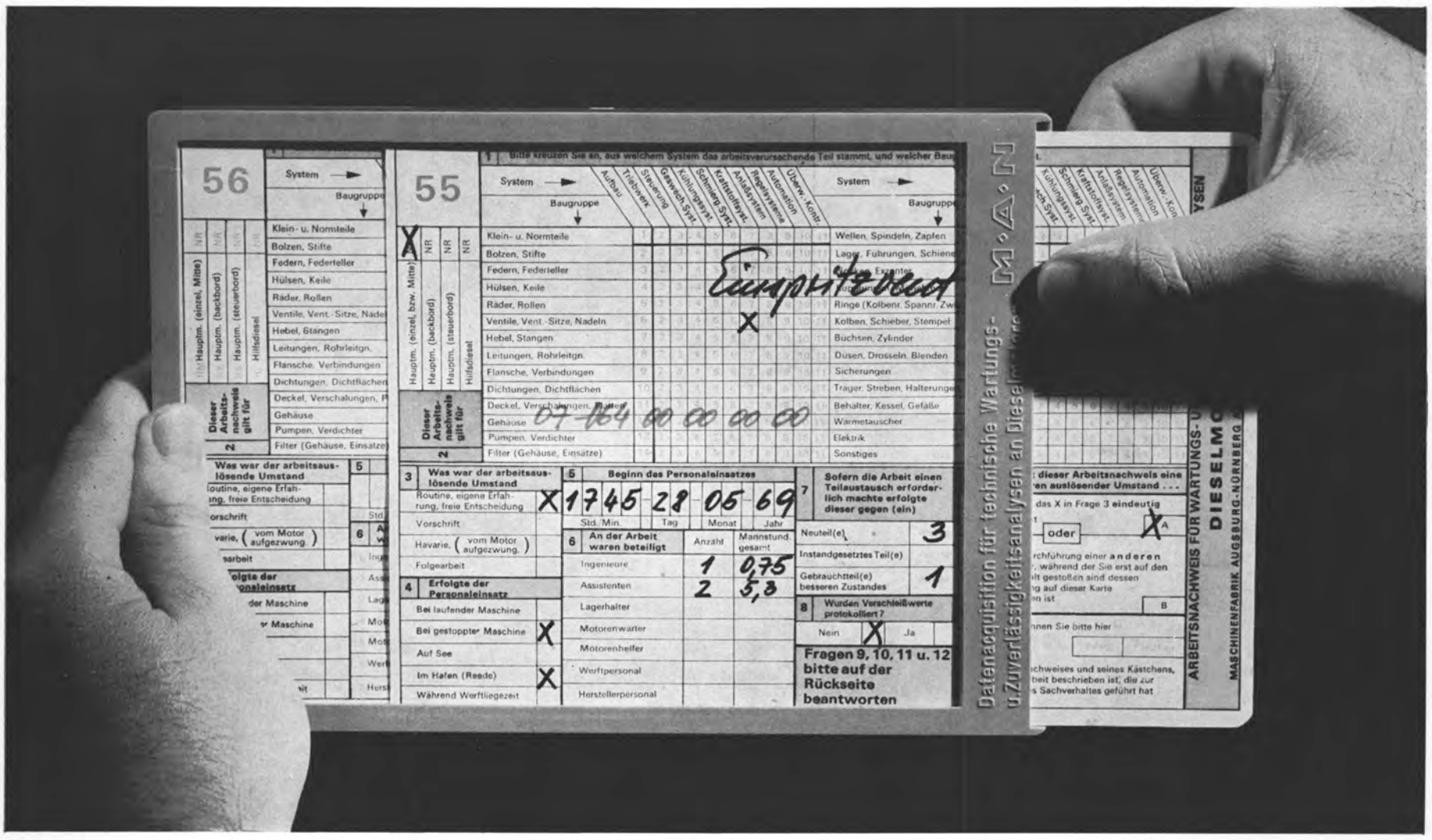
The first Mobil Oil Corporation tankers to be built in Finland—and the largest ever built in that country—have been ordered from Rauma-Repola Oy shipyards by Mobil Tankers Company (Liberia) Limited.

The contract calls for delivery of three 26,500-deadweight-ton tankers in 1974. In financial terms, the order is believed to be the largest placed with a Finnish shipyard.

The vessels will carry refined petroleum products from Mobil refineries to distribution points around the world. Heavy fuel oil and crude movements are also possible because double-bottoms under the center tanks permit structural stiffeners to be built on the outside surfaces of the tanks. This feature, coupled with epoxy coatings on piping and interior tank surfaces, will enable crews to remove all traces of fuel or crude oil from the tanks in a few hours to ready them for the next cargo.

The vessels will be 560 feet long and 85 feet wide and will be powered by 12,000-bhp diesel engines.

M.A.N.'s Reliability Program: Work Analysis



For their large original and licence-built marine engines, M.A.N. have developed a systems-oriented reliability programme. It consists of three essential parts: 1. Work analysis, 2. Wear data analysis, 3. Engine readings. Work analysis is the continuous and complete recording of all the work carried out on an engine. The Engineers aboard the vessel record the 'events' on cards. At M.A.N. the computer arranges them in systematic order, checks them for plausibility and finally evaluates them. Reliability technology consequently leads to design improvements, recommendations for optimal engine operation including selection of fuels and lubricants as well as perfection of maintenance charts.

M·A·N

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500 Fifth Avenue, Room 5416,
New York, N. Y. 10036

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U.S. Lines Finances Two Containerships With G.E. Credit Corp.

The United States Lines revealed that it has departed from Title XI in financing two recently-commissioned additions to its container fleet with General Electric Credit Corporation.

The two ships—American Apollo and American Aquarius—were financed under "first preferred mortgages" totaling $15 million. The ships are of the "Lancer" class, capable of carrying 1,200 highway-trailer-type containers each at a cruising speed of 23 knots. The loan was also said to be extraordinary in that it covers ships in commission.

The firm of Lehman Bros., Incorporated of New York, N.Y. were investment bankers in the transaction. The ships were built by Sun Shipbuilding and Dry Dock Co., Chester, Pa.

General Electric Credit Corporation implemented the loan via its Leasing and Industrial Loan organization, the group within the $2-billion-per-year sales financing company that is charged with major lending and leasing transactions in transportation and industrial equipment.

Both ships are a part of United States Lines' "Sea Bridge" containerized service linking East and West Coasts of the United States, Europe, Hawaii, and the Far East with weekly sailings of 16 fast containerships of the Lancer and Leader classes.

The American Apollo made her maiden voyage October 13, 1970, within a month of the launching of the Far Eastern service. The American Aquarius made her maiden voyage March 8, 1971, and is the 16th ship in the line's container fleet, which is the largest of new containerships now in service.

Bailey Names Melick Manager, Staff Services

L.L. Melick

J.H. Dennis, president of Bailey Meter Company, Wickliffe, Ohio, has announced the appointment of **L.L. Melick** as manager of staff services. Mr. **Melick** will report directly to Mr. **Dennis.**

Mr. **Melick** succeeds **L.F. Richardson,** who is retiring. As manager of staff services, Mr. **Melick** will be responsible for the personnel, patent, office services, advertising and sales promotion, and public relations functions.

Since 1966, Mr. **Melick** has been general manager of Belfab/Bailey Meter Company, a manufacturer of custom welded metal bellows. He joined Bailey in 1940, after earning his B.S.E.E. degree from Case Institute of Technology. His experience includes management of several engineering and service departments prior to his appointment to Belfab.

In September 1958, Mr. **Melick** was granted a 10-month leave of absence from Bailey to serve the Government in Washington, D.C., as the industry advisor for the instrument industry in the Business and Defense Services Administration of the Department of Commerce.

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

A.P. St. Phillip Gets Tentative Approval For Mortgage & Loan Ins.

A.P. St. Phillip Inc., Tampa, Fla., has obtained tentative approval for mortgage and loan insurance to help finance a $5.5 million tug-barge unit to haul petroleum products from Texas and Louisiana refineries to Florida ports.

The barge was said to be of 33,000 deadweight tons and, according to the Maritime Administration, was to be owned jointly by A.P. St. Phillip and the Florida Storage and Pipeline Corp.

Newport News Ship Names William Warren

William H. Warren

William H. Warren has been named director of labor relations for Newport News Shipbuilding, according to **D. Boyd Thomas,** director of personnel and industrial relations for the Tenneco company.

Mr. **Warren** will report to Mr. **Thomas** and will work in the area of labor contract negotiations, employee grievance administration, and coordination of provisions of current and subsequent labor agreements with company policies and practices.

A Newport News native, Mr. **Warren** is a 1942 graduate of Newport News High School. He attended the shipyard Apprentice School as an apprentice machinist until his enlistment in the Navy in 1943. After three years in the Pacific, he was released to inactive duty as a machinist mate first class. He remained an active naval reservist until 1954, when he was discharged as a lieutenant in the Supply Corps.

A graduate of the University of Richmond, Mr. **Warren** also attended Purdue University and holds advanced degrees from that institution. Since 1966, Mr. **Warren** has held teaching positions at Purdue and the College of William and Mary and has also served as a management consultant in the labor relations field.

His father was a pilot in the Virginia Pilot Association and his paternal grandfather was captain of the old C&O steamer Virginia. Mr. **Warren's** maternal grandfather was **Ben Cofer,** who for many years operated Cofer's Cigar Store, a former city landmark near the shipyard.

Landry To Manage Furness Withy Office In Houston, Texas

Francis J. Landry has been appointed manager of Furness, Withy & Company, Ltd.'s Houston office, it was announced by **Clifford J. Smith,** executive vice president of the firm.

Mr. **Landry** brings with him 20 years of shipping experience, the last 12 years in the port of Houston. He will be responsible for Furness, Withy's activities in the Greater Houston area. **Francis X. Mayville** will continue as assistant manager and **R.F.J. Dixon** as wharf superintendent of the Houston operation.

Management Changes At Fluor Drilling

Ross A. McClintock, president of Fluor Drilling Services, Inc., has announced several management changes in the Fluor Corporation subsidiary. **Howell T. Hunt,** former vice president and general manager of the company's WODECO Division, has been named vice president, international sales, for Fluor Drilling Services. He is succeeded at WODECO Division by **Robert F. Woidneck,** formerly WODECO's vice president, operations. Mr. **Woidneck** is succeeded by **Edgar D. Turner,** who was formerly manager of operations.

Mr. **Hunt,** a civil engineering graduate of Georgia School of Technology, has had more than 20 years of experience in engineering-construction and drilling services to the petroleum industry. He joined WODECO in 1963.

Mr. **Woidneck** is an engineering graduate of the University of Southern California. He spent 10 years with a major oil company before joining WODECO in 1962.

Mr. **Turner** joined WODECO in 1967. Prior to that time, he was employed as an engineer by a major oil company. He is a graduate of Colorado School of Mines, with a degree in petroleum engineering.

S.F. Marine Exchange Elects Five Executives

Five Pacific Coast industry leaders have been elected to direct the activities of the 122-year-old Marine Exchange of the San Francisco Bay Region.

Selected by 500 members to serve as board members for three years are: **Worth B. Fowler,** president of American President Lines, Ltd.; **Jorgen Fredrikson,** vice president of East Asiatic Company, Inc.; **John Hays,** partner of Dorr, Cooper and Hays, admiralty attorneys; **Frank D. Troxel,** president of Seatrain Lines, California, and **Miss Miriam Wolff,** port director, San Francisco Port Commission.

Founded in 1849 to herald the arrival of Gold Rush-bound clipper ships, the Marine Exchange has since kept continuous watch on the Golden Gate, providing the "pocketful of ports" with its shipping intelligence and a variety of related services. Its leadership resulted in location at its Fisherman's Wharf station of the Coast Guard's first harbor advisory radar service. Also stemming from such initiation (in 1959), the U.S. Government launched what is now an all-out campaign against shipping "red tape."

The new directors will help direct new programs, including expansion of UHF shoreside communications for Government officials and industry, promotion efforts to expand local commerce, and programs to enhance regional navigational safety.

Italian Line Chief Joins N.Y.C. Port Council

Tomaso Busso

Tomaso Busso, general manager of the Italian Line for North America, has been named a member of the New York Council on Port Development and Promotion, it was announced by **Ronald Javello,** executive director.

Mr. **Busso** is the 25th member to join the N.Y.C. Council, which is dedicated to the protection and advancement of shipping through the New York City waterfront. The members represent all branches of the maritime industry—foreign trade, freight forwarding, transportation and labor.

Mr. **Busso,** a native of Turin, has been involved in the shipping industry for 25 years, having held responsible positions throughout Europe. He was appointed to his present post in 1970.

Alpha Engineers Named North American Rep For Galinet S.A.

Alpha Engineers, 312 Edwards Lane, Vancouver, Wash. 98661, the sales and service oriented group of registered professional mechanical engineers, naval architects and practical mechanics, have been appointed exclusive representatives in all of North America by Galinet S.A. of Limoges, France, the half-century experienced builders of winches, hoists, pile drivers and related equipment for marine, mining, oil field and other applications.

In addition to its standardized lines, Galinet builds many custom units to meet the special requirements encountered in many of its worldwide installations.

Enjay Chemical Names L.O. Smith Savannah, Ga. Agent

Enjay Chemical Company has announced the recent appointment of **L.O. Smith** as agent for Industrial and Marine Coatings and Marine Cleaners in the Savannah, Ga. area.

Leonard Smith, head of the firm, stated the complete line of Rust Ban paints and Marine Cleaners will be stocked in their warehouse at 200 West Bay Street, Savannah, Ga.

MSC To Seek Offers From U.S. Shipowners To Charter 10 Vessels

Offers from U.S. shipowners to charter 10 special-type vessels to be the new supply backbone of the Defense Department's ocean supply fleet is shortly expected to be sought by the Military Sealift Command. MSC is currently deciding whether to make one 10-ship blanket request or to divide it into two separate bids. Vice Adm. **Arthur R. Gralla,** Commander of MSC, recently stated that the LASH vessels, sea barges and OBOs that are to be built under the new maritime program "can fulfill a portion of our sealift requirements."

$1 Million Order In Nuclear Equipment To Western Gear

Western Gear Corporation has been selected by the General Electric Company to manufacture reactor servicing equipment under a contract valued in excess of one million dollars.

Western Gear has formed a nuclear group at its Lynwood, Calif., headquarters to handle the new product line of reactor servicing equipment. Manager of the nuclear group is **Martin L. Headman,** previously director of research for Western Gear.

Dredging Conference To Be Held Dec. 1-3 In New Orleans, La.

"A Salute To The Dredging & Marine Construction Industry Of North America," has been announced as the theme for the Fourth World Dredging Conference (WODCON IV) by the directors of the association. Scheduled to be held in New Orleans, December 1-3, 1971, the World Dredging Conference has completed a full global circuit. Held every 18 months, the conference had its first meeting at the New York Coliseum in 1967, then Rotterdam in 1968, and Singapore in 1970. WODCON is sponsored by the industry association bearing its name, comprising leading dredging industry firms from 20 countries, plus the technical society World Dredging Association, with individual members in over 35 countries.

WODCON IV has chosen this theme to focus upon, and give recognition to, the contribution that industry has made in the past to the economic development of North America. It will also emphasize the role of dredging in the future development of the coastal and inland waterway resources.

With national concern being shown for the protection of the environment, the conference will draw public attention to the interest and capability of the marine construction industry—which includes dredging—as a whole, to play an active role in preserving and cleaning up the marine areas of this continent. It will demonstrate the fact that while altering the environment through keeping channels clear and creating useful land, a simultaneous program will be instituted to protect or enhance the natural ecology.

The various state, regional and national Government agencies concerned with coastal and inland waterways, are being invited to participate in this important affair. Attendance will be open to the general public and allied industry. For information, contact WODCON, P.O. Box 20810, Long Beach, Calif. 90801.

Roen Salvage Co. Appoints R.F. Pesch

Charles Asher, president of the Roen Salvage Company, marine contractors of Sturgeon Bay, Wis., has announced the appointment of **Raymond F. Pesch** to the position of vice president and general manager of the company.

Mr. **Pesch** has been with Roen Salvage since January 1957, serving as chief engineer in charge of all engineering, estimating and field operations of the company. Before joining Roen Salvage, Mr. **Pesch** was with the U.S. Corps of Engineers, Operations Division of the Milwaukee District, for 19 years. He is a 1937 graduate of Marquette University, with a bachelor of science degree in civil engineering, and is a registered professional engineer in the state of Wisconsin.

Astilleros Espanoles Launches First Of Two Innovative Tankers

The Conoco Espana

This 115,000-Dwt Tanker Incorporates The Free-Flow Cargo System, Crude-Oil Burning Diesel And Offshore Mooring And Discharge System To Streamline Operations.

The first of two innovative new oil tankers under construction in the yard of Astilleros Espanoles, S.A., Cadiz, Spain, for Continental Oil Company was launched on April 23. **Mrs. John G. McLean,** whose husband is president and chief executive officer of the Continental Oil Company, christened the new 115,000-dwt vessel Conoco Espana. The tanker's sister ship, the Conoco Britannia, is scheduled for launching in September.

When these two new ships enter service, they will, in effect, be key elements in a modern, integrated system of transportation which uses original concepts in the long-range delivery of petroleum products.

Each vessel is 905 feet long. They have a breadth of 137 feet and a loaded draft of 50 feet. The cargo capacity is 896,000 barrels.

The Conoco Espana and Conoco Britannia will achieve several "firsts" in maritime tanker history. The owners feel that the new features incorporated in their design make the vessels more technically advanced than any currently in service for the transport of petroleum.

One of the innovations aboard the ships is that the fuel they burn will be crude oil, pumped into their bunker tanks at the same time their cargo of crude oil is loaded. They will be the first crude-burning diesel ships in service. Each ship will be powered by a single Sulzer 8RND90 23,200-bhp diesel engine driving a controllable-pitch propeller. This power plant will give the ships a service speed of 16 knots.

Conoco has run extensive tests in the shops of the engine manufacturer in Switzerland and learned that crude oil out-performs conventional fuels in several respects, in addition to providing logistic savings. The company believes that further development of the unique crude-burning system is possible and can also lead to licensing of a number of patents which have been issued during the development phase.

These two tankers also will be the first tankers in operation specifically designed for bow loading and discharge. Conventional tankers have their cargo manifolds located in the midship area; but since the new Conoco vessels will load and unload at single-point mooring buoys in North Africa and Europe, they will have the capability of accepting cargo-handling hoses through the forward end.

This system will reduce the time required to connect and disconnect loading lines. Forward loading and discharge can lead eventually to shorter cargo hoses as more operators adopt such a system. In addition to a reduced initial investment, the possibility of damage or ordinary wear-and-tear on the tankers as they come alongside will be decreased.

Internal ship design utilizes the Conoco free-flow system of loading and discharging, eliminating all cargo pipes in tanks and permitting a 10,000-ton-per-hour discharge rate. All cargo tanks will be fully coated with a corrosion-resistant epoxy paint system. In addition, specifications include special pollution control and safety equipment, such as quick cargo-tank washing systems, slop-oil settling tanks, and steam-driven tank gas-freeing devices, permitting fast removal of gases and vapors. Automated control devices will be installed to allow the master complete bridge command during maneuvering.

Conoco Espana launching party, left to right: **John G. McLean,** president and chief executive officer of Continental Oil Company; **Luis Nadal,** director general of Astilleros Espanoles; **Senora Nadal,** and **Mrs. John G. McLean,** sponsor of this innovative ship.

These vessels also will have the first bow thrusters to be installed aboard ships of this size. These devices will reduce the time required to moor, and will also enable them to avoid damage to themselves and the buoys and hoses from accidental contact.

The two ships will have helicopter pads which will permit embarkation and disembarkation of personnel, documents, provisions and equipment under sea conditions which might prevent launches from going out. The vessels will be loaded and discharged offshore and will go alongside wharves and quays only for emergency and annual repairs.

Continental Oil Company recently placed in service the first offshore mooring monobuoy in Great Britain. The firm also has monobuoys off the coasts of Libya and the Shaikhdom of Dubai, permitting company vessels to load and unload without entering a harbor at either end of their voyages. The new $16,800,000 facility at Tetney, England, consists of a 120-ton monobuoy connected by a five-mile pipeline to a 40-million gallon storage complex.

The combination of large, shallow-draft vessels, the new process for utilizing crude oil as tanker fuel, and an offshore mooring and discharge system will streamline crude transportation, speed tanker turnaround in port areas and eliminate delays due to cargo trans-shipment at European or United Kingdom ports.

The shipyard which is building these tankers, Astilleros Espanoles, S.A., has been constructing tankers since 1930. Some 17 tankers have been built since then, ranging from 8,500 dwt at first, to as high as 151,000 dwt. At the present time, the shipbuilding company has orders for five tankers of the 230,000-dwt class.

Conoco Espana, the first of two 115,000-dwt tankers for Continental Oil Company is shown above just prior to launching at Astilleros Espanoles, S.A., Cadiz, Spain, in April of this year.

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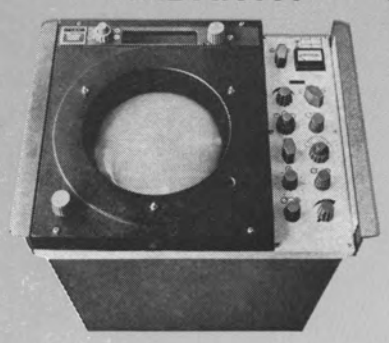

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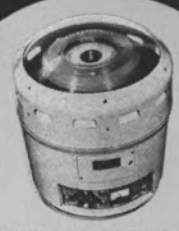

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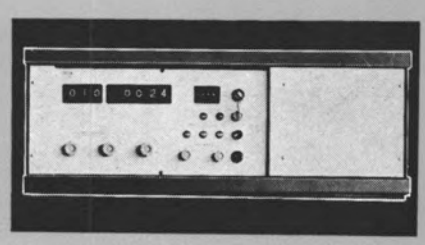

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TURBO GENERATOR SETS

1 

WESTINGHOUSE
440/3/60
200 KW UNIT

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

2 

WESTINGHOUSE
60 KW 120 VDC
M-20-EH

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

3 

300 KW
WORTHINGTON-MOORE
CROCKER-WHEELER
UNITS

AP2 Ex-Medina Victory units. Worthington-Moore turbine—440 lbs—740°TT—28½" vac.—type S4—5-stage—6097 RPM—serial 7647 & 7548. GEAR: 14x7—6097/1200. GENERATOR: Crocker-Wheeler 300 KW 120/240 DC—1250 amps—type 102-H—compound—973643—999759—armature flange 8¼"—bolt circle 7"—12 holes. Also new armature in stock (weighs 1840 lbs). Also have 2 units—generator 102 HP—300 KW—120/240—stab. shunt—1200 RPM.

4

VICTORY 300 KW
WESTINGHOUSE TURBO
GENERATOR SET

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

5 

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

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

DIESEL GENERATOR SETS

6 

G.M. 6-71 DIESEL
GENERATOR SET

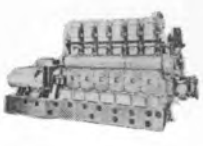
60 KW — 440/3/60 — 1200 RPM—with switchgear.

7 

350 KW 120/240 VDC
DIESEL GENERATOR SET

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

250 KW DIESEL
GENERATOR SET

8 

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 switchgear.

$12,500.

9 

UNUSED 500
KW 120/240 VDC
BALDWIN/ALLIS
CHALMERS DIESEL
GENERATOR SET

ENGINE: Baldwin-DeLaverne 725 HP—12¾"x15½"—8 cyl.—500 RPM—air starting. Dry weight 54050 lbs. GENERATOR: Allis-Chalmers 500 KW—120/240 VDC—500 RPM—550 RPM overspeed. 60°C rise—class B insulation—3-wire—25% unbalance—2083 amps—stab. shunt—open—drip-proof—self-ventilated—8-poles.

10 

UNUSED 100KW
SUPERIOR DIESEL
GENERATOR SET

GENERATOR: 120/240 VDC—417 amps—stab. shunt—1200 RPM. DIESEL: Superior GBD-8—8 cyl.—5½x7.

11 

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.

TURBINE ROTORS

MAIN PROPULSION

12 

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.

13

SPECIAL!

COMPLETE TURBINE
OR ROTORS

8500 HP G.E. C-3 Victory—Sun C-4's.

L.P.—Serial 77943 H.P. Serial 77942
G.E.I. 16263

14 NEW L.P. BLADE RINGS
for large 8500 H.P. Victory

Joshua Hendy Westinghouse

15

NEW 8500 H.P.
G.E. TURBINES

Large Victory or C-3

H.P. #72271 L.P. 72272

10 BOXES SPARE PARTS, TOOLS & FITTINGS. WITH MANEUVERING VALVES.

ALSO AVAILABLE

16

U.S.M.C.
RECONDITIONED SET
H.P. & L.P.

With 13 boxes spare parts. H.P. 77994—L.P. 77987—with maneuvering valves.

17 8500 H.P. G.E. — C-3 OR VICTORY

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

18 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

19 VICTORY SHIP AP2 H.P. & L.P. TURBINES
NEW — UNUSED — 6000 HP SETS

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

AUX. GEN. ROTORS

20 250 KW & 300 KW
ALLIS-CHALMERS ROTORS

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

21 300 KW 5965 RPM JOSHUA HENDY

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

T-2 ROTORS, STATORS COOLERS, ETC.

22 ELLIOTT 10-STAGE MAIN PROPULSION
TURBINE ROTOR

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

23 

LARGE G.E.
MAIN PROPULSION
SCHENECTADY
TURBINE ROTOR

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

AUXILIARY GENERATOR ROTORS

24 

DORV—325M—T-2 Tanker Aux. Generator.

25 

WESTINGHOUSE
MAIN PROPULSION
REVOLVING FIELD

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

26 

WESTINGHOUSE
MAIN GENERATOR
STATOR

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

27 

G.E.
MAIN GENERATOR
STATOR

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

28 

WESTINGHOUSE
MAIN GENERATOR
AIR COOLER

Reconditioned with A.B.S.

29 UNUSED G.E. MAIN GENERATOR
AIR COOLER

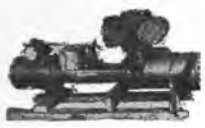
PUMPS

30 

VICTORY AP2 MAIN
CIRCULATOR

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

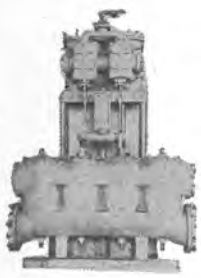
31



UNUSED 10x9x12 VERTICAL SIMPLEX FUEL OIL TRANSFER PUMPS

Furnished on some T-2 Tankers. 160 GPM Bunker C —viscosity 70 to 700 SSF 122°F @ 100 lbs. discharge pressure. WP steam 150 lbs.—exhaust 10 lbs. 1¼" steam inlet—1½" exhaust. 4" Pump suction—3½" discharge.

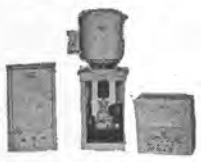
32



WORTHINGTON 16"x14"x18" VERTICAL DUPLEX STRIPPING PUMP

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

33



NEW BLACKMER FUEL OIL TRANSFER PUMP

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

34

UNUSED BLACKMER VERTICAL ROTARY PUMP

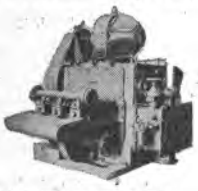
4"—100 GPM—100 PSI—15 HP — 440/3/60 — gear head.

35

R-2418 WATEROUS CARGO PUMP

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

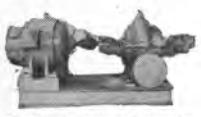
36



UNUSED BOILER FEED PUMP

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

37



UNUSED WARREN BRONZE PUMP

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

38

NEW WORTHINGTON VERTICAL SUBMERSIBLE BILGE PUMP

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

39

NEW—UNUSED BRONZE VERTICAL LST BALLAST PUMP

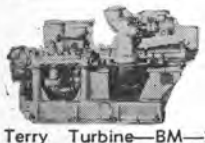
1500 GPM—56' head or 25 lbs. — 8" suction — 6" discharge. MOTOR: Century 30 HP—230 VDC—110 amps—1750 RPM — 40°T rise — stab. shunt—BB drip proof —controls available.

40

EXCELSIOR MOLASSES PUMP—SIZE 5½"

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

41



UNUSED SIZE 4 BUFFALO FEED PUMPS

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

42

COFFIN MODEL F BOILER FEED PUMP—VICTORY OR T2

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

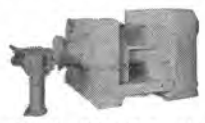
43

BRONZE 14x14x12 CARGO STRIPPING PUMPS

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

WINCHES AND WINDLASSES

44



VICTORY UNIT WINCHES

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

45

MODEL U-6 DOUBLE DRUM WINCHES WITH GYPSIES

50 HP—230 VDC—reconditioned.

46

HYDE NO. 7 WINDLASS

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

47

NEW—UNUSED LINK BELT WINDLASS

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

48

IDEAL WINDLASS—UNUSED

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

49

UNUSED 70 HP McKIERNAN-TERRY WINDLASSES

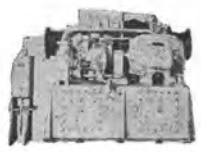
2¾" Chain and two 10640 lb. anchor & 30 fathoms chain @ 30 FPM. 70 HP—230 volts—shunt DC motors—233 amps—550 RPM—55°C rise. Wildcat centers 47½". Base 9'5" wide x 11' long. Weight 36,000 lbs.

50

LCT-6 JAEGER GASOLINE DRIVEN WINCH

With torque converter & free declutchable drum, 31,000 lbs. @ 6 FPM or 3000 lbs. & 350 FPM. DRUM: 20"x23¾"x37½". GYPSY: 15"x13". Twin Disc torque converter—6 cyl. Hercules gas engine model WXLC-3. Total weight approx. 4500 lbs.—serial 81843.

51



4 SINGLE DRUM ELECTRIC HYDRAULIC WINCHES

From Navy Research Ship Liberty AGTR-5. Like new. Mfg. by Lakeshore Engineering Co. Gypsy heads can be operated separately from drum. 7400 lbs. @ 220 FPM; 624 ft. of ¾" rope in 5 layers. Total weight of winch, motor & pump 7221 lbs. OAW 84¼"; OAL 88"; OAH 58". With remote control stands.

MISCELLANEOUS

52

VICTORY AP2—WESTINGHOUSE MAIN PROPULSION GEAR

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

53

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

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

54

1 PAIR OF 300 HP UNION DIESEL ENGINES

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

55

MODEL O-2-D M&T RECONDITIONED UNITS

Hydraulic starting, steering, raising & lowering tailfin. Navy reconditioned 1965—fully checked out by us. Will demonstrate running. Wt. about 9500 lbs. PROPELLOR: 48"x24"—3-blade.

56

HYDE 30" DOCK CAPSTAN

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

57

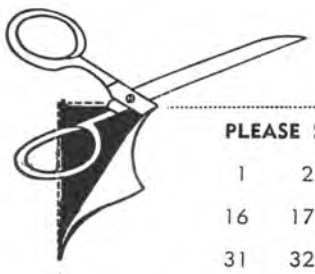
DOUBLE INPUT—SINGLE OUTPUT DIESEL REDUCTION GEARS

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

58

INGERSOLL-RAND MODEL 40 AIR COMPRESSOR

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



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31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58		

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

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

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

Catamarizing The M/V Island Princess

John Case and **Peter Hart** of Case Existological Laboratories Ltd., examining a model of the catamaran. Dark areas show existing hull(s).

The British Columbia ferry M/V Island Princess was delivered to Burrard Dry Dock, North Vancouver, earlier this year for a major conversion in which the existing mono-hulled vessel will be rebuilt in the form of a twin-hulled vessel of the catamaran type.

The vessel was built by Allied Shipbuilders of North Vancouver in 1958 and has served Northern Vancouver Island for many years, but due to the demands of the developing area, an increased ferry capacity is desirable.

A contract was let by the British Columbia Ferries to Case Existological Laboratories Ltd. of Victoria, B.C., Canada, in 1970, to study the feasibility of increasing the carrying capacity of the vessel, and to provide unrestricted roll-on/roll-off loading facilities. It was determined that the desired increase in carrying capacity could not be achieved by lengthening alone, due to difficulties with stability and trim. It was, however, apparent to C.E.L.L. that if the vessel could be cut along the fore and aft centerline and widened to form a catamaran-type vessel, the problem would be solved. It has long been recognized that the catamaran has distinct advantages for vehicular ferries, due to the high ratio of available deck area to displacement.

At the end of July 1970, C.E.L.L. proceeded on the design and full working drawings to convert the Island Princess to a twin-hulled vessel with hull separation, inside to inside of 22 feet 6 inches, lengthening the vessel approximately midships by 35 feet, with an additional 13 feet 6 inches added to the stern sections to compensate for trim.

The new wing structure, 31-inches deep at amidships, extends the full 57-foot beam of the catamaran and is superimposed upon the separate hulls. Structural continuity is established with new transverse webs built into the original hull structure.

Tank tests for the twin-hulled vessel were carried out by the British Hovercraft Corporation to determine resistance and propulsion characteristics, with further tests to determine the response characteristics and accelerations sustained in irregular head seas and regular beams seas.

C.E.L.L. has worked closely throughout the project with **W.B. Weston,** operations manager, B.C. Ferries, and **E.W. Phillips,** construction supervisor, B.C. Ferries.

In the converted vessel, the port-side hull has a steering gear compartment, engine room, auxiliary engine room, crew accommodation and void spaces. The starboard side hull is similar and includes a storeroom.

Twin casings house public and crew washrooms, storerooms, stairways to lower accommodation and to the sun deck located approximately 16 feet above the main deck. Midway between the sun deck and main deck, on the outboard side of each casing, are fitted the ship's lifeboats and inflatable life rafts.

The sun deck features all new lounge and cafeteria areas with food preparation, galley storeroom and crew mess room. Above the sun deck is the bridge deck, with officers' accommodation, and the navigating bridge deck.

The finished vessel will include all new crew accommodation and furnishings, new lounge and mess room furniture and cafeteria equipment, new hot water heating system, new auxiliary and engine room CO_2 total flooding system, new cathelco system, new gyro-compass, and an additional radar set.

To match this novel idea, the word catamarizing has been coined by C.E.L.L. The cost of this conversion is $940,726, while a new vessel of this size would cost over 2¼-million dollars.

Comparison Data

	Before Conversion	After Conversion
Length, Waterline	125'-0"	173'-6"
Breadth, Molded	34'-6"	57'-0"
Loaded Displacement	422 Tons	720 Tons
Auto Capacity (17'-6" x 6'-6")	20	49

Lykes-Youngstown Elects Four Officers To Corporation Board

The board of directors of Lykes-Youngstown Corporation announced the election of four subsidiary company officers to the board of the corporation. They are **W. James Amoss Jr.,** executive vice president, Lykes Bros. Steamship Co., Inc.; **Thomas A. Cleary Jr.,** senior vice president, operations; **Jennings R. Lambeth,** senior vice president, marketing, and **R.C. Rieder,** senior vice president, manufacturing, all of Youngstown Sheet and Tube Company.

Mr. **Amoss,** who joined the steamship company in 1947 after service with the U.S. Navy in World War II, was elected to his present position in January of 1970. In the ensuing years after joining the company, he held various offices in Lykes's Traffic and Operating Divisions before being transferred abroad in 1953. In 1959, he was named Lykes's Continental director in charge of European operations, where he served until 1963, when he was named senior traffic officer.

Mr. **Cleary** has been with Youngstown Sheet and Tube Company since 1943. By 1955, after having served in the U.S. Navy during both World War II and Korea, he had advanced to junior melter in the company's steelmaking department. Subsequently, he advanced through many operating management positions to his present position as senior vice president, operations. He has held this office since February 1971.

Mr. **Lambeth** joined the steelmaking subsidiary in 1961 as manager of steel service center sales after 15 years of steel selling experience. After military service in World War II, he joined W.J. Holliday & Company of Indianapolis and later joined Jones and Laughlin Steel Corporation, which purchased the Holliday firm in 1955. He advanced through several sales and marketing positions at Youngstown and was elected to his most recent position as senior vice president, marketing, in February of this year.

Mr. **Rieder** joined Youngstown's Continental-Emsco Division, a manufacturing and marketing supplier to the oil and gas industries, in 1961 as vice president, manufacturing and engineering. He advanced to president of Continental-Emsco and vice president of Youngstown in 1964. In February of this year, he was elected senior vice president, manufacturing.

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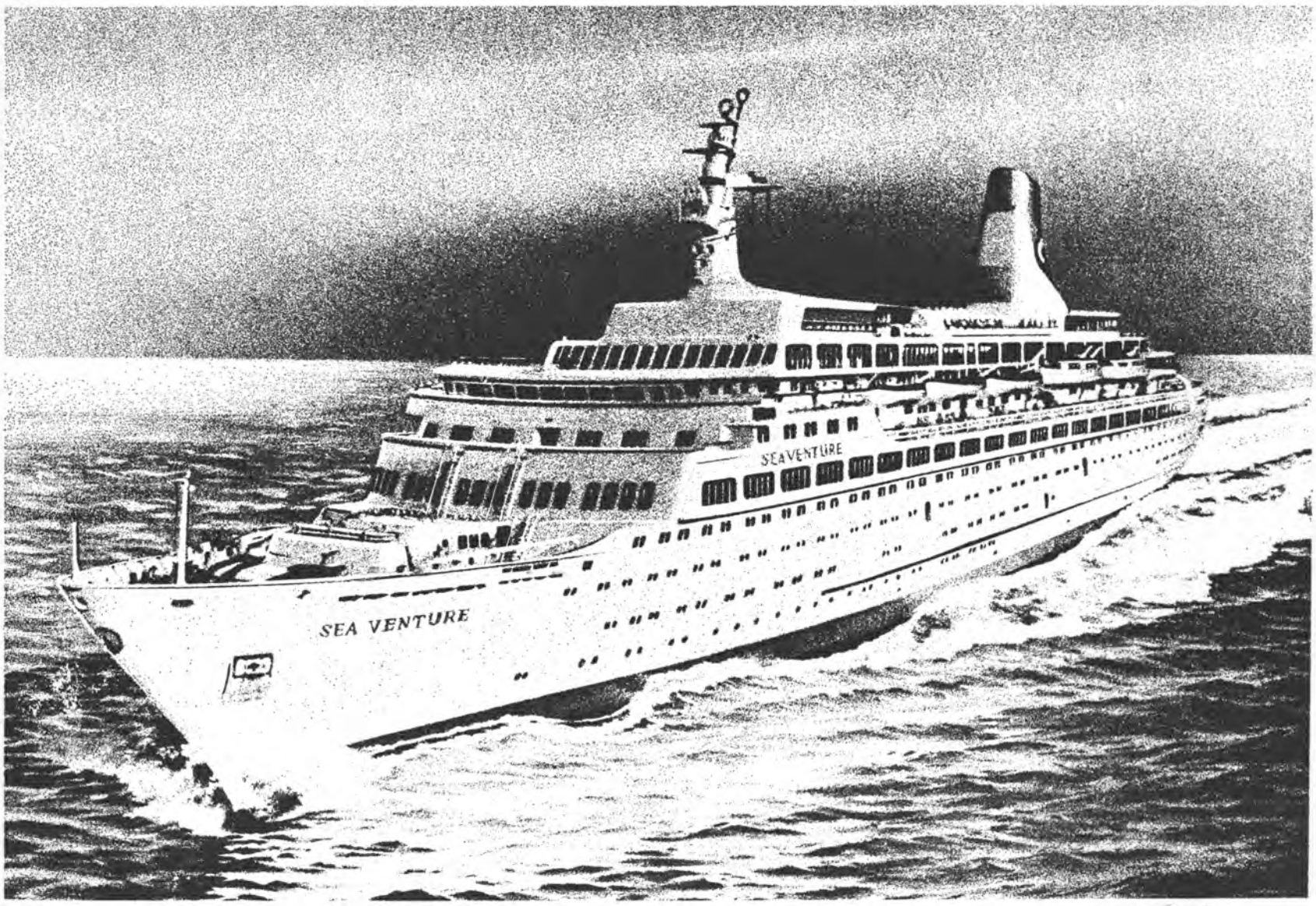

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Manitowoc Moves Shipbuilding Facilities To Bay Shipbuilding In Sturgeon Bay, Wisconsin

Manitowoc Shipbuilding, Inc., Manitowoc, Wis., after nearly 70 years of shipbuilding and ship repairing in Manitowoc, will move its facilities to Sturgeon Bay, Wis. Completing the wood passenger vessel Chequamegon in 1902, Manitowoc has continuously produced quality ships of all types, both for Great Lakes and ocean service.

The decision to move was predicated on expansion requirements of the shipyard and its sister company, Manitowoc Engineering Co., and also limitations in water access for berthing larger vessels in Manitowoc. Existing berths in the Manitowoc shipyard area will remain available for winter fleet tie-up. Services and supplies will be available to vessels laid up during the winter months for normal maintenance and repairs.

In 1968, Manitowoc purchased the Sturgeon Bay Shipbuilding and Drydock Company's real estate and equipment. Operation continued under the new name, Bay Shipbuilding Corp., a subsidiary of Manitowoc Shipbuilding, Inc. In 1970, the real estate of the Christy Corporation was acquired. These two yards, comprising 36 acres of land, will provide berths for 14 ships.

The move is scheduled to take place in the next 60 days. During this time, Manitowoc's floating drydock will be disassembled and towed to Sturgeon Bay. The move will also include machinery, tools, storeroom supplies, staging, shipyard cranes and other material handling equipment. Fifteen of Manitowoc's key management, engineering and foreman personnel will move to Sturgeon Bay to supplement the existing supervisory forces. Because of the drydock relocation, the company will not be in a position to accept dockings during the above mentioned period. The graving dock will remain in operation.

The new shipyard facility will operate under the name of Bay Shipbuilding Corp., and **John D. West,** president of the parent company, The Manitowoc Co., Inc., is chief executive officer. Other officers are: **A.J. Zuehlke,** president; **L. Spude,** executive vice president and general manager; **H.V. Skatrud,** assistant general manager; **R.H. Miller,** director of engineering; **C.A. Shaw,** finance, and **N. Urban,** manager of purchases.

A complete modernization program has already been started with the construction of new office and shop buildings, steel bulkheaded docks, dredging and the purchasing of new machinery and equipment.

Escort Ship Donald B. Beary Fifteenth In A Series Of 27 Launched At Avondale Yard

Principals of the Donald B. Beary launching are from left to right: Rear Adm. **Charles N. Payne,** USN, Supervisor of Shipbuilding, Conversion and Repair, Pascagoula, Miss.; **Mrs. Donald B. Beary,** sponsor; **Clarence L. Geier,** vice president and general manager, Harvey Repair Division, Avondale Shipyards, Inc., and the Honorable **Speedy O. Long,** House of Representatives, Washington, D.C., principal speaker.

The Donald B. Beary (DE 1085), an escort ship of a new class and the 15th of 27 DEs being built by Avondale Shipyards, Inc., New Orleans, La., was recently launched at Avondale's main yard.

Sponsor of the vessel was **Mrs. Donald B. Beary,** widow of Vice Adm. **Donald B. Beary** for whom the ship is named. Principals of the launching included Capt. **R.J. Leuschner,** USN, Supervisor of Shipbuilding, Conversion and Repair, 8th Naval District; Rear Adm. **Charles N. Payne,** USN, Supervisor of Shipbuilding, Conversion and Repair, Pascagoula, Miss.; **Clarence L. Geier,** vice president and general manager, Harvey Repair Division, Avondale Shipyards, Inc., and, as principal speaker, the Honorable **Speedy O. Long,** House of Representatives, Washington, D.C.

The Donald B. Beary (DE 1085), built under the multiple year procurement contracts awarded in 1964 and 1966, is designed for optimum performance in locating and destroying submarines. Integral bow-mounted long-range sonar, variable depth sonar, and gyro-stabilizers provide for improved seaworthiness and increased antisubmarine warfare capabilities over previous DEs. The new escort ship is 438 feet in length with a beam of 47 feet, and is capable of attaining speeds in excess of 25 knots. Her total complement consists of 19 officers and 266 men.

Vice Adm. **Donald B. Beary,** USN, was largely responsible for the revolutionary success of mobile underway replenishment leading to victory in the Pacific during World War II.

IRD Mechanalysis Announces New Vibration Monitor-Recorder

IRD Mechanalysis, Inc. has announced a new Portable Vibration Monitor-Recorder that provides protection against serious machinery damage during critical periods, such as start-up and other speed or load changes.

The Series 1250 Portable Multichannel Vibration Monitor-Recorder is a valuable tool in evaluating the need for permanent monitors to protect critical machines and processes. Ideally suited for field service and installation checkout of new equipment, it can be moved quickly and easily. A convenient jack permits a Mechanalysis vibration analyzer to be connected for vibration analysis and in-place balancing.

When a machine's vibration exceeds the pre-set "warning" level, monitor light goes on and the annunciator is triggered. "Warning" and "shutdown" alarm signals are available at barrier terminal strip to activate a remote alarm system.

The Recorder provides a permanent record of developing mechanical defects which may occur during periods while the monitor is unattended. Each pickup point is easily identified on the standard 1"/hour chart paper. The Monitor-Recorder system consists of a standard Mechanalysis Vibration Monitor, Scanner, Recorder and Vibration Pickups housed in a rugged carrying case.

For more information, write to IRD Mechanalysis, Inc., 6150 Huntley Road, Columbus, Ohio 43229.

Jacksonville Shipyards To Build Hydraulic Pipeline Dredge

Ellicott Machine Corp., Baltimore, Md., has signed a contract with Jacksonville Shipyards, Inc., Jacksonville, Fla. 32203, for the building of a hydraulic pipeline dredge that was designed and engineered by Ellicott.

Mexican Ministry Of Marine Installing Syncrolift Dock

An important expansion to the ship repair facilities at the Salina Cruz Dockyard of the Mexican Ministry of Marine, a new Syncrolift marine drydock of 2,550 tons lifting capacity, is being built under the special survey of Lloyd's Register of Shipping with a view to being classed +A "Mechanical Lift Dock."

The principal dimensions of the dock are, approximately: length, 328 feet, breadth, 72 feet, and draft over blocks, 16 feet. The civil engineering construction, contracted with a local Mexican company, has already been commenced. The grillage platform will be built in the Salina Cruz Dockyard from steel supplied by Altos Hornos de Mexico, S.A.

The electrical equipment and wire ropes are being supplied by Pearlson Engineering Co. Inc., the Syncrolift patentees, through various U.S.A. manufacturers, and the Clark Chapman Group in the U.K. are building the twenty-eight 180-ton winches.

Located in the Gulf of Tehuantepec on the Mexican Pacific Coast, this Government dockyard occupies a strategic position between San Diego, Calif., and Balboa, Panama, and is available and equipped for all types of ship and machinery repairs.

The new Syncrolift installation will augment the facilities provided by the existing graving dock and is expected to be fully completed, classed with Lloyd's Register and ready for operation within the first half of 1972.

The Port Everglades, Fla., 4,270-ton lifting capacity Syncrolift is also classed with the Society and plans for many other Syncrolift docks have been approved, including those at Halifax, Nova Scotia, and Vancouver, British Columbia.

Hillman Barge & Construction Appoints Singleton And Turner

Ira J. Singleton Jr.

Stephen H. Turner Jr.

Ira J. Singleton Jr. has been appointed assistant general manager, and **Stephen H. Turner Jr.** has been named assistant chief engineer for Hillman Barge & Construction Company, Brownsville, Pa., as announced by **Bernard T. Kelley,** vice president and general manager.

Mr. **Singleton** is a graduate of California State College and the University of Pittsburgh. He started with Hillman in 1951 and has progressively served as chief draftsman, assistant chief engineer and, since 1965, as chief engineer.

Mr. **Turner** joined Hillman in 1970 as a design engineer. A native of Dayton, Ohio, he is a graduate of the University of Cincinnati. Previous to coming with Hillman, he was an engineer with Dravo Corporation's marine department.

Marine Industries To Build Multipurpose Containerships For Two French Operators

Twelve multipurpose containerships of about 15,600 displacement tons each will be built by Marine Industries, Ltd., Montreal, Quebec, for two Paris shipping companies—La Compagnie Maritime des Chargeurs Reunis and La Societe Navale Chargeurs Delmas-Vieljeux. The contract, estimated to be $123 million, was made possible by a $21-million subsidy provided by the Canadian Government. Also, of the actual price of $102 million to the two companies, $82 million was financed by low-cost loans from Canada's Export Development Corp. The ships will be built over a four-year period.

U.S. STEEL GIANT: Mrs. Roger M. Blough prepares to anoint the steel bow of the new super ore carrier named for her husband, with the traditional splash of champagne as Mr. **Blough** looks on. The 858-foot-long Roger Blough was built by The American Ship Building Co., Lorain, Ohio, for United States Steel, and is the largest vessel ever constructed entirely in the shipyards of the Great Lakes. Slated to begin sailing later this year, it is designed to carry 45,000 tons of iron ore pellets from the head of the Lakes to steel mills in the Chicago area. Mr. **Blough** retired in 1969 after serving almost 14 years as chairman of the board and chief executive of U.S. Steel. He continues as a director of the Corporation.

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Barge And Towing Industry Safety Contest Winners Honored In San Francisco, Calif.

Representatives of company winners are shown above with officials of The American Waterways Operators, Inc., which co-sponsors the contest with the National Safety Council. Seated, left to right, are: **Gordon E. Lloyd,** manager, traffic, Western area, U.S. Steel Corporation, who accepted a first place award among contestants engaged in push-towing operations for his company's River Transportation Division, Clairton, Pa.; Capt. **L.F. Gearin,** manager, marine transportation department, Mobil Oil West Coast operations, Terminal Island, Calif., who accepted awards for both the company's Eastern and Western Rivers Fleets; **C.C. Brooks,** president, Rio Towing Company, Houston, Texas, and **John H. Lee,** president of Alaska Hydro-Train, who accepted a second place award for United Transportation Co., San Francisco, Calif., in the pull-towing or towing-alongside operations category of the contest. Standing from the left are: **Braxton B. Carr,** president of The American Waterways Operators, Inc., Washington, D.C.; **George H. Jackson,** president, Western Transportation Co., Portland, Ore.; **Al Greene,** operations manager, for The Harbor Tug & Barge Co., San Francisco; **Terry Klaus,** assistant operations manager, The Harbor Tug & Barge Co.; **Otho H. Haunschild,** president, Levingston Shipbuilding Company, Orange, Texas, and **William C. McNeal,** executive vice president, Oil Transport Company, Incorporated, New Orleans, La., and chairman of the board of AWO.

Winners in the 1970 Barge and Towing Vessel Industry Safety Contest were honored guests at a reception and luncheon sponsored by The American Waterways Operators, Inc., in San Francisco, Calif., May 21.

William C. McNeal, executive vice president, Oil Transport Company, Incorporated, New Orleans, La., and chairman of the board of AWO, made the safety awards presentations and in doing so, called on the barge and towing industry to work harder to achieve an even better safety record than the outstanding one which has already been accomplished.

Peter J. Brix (at right), president, Knappton Towboat Company, Portland, Ore., and former chairman of the board of The American Waterways Operators, Inc., is shown above as he received a commemorative gavel mounted on a plaque from his successor in the AWO post, **William C. McNeal,** executive vice president, Oil Transport Company, Incorporated, New Orleans, La.

The luncheon climaxed two days of AWO meetings and events attended by executives of the barge and towing industry from throughout the United States, a large group of Government officials with whom the industry works, and others.

In another feature of the luncheon, special tribute was paid to **Peter J. Brix,** president, Knappton Towboat Company, Portland, Ore., in appreciation of his services as chairman of the board of AWO in 1970. The tribute was made on behalf of the Association by Mr. **McNeal,** who was elected last February 18 as chairman of the board of AWO, succeeding Mr. **Brix** in that position.

The safety contest, which is cosponsored by the National Safety Council and AWO, is divided into four categories. One is composed of firms engaged in push-towing operations; another of firms engaged in pull-towing or towing-alongside operations; a third of firms engaged in harbor boat operations, and a fourth of firms engaged in ship handling only. Some firms are entered in more than one category of the contest.

U.S. Steel Corporation, River Transportation, Clairton, Pa., was first place winner among contestants engaged in push-towing operations.

Western Transportation Co., Portland, Ore., was second place winner, with **George H. Jackson,** president, accepting the award. Mobil Oil Corporation, Western Rivers Fleet, was third place winner. Capt. **L.F. Gearin,** manager, marine transportation department, West Coast operations, Terminal Island, Calif., accepted the award.

Perfect record certificates in the push-towing operations division of the contest were won by The Harbor Tug & Barge Co., San Francisco, with **Lester C. Bedient,** general manager, accepting the award; Pacific Inland Navigation Company, Inc., Columbia River Division, Vancouver, Wash., with **T.E. Garside,** vice president, accepting the award; Rio Towing Company, Houston, Texas, with **C.C. Brooks,** president, accepting the award, and by Warrior Barge Lines, Inc., Tuscaloosa, Ala.

Winner of the top award in the pull-towing or towing-alongside operations category was Mobil Oil Corporation, Eastern Fleet. Captain **Gearin** accepted the award.

The second place winner was United Transportation Co., San Francisco, Calif. Anderson Petroleum Transportation Co., Inc., Houston, Texas, was third place winner. A perfect record certificate was accepted by Mr. **Bedient** in the pull-towing and towing-alongside operations category of the contest for The Harbor Tug & Barge Co.

Winner of the top award honor in the ship handling only category of the contest was Levingston Shipbuilding Company, Orange, Texas. **Otho H. Haunschild,** president, accepted the award.

Perfect record certificates in the harbor boat operations division of the contest were won by The Harbor Tug & Barge Co., with Mr. **Bedient** accepting the award, and by The Trinity Valley Barge Line, Galveston, Texas.

All of the winners maintained perfect safety records in 1970.

Mr. **McNeal** paid tribute to the leadership of **Ralph A. Guffey,** A.L. Mechling Barge Lines Inc., Joliet, Ill., who as chairman of AWO's safety committee, serves a major role in planning and executing AWO's safety program, of which the Barge and Towing Vessel Industry Safety Contest is a part.

The luncheon and the series of meetings of AWO directors, members and committees were held in San Francisco starting May 20. The focal point of interest for the series of meetings and events was the spring quarterly meeting of the AWO board of directors held on the morning of May 21. The 47 AWO directors from throughout the United States considered reports of committees and reviewed various phases of the Association's programs, as well as current legislative proposals pending before the Congress which affect the barge and towing industry.

Twin Survey Boats Delivered By Grafton

The Darbon and her twin, the Bland II, are capable of speeds of over 25 mph.

The 40-foot steel survey boats Bland II and Darbon have been delivered to the New Orleans District of the U.S. Army Corps of Engineers. Designed, built and delivered by Grafton Boat Co., Inc. of Grafton, Ill., the new vessels will be used by the Corps in surveying the Mississippi River below New Orleans, Lake Pontchartrain, the Atchafalaya River below Morgan City, and the Intracoastal Waterway throughout the New Orleans District.

With hulls 40 feet by 14 feet, the new boats are designed to handle rough water in stride. They are powered by twin General Motors Detroit Diesel 8V-53N engines, rated at 260 hp, and have Onan 15-kw diesel generator sets for electrical power. The interior arrangement is completely open, and places the operator near the bow of the vessel for unobstructed visibility, and a clear working area and afterdeck over 24 feet long for use of the survey party.

The boat is equipped with a complete range of electronic equipment, including several types of depth sounding machines, Benmar radar, single side band, AM and VHF/FM radios, and other specialized apparatus.

Grafton Boat has long been a major supplier of small vessels to various United States Army Engineer Districts, and these two vessels bring to eight the number of boats built for the New Orleans District by Grafton since 1970. Other work presently under way at Grafton includes two fireboats, a 40-foot debris recovery/oil spill vessel for the city of Buffalo, a 36-foot towboat for the Corps of Engineers in Chicago, and several landing barges for a major power company. Grafton Boat is a wholly-owned subsidiary of Continental Boiler and Sheet Iron Works of St. Louis, Mo., and is headed by president **Edward D. Fry.**

Norfolk's $5,925,050 Apparent Low To Build Thailand Escort Ship

Norfolk Shipbuilding & Drydock Corp. is apparent low bidder on a 275-foot patrol escort ship (F-PF-108) for the Thailand Government. The Norfolk, Va., yard's bid was $5,925,050.

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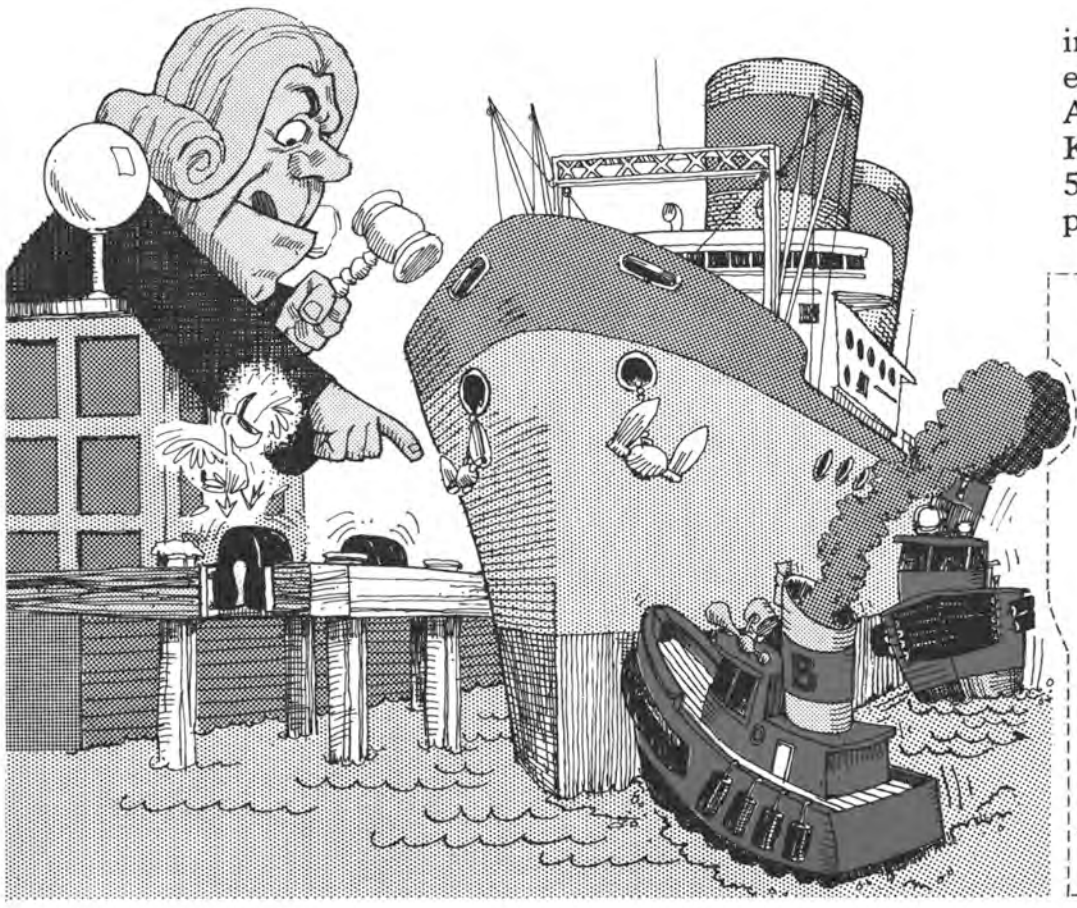

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Maritime Day 1971 Celebrations Indicate Bright Future For Shipping

National Maritime Day, May 22, climaxed World Trade Week across the nation with various activities which were designed to present the U.S. merchant marine to the public. However, special observances were held throughout the week which highlighted the importance of the merchant marine in the growth and future of the United States and the future of U.S. world trade.

The Port of New York actually started its observance of Maritime Day on May 20 when the Propeller Club of the Port of New York was host at a Maritime Day luncheon at the Statler Hilton Hotel. The Port's official ceremonies were held at noon on May 21 in Battery Park. A highlight of the colorful activities was a parade of over 400 cadets and midshipmen from New York's two maritime colleges. Saluting the American merchant marine, from a reviewing stand in front of old Castle Clinton, were top executives in the maritime industry.

Adm. **John M. Will**, president and chairman of the board of American Export Isbrandtsen Lines, and honorary chairman of the Maritime Industry Committee, served as master of ceremonies. Adm. **Chester R. Bender,** commandant of the Coast Guard, was the principal speaker.

Concluding this year's New York World Trade Week and the two-day Maritime Day programs was the first commercial maritime parade ever conducted in the Port of New York. A grand parade of more than 50 ships and harbor craft passed in review in the Narrows of New York Harbor. The massive display of shipping, some eight miles long, included historic ships, harbor craft, government vessels, containerships, freighters and passenger liners.

Across the country in San Francisco the annual observance of National Maritime Day was marked by a week-long series of public events. In this city the celebration was sponsored jointly by the Port of San Francisco Propeller Club and the Marine Committee of the San Francisco Junior Chamber of Commerce. General chairman in charge of the week's activities was Brig. Gen. **R.C. Tripp,** (ret.), vice-president of Acme Dunnage and Service Company, Oakland. Deputy chairmen were **Thomas J. Patterson Jr.,** western regional director, Maritime Administration, and **John Jensen,** American President Lines.

The celebration of this special week started on Sunday in San Francisco with the International Lifeboat Race and ended with the Maritime Day Ball on Saturday. Following the lifeboat race was the Golden Gate Marine Parade which was a two-mile long procession of all types of gaily decorated harbor craft and oceangoing vessels. Grand marshal of the Marine Parade was Adm. **Mark A. Whalen,** commander of the Twelfth U.S. Coast Guard District.

On Thursday of World Trade Week San Francisco held its annual container display which featured equipment from 20 different Pacific Coast firms. The annual Seaman's Memorial Service, honoring the men who have lost their lives at sea, was held aboard the famed sailing vessel C.A. Thayer. The California Maritime Academy provided the color guard and the rifle squad for the service.

This memorial service was followed by a luncheon at which **Andrew E. Gibson,** Assistant Secretary of Commerce for Maritime Affairs, was the principal speaker. In his address, Mr. **Gibson** said that the 1970 Merchant Marine Act is now beginning to fulfill the purpose of reinvigorating the nation's maritime industry. He noted that contracts have now been signed, amounting to some $78 million, for three new lighter-aboard-ship vessels and that by the end of June contracts will also be signed for new bulk carriers. He praised the U.S. shipyards for their efforts to improve production and reduce costs.

In New Orleans, La., **James J. Reynolds,** president of the American Institute of Merchant Shipping, in an address before the New Orleans Propeller Club, predicted a bright future for U.S. shipping due to the passage of the 1970 Merchant Marine Act. In predicting the U.S.-flag shipping future, Mr. **Reynolds** said that:

1. There will be an enormous shipbuilding boom in the United States in the remaining years of this decade.

2. By 1975, the main criticism of the Merchant Marine Act of 1970 will be that its 300 ship-equivalent goal was "simply too conservative a figure."

3. The building of large, modern bulk carriers, as well as the continued progress in developing faster and more efficient cargo liners, will enable the merchant marine to carry a "sizeable percentage" of our nation's foreign trade.

4. There will be a relative stability in both government and commercial ocean shipping rates, due in large measure to the enlightened efforts of the Federal Maritime Commission.

Federal Maritime Commission Chairman **Helen Delich Bentley,** speaking before an international trade conference held in Milwaukee, Wis., said her agency had made considerable progress in erasing ocean steamship rate inequities which have been detrimental to the nation's foreign commerce.

Mrs. Bentley illustrated this progress by pointing out that two North Atlantic steamship conferences have made major rate adjustments and the Far East Conference had voluntarily reduced rates on 10 commodities, thereby reducing or eliminating rate disparities. She also noted that similar adjustments are to be implemented by conference lines serving the Great Lakes-Mediterranean trade.

Mrs. Bentley also was the main speaker at a luncheon meeting of the Chicago Propeller Club celebrating National Maritime Day.

Philadelphia, Pa., held its annual Maritime Day luncheon on May 20. The luncheon was followed by a cruise of the port. **Charles K. Cox,** chairman of the Mayor's Committee for World Trade Week, president of the Insurance Company of North America and vice president of the INA Corporation, took this opportunity to focus public attention on the Ports of Philadelphia, called "Ameriport," which is first in the nation's import tonnage, the second largest in terms of international trade, and the country's leading industrial port.

Mr. **Gibson** followed his appearance in San Francisco with an address before the Portland (Oregon) Propeller Club. He took this opportunity to explain how the Maritime Administration is assisting ship owners and operators in financing new ship construction and in obtaining cargoes. Mr. **Gibson** also spoke at length regarding the practicality of building the Alaskan pipeline to carry oil from the North Slope to Valdez. He feels that as soon as the furor raised on the ecology question, which he said had no basis in fact, has died down the pipeline will be constructed. This in turn will require the building in U.S. shipyards of some 70 tankers.

In conclusion, Mr. **Gibson** said, "At this Maritime Day 1971 we are about to witness an entire rebirth of the American merchant marine. As the result of President **Nixon's** maritime program and the development of our Alaskan oil reserves, we are on the threshold of the greatest sustained peacetime building program in our history and in so doing the United States will once again take its rightful place among the great maritime nations of the world."

Numerous other foreign trade and Maritime Day celebrations were held throughout the country sponsored by the various ports of the Propeller Club of the United States and other organizations. Top government officials and elected representatives spoke at most of these affairs and presented a generally optimistic viewpoint for shipbuilding and shipping.

Borg-Warner Division Names R.L. Schroeder International Sales Mgr.

Richard L. Schroeder

Richard L. Schroeder has been named manager, international sales, for the Warner Gear/Warner-Motive divisions of Borg-Warner Corporation, **Spencer H. Mieras,** divisional president, has announced.

Mr. **Schroeder** has overall responsibility for the divisions' broadened sales and service activities in European and British markets, including Warner-Motive Produkte GmbH, a Borg-Warner subsidiary located at Gross-Mackenstedt, West Germany, and the Warner Gear/Warner-Motive divisions of Borg-Warner Limited, At Biggleswade, U.K.

Warner Gear/Warner-Motive, which is headquartered in Muncie, Ind., manufactures a broad range of transmissions and other power transmitting products for automotive, marine and industrial use, as well as a complete line of hydraulic pumps, motors and valves used in industry, agriculture and construction.

Mr. **Schroeder** has been with the divisions since 1958, when he was hired as a sales engineer. He is a graduate of Purdue University.

Ameron Offers Booklet On Expanded Line Of Bondstrand FRP Pipe

Bondstrand fiberglass-reinforced plastic pipe, formerly manufactured in only three types and in 12-inch diameter maximum, is now available in five different series with two series having up to 48-inch diameters. The complete line is described in a new brochure issued by Ameron Corrosion Control Division, Brea, Calif.

Updating all previously published information about Bondstrand FRP pipes, this booklet deals with the capabilities of the different pipe series. For easy comparison purposes, there is a tabular listing of such characteristics as temperature and pressure ranges, available diameters, compatible fittings, and general cost information on each of the five pipe series.

Described and illustrated are specific services in which Bondstrand is being used in the chemical, paper, food and other industries. Also explained and illustrated are the reasons why Bondstrand is so easily installed.

Copies of the new two-color booklet can be obtained free of charge by writing Ameron Corrosion Control Division, Brea, Calif. 92621, requesting "Bondstrand Pipe Brochure."

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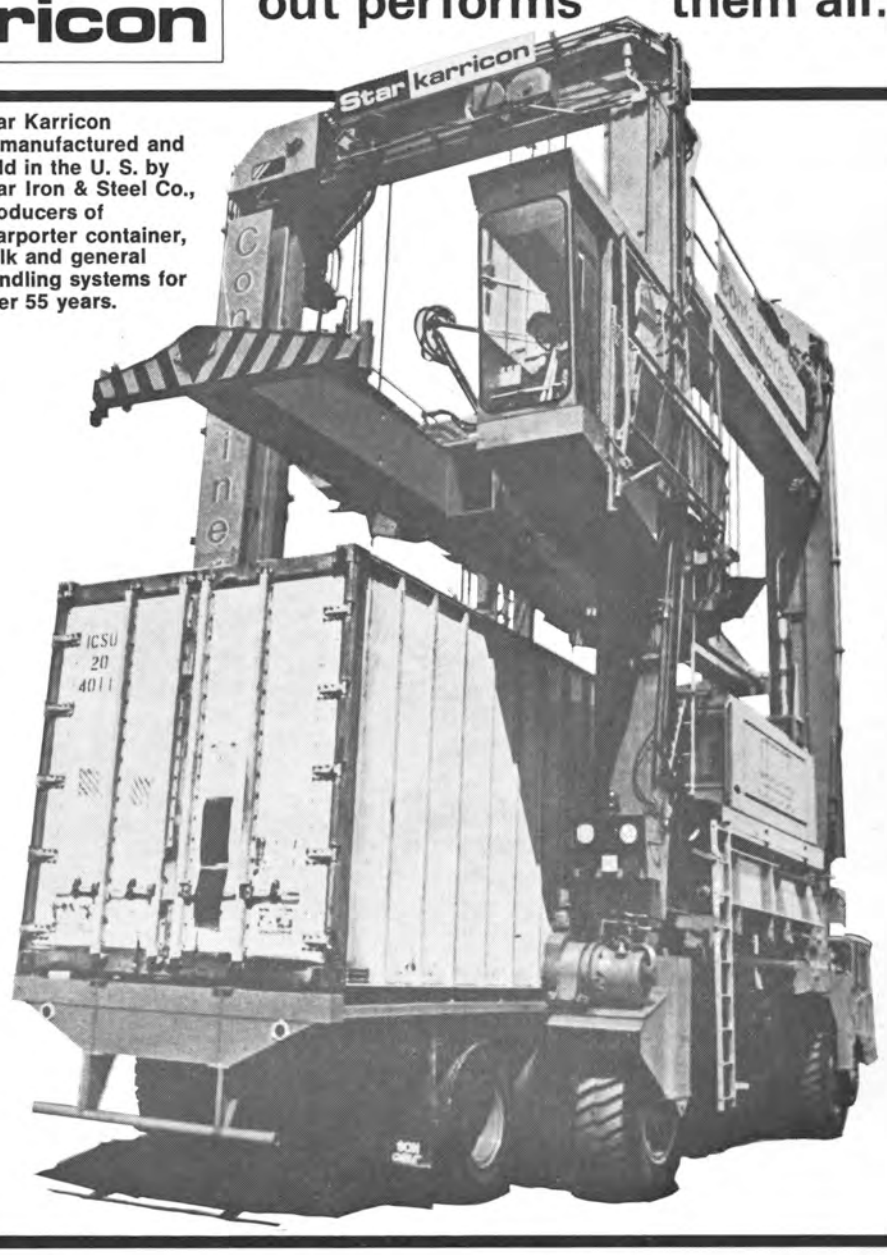

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Serrie And Steadman Promoted At Ingalls Nuclear Shipbuilding


John A. Serrie Jr.


James W. Steadman

Two key management promotions at the Ingalls Nuclear Shipbuilding division of Litton Industries, Pascagoula, Miss., have been announced by division president **N.J. Marandino.**

John A. Serrie Jr. has been promoted from the position of vice president, engineering and procurement, to vice president, operations. **James W. Steadman** has been promoted from chief design engineer to director of division engineering.

Mr. **Serrie** has been with Ingalls since 1968 and brings more than 25 years of shipbuilding experience to his new position. He attended Georgia Institute of Technology, Atlanta, Ga., and holds a B.S. degree in marine engineering and naval architecture from the Massachusetts Institute of Technology. He is a member of the Society of Professional Engineers in states of Mississippi and Connecticut and a member of The Society of Naval Architects and Marine Engineers. He served in the Navy aboard destroyers.

Mr. **Steadman,** an Ingalls engineer for 20 years, joined the company as a mechanical engineer and has held a wide range of engineering assignments. He holds an engineering degree from Alabama Polytechnic Institute and has received advanced studies through the University of Southern Mississippi and North Carolina State University. He is a member of The Society of Naval Architects and Marine Engineers and serves on the shipbuilding advisory committee of the Naval Ship Systems Command.

Litton Industries, headquartered in Beverly Hills, Calif., is a major multinational corporation specializing in products, systems and services for business, defense, marine, industrial and professional markets.

ERIK F. JOHNSEN HONORED: Erik F. Johnsen (center) president of Central Gulf Steamship Corporation, has been honored as Louisiana's "Maritime Man of the Year." With Mr. **Johnsen** are **James J. Reynolds** (left), president of the American Institute of Merchant Shipping and **George A. Christensen,** president of the New Orleans Propeller Club. The presentation was made at a banquet sponsored by The Propeller Club in connection with National Maritime Day.

Floating Warehouse In Service Between West Gulf And P.R.

Puerto Rico Marine Lines, Houston, Texas, have announced a new 340,000 cubic foot "floating warehouse" is now in service between ports in Puerto Rico and the West Gulf. The "floating warehouse" is on a 250-foot by 76-foot ocean barge.

G.A. Watkins, executive vice president, PRML, reported that the firm's first sailing was extremely well received by Puerto Rican shippers. "It looks as if this type of service is just what the Puerto Rico shipper needs to keep the costs down," he said. "It is our intention to continue to improve this service and we already have added new equipment to our fleet."

Other oceangoing vessels scheduled to join the fleet include two 400-foot by 76-foot ocean barges with both open deck space for heavy machinery and a 325,000 cubic foot enclosed "floating warehouse." Twice monthly service is planned with these new additions.

One of PRML's concepts is palletization and unitization of all cargo to expedite handling by mechanical means.

PRML presently services the ports of Ponce, Mayaguez and San Juan from Houston, Lake Charles, Port Arthur and Galveston on a monthly basis using three barges, one equipped with two 125-ton heavy-lift cranes. Lykes Bros. are general agents.

Fourth Bagley Launched At Lockheed

The DE-1069 Bagley was recently launched at Lockheed Shipbuilding and Construction Company's shipyard on Harbor Island in Seattle, Wash. Sponsor was **Mrs. David Worth Bagley,** widow of the late Adm. **David Worth Bagley.** The ship was named for Admiral **Bagley,** who had a long and distinguished career in the Navy, and his brother, Ens. **Worth Bagley,** who was the first naval officer to die in action during the Spanish American War.

The DE-1069 is the fourth ship to carry the Bagley name.

Principal speaker at the ceremonies was Vice Adm. **Worth H. Bagley,** Director of General Planning and Programming Division, Office of the Chief of Naval Operations, who is one of Admiral and Mrs. **Bagley's** three sons. Maid of honor was **Miss Marie Louise Bagley,** daughter of Rear Adm. **David H. Bagley,** Assistant Chief of Personal Affairs, Bureau of Naval Personnel. The flower girl was **Miss Maria Page Mattingly,** whose father, **Donald Mattingly,** is shipfitter foreman on the Bagley.

The Bagley is the fourth of five DE-1052 Class destroyer escorts Lockheed is building for the Navy. The ships are 438 feet long, have a beam of 46 feet 9 inches, and displace 4,100 tons at full load. The ship is designed for antisubmarine warfare, as well as search, patrol, and surveillance missions.

Lockheed delivered the DE-1057 Rathburne last year. Other class ships under construction in the yard include the DE-1063 Reasoner, DE 1065 Stein, and the DE-1073, as yet unnamed.

The first Bagley (Torpedo Boat 24) was launched September 25, 1900; the second Bagley (DD-185), October 19, 1918, and the third Bagley (DD-386), December 3, 1936.

Pott Industries, Inc. Elects John P. Fechter

Pott Industries Inc., St. Louis, Mo., has announced that **John P. Fechter** was elected vice president and controller of the company at the recent board of directors meeting. Mr. **Fechter,** who joined the company in 1953, was formerly controller and assistant secretary and assistant treasurer of the company. All of the other officers of the company were reelected at the meeting.

ICHCA Cargo Handling Conference Being Held In Oakland Sept. 16-17

The United States National Committee of the International Cargo Handling Coordination Association has announced plans for a cargo-handling technical conference to be held September 16 and 17 at the Hilton Inn in Oakland, Calif.

With a theme "The Change and Challenge of Intermodal Cargo Handling," the seminar will bring together experts from all phases of transportation. Discussions will center on new developments in cargo handling that are making a significant impact on the distribution of the world's goods and on trade patterns.

Four particular areas of interest will be highlighted—innovations in marine terminal design and operation; new developments in refrigerated cargo movements; new developments in intermodal handling of containers by air; outports and feeder systems, and labor relations in cargo handling.

Lt. Col. **Charles Earle,** secretary general of the International Cargo Handling Corp. Assoc. will be the keynote speaker; **Ben E. Nutter,** executive director of the Port of Oakland, will serve as general chairman for the event; **J. Eldon Opheim,** general manager of the Port of Seattle, and **Thomas J. Thorley,** general manager of the Port of Long Beach, will be daily chairmen of the seminar. Panel discussion leaders will include **B.J. Caughlin,** general manager of the Port of Los Angeles; **Eric Rath,** president of the Rath Co.; **C.R. Redlich,** president of Marine Terminals, Corp., and **Sam Kagel,** labor relations attorney.

In addition to the program of addresses by transportation experts and panel discussions, a boat tour of the Port of Oakland's extensive marine terminals facilities and a look at railroad container operations will also be included. ICHCA members attending the seminar will have the opportunity to visit the International Shipping and Containerization Exposition and Congress that will be held in Oakland that same week.

Member registration for the ICHCA seminar is $32. Nonmember registration is $45. Further information about the event can be obtained by writing the U.S. National Committee of the International Cargo Handling Coordination Association, Inc., c/o Port of Oakland, 66 Jack London Square, Oakland, Calif. 94607.

The International Cargo Handling Coordination Association has more than 1,800 members from about 70 nations. It is a nonprofit, nonpolitical organization devoted to the improvement of cargo-handling techniques through a program of study and informational exchange.

Bulletins On Marine Sewage Systems Released By Colt

Three new bulletins descriptive of their marine sewage systems have been released by Colt Industries' Water and Waste Management Operation, Beloit, Wis. 53511.

The first bulletin, in color, describes in detail the two sizes (5,800 and 17,000 gpd) now available for shipboard application. The bulletin is designated as File 7005A. Detailed description of the units with flow diagrams feature this bulletin.

Also available are two "Ratings and General Data" bulletins designated as File 7006 (5,800 gpd units) and File 7007 (17,000 gpd units).

Further details may be obtained from Colt Industries' Water and Waste Management Operation, **Paul Weiss,** Sales Manager, Beloit, Wis. 53511.

Takeshi Akasaka

Takeshi Akasaka, president since 1963 of Nippon Kokan, leading Japanese shipbuilders and steelmakers, died recently in Keio Hospital, Tokyo. He was 70 years old.

As president since April of the Japan Shipbuilding Industrial Association, Mr. **Akasaka** had been involved in weighing implications of a possible revaluation of the yen. He had been energetic in promoting trade ties with Communist China.

Mr. **Akasaka,** a law graduate of Tohoku Imperial University in 1930, joined Nippon Kokan in 1933. He had been a director since 1949. Under his leadership, the company built one of the world's most modern integrated steel mills at Fukuyama on the Inland Sea. Its fourth blast furnace completed in April, gave it an annual capacity of 12 million tons of crude steel a year.

Mr. **Akasaka** is survived by his wife, **Sui.**

Ameron Guide For Chemical Service Use

There is now available in easy-reference chart form a guide to the temperatures and degrees of concentration at which 300 chemical solutions can be handled by low cost Bondstrand fiberglass-reinforced plastic tanks. Data is based on information obtained from both service experience and extensive testing of the epoxy and polyester resin tanks in a wide range of chemical services.

Free copies of the eight-page guide may be obtained by writing Ameron Corrosion Control Division, Brea, Calif. 92621, requesting "Tank Chem Chart."

Amirikian Engineering New Architectural Firm Opens Two Offices

Dr. **Arsham Amirikian,** until recently Chief Engineering Advisor to the Commander, Naval Facilities Engineering Command, Navy Department, Washington, D.C., has retired from Government service to enter private practice.

He will head the architect-engineer firm Amirikian Engineering Company, engaged in planning, design, construction supervision, and investigations concerning special shore and floating structures and harbor and docking facilities with offices at 1401 Wilson Boulevard, Arlington, Va. 22209. Telephone (703) 524-2273.

Dr. **Amirikian** will also be available for personally rendered consulting services with offices at 6526 Western Avenue, Chevy Chase, Md. 20015. Telephone (301) 652-6238.

Maritime Arbitrators Election Of Officers

The Society of Maritime Arbitrators, Inc., New York, N.Y., recently held its annual meeting for the election of officers for the ensuing year.

Officers were elected as follows: president, **Michael Van Gelder,** M.A. Van Gelder, Inc.; vice president, **John M. Reynolds,** Association of Ship Brokers and Agents, Inc.; secretary, **Jones F. Devlin Jr.,** maritime consultant. Directors, each to serve for two years, are: **John P. Besman,** Sagus Marine Corp.; **Hammond Cederholm,** James W. Elwell Co., and **Allen Cameron,** Allen Cameron Associates.

IHI, Japan, Launches World's Largest Ship

The Nisseki Maru being moved out of the building basin at the Kure shipyard of IHI. Ship will be completed in September and enter service between Japan and Persian Gulf.

The world's largest ship, the 372,400-dwt tanker Nisseki Maru, was launched recently at the Kure shipyard of IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.), Japan. The ship is being built for Tokyo Tanker Co., Ltd., a member of the Nippon Sekiyu Group.

The Nisseki Maru has an overall length of 1,138 feet 6 inches, a breadth of 178 feet 10 inches, a depth of 114 feet 10 inches, and a loaded draft of 88 feet 7 inches. It is fitted with a 40,000-shp steam-turbine power plant developing a service speed of 14.5 knots.

After completion, scheduled for September this year, the tanker will be engaged in carrying crude oil from the Persian Gulf to the Nippon Sekiyu Group's central terminal station at Kiire in Kagoshima Bay, Japan. When fully loaded, the tanker will run through the Lombok Straits, since the Malacca Straits are too shallow for the ship to pass through. However, when unloaded, it will travel via the Malacca Straits, which is the shortest route between Japan and the Persian Gulf.

With the launching of this ship, IHI has renewed its world's largest ship record for the fourth time. IHI completed the 153,000-dwt Tokyo Maru in 1966, the 206,000-dwt Idemitsu Maru in 1966, and the 326,000-dwt Universe Ireland in 1968, each the largest ship at that time. IHI also will begin construction of an even larger tanker, the first of two 477,000-dwt ships on order by Globtik Tanker Limited of Great Britain, in February 1972.

Special features of the Nisseki Maru include:

1. An inert-gas system adopted for anti-explosion in the cargo tanks. The system blows inert gas into the tanks, full or empty, reducing the oxygen density in the tank air. The exhaust gas of the vessel's boiler is used as the inert gas after being cooled and cleaned by seawater.

2. In addition to the 14-cargo-oil tanks and one ballast tank, the vessel has two slop tanks for separating oil from water. Fixed-type automatic cleaning equipment is adopted for the tanks.

3. Due to the size of the ship, a slow-speed meter is provided for use in place of the pilot's intuition to measure the vessel's fine movements in all directions caused by wind or waves during the vessel's siding, anchoring, leaving or passing through a narrow water passage in order to prevent grounding or collision with a quay wall.

4. The vessel is equipped with an anti-collision device attached to one radar to automatically warn of any approaching vessel or obstacle.

5. The main engine, boiler, and most auxiliary equipment are centrally monitored from the engine control room, and the main stand-by equipment is switched over automatically to function at any time the regular equipment fails. The boiler water level is monitored by TV to prevent any boiler explosion because of low water.

Bethlehem Shipbuilding Moves Executive Office To Pennsylvania

The office of the vice president in charge of the shipbuilding department of Bethlehem Steel Corporation will be moved from existing quarters at 25 Broadway, New York, N.Y., to the corporation's headquarters in Bethlehem, Pa. Relocation is scheduled to be completed by mid-August. About 15 employees will be relocated.

The offices of ship repair sales, special products sales and ship development and sales are not included in the move. They will remain at 25 Broadway, where the corporation maintains other offices, including steel export sales, corporate securities and sections of the corporation's treasury, billing and marine division activities.

Walter F. Williams, vice president of shipping, said the move is being undertaken to improve overall functioning of the department and to obtain closer coordination with the executive offices of the corporation in such matters as planning, engineering, legal and financial affairs, accounting, and administration of corporate policy.

Dubuque Boat Awarded Switchboat Contract

Dubuque Boat & Boiler Company, Dubuque, Iowa, has been awarded a contract to build a 1,000-hp switchboat for service at the New Madrid, Mo., power plant of Associated Electric Cooperative.

The overall dimensions of the switchboat will be 65 feet long, 24 feet wide, and 8 feet in depth. The hull is to be of multiple chine construction with a fairbody tunnel stern. Propulsion will be from GM 16 V-71 diesel engines and two 30-kw GM generators will supply the electric power.

Delivery is slated for late fall.

Port Authority Issues New Edition New York Harbor Terminals Map

A new edition of the New York Harbor Terminals Map has been released by the Port Promotion Division of The Port of New York Authority.

The four-color 20-inch by 27-inch map shows the location of steamship piers, railroads, bridges, tunnels, major highways, railroad freight and passenger stations, and other transportation facilities in the New Jersey-New York Port. The reverse side of the map carries detailed panels showing street connections to piers and terminals.

Copies of the new map, which is free of charge, may be obtained in New York from the Port Promotion Manager, The Port of New York Authority, 111 Eighth Avenue, New York, N.Y. 10011, or from the Port of New York Trade Development Office, 170 Broadway, New York, N.Y. 10038. The new maps can also be obtained from the Port of New York Trade Development Offices in Chicago, Cleveland, Pittsburgh, Washington, San Juan, London and Zurich.

E. Canadian Section Elects 1971-72 Officers —Schedules Meetings

The Eastern Canadian Section of The Society of Naval Architects and Marine Engineers have elected the following officers and committee for 1971-72: **G.E. Kristinsson,** chairman; **R.C. Truax,** vice chairman; **R. Sinclair,** secretary; **G. Almond,** executive; **R. McAleese,** executive; **J.R. Strang,** executive; **P. Bouisseau,** papers chairman; **J. Davis,** meetings chairman; **J.G. German,** membership chairman; **C.H. Owston,** publicity chairman, and **K.P. Farrell,** past chairman.

Meetings have been scheduled as follows: October 1971, Montreal, opening address; November 1971, Quebec; January 1972, Ottawa; February 1972, Montreal, joint meeting with I.M.E.; March 1972, Toronto; April 1972, Montreal, annual general meeting, and May-June 1972, spring field trip.

The exact dates and papers to be presented will be announced at a later date.

Dravo Elects Three Vice Presidents

Charles A. Patten

Gustav Schwab

James R. Sharpe

Charles A. Patten, Gustav Schwab and **James R. Sharpe** have been elected vice presidents of Dravo Corporation, diversified Pittsburgh-based firm.

The three men continue as general managers of Dravo operating units. Mr. **Patten** heads the firm's Engineering Works Division, Mr. **Schwab** the Pipe Fabrication Division, and Mr. **Sharpe** the Engineering Construction Division.

Mr. **Patten** is a graduate of Lehigh University, with a degree in mechanical engineering. A native of Allentown, Pa., he was with Dravo from 1942 through 1947, returning to the company in 1969.

Born in Oakland, Calif., Mr. **Schwab** holds a degree in mechanical engineering from Stevens Institute of Technology. He began his career with Dravo in 1939.

Mr. **Sharpe,** a native of Columbus, Ohio, graduated from Ohio State University, with a degree in civil engineering. He joined Dravo in 1957.

NASSCO Launches Fourteenth In Series Of Tank Landing Ships

Dignitaries who participated in the ceremony were, from left to right: Capt. **H.A. Gerdes,** USN, Supervisor of Shipbuilding, Conversion and Repair, USN, 11ND, San Diego; Vice Adm. **Nels C. Johnson,** USN, Commander, Amphibious Force, U.S. Pacific Fleet; **John V. Banks,** National Steel and Shipbuilding Company, executive vice president; **Holland M. Smith,** son of Vice Admiral **Smith** and **Mrs. Smith;** Vice Adm. **J. Victor Smith,** USN, Commandant, Industrial College of Armed Forces; **Mrs. J. Victor Smith,** sponsor of the Barbour County; **Mrs. Ralph S. Hambrick,** matron of honor of the Barbour County; Rear Adm. **Harry C. Mason,** USN, Representing Commander, Naval Ship Systems Command; the Honorable **Frank Curran,** mayor of San Diego; **Thomas E. Morris,** newly-elected Navy League national president, and **James M. Hannan,** the outgoing Navy League national president.

The Barbour County (LST-1195) was recently launched at National Steel and Shipbuilding Company, San Diego, Calif.

The launching of the Barbour County culminated the week's activity of San Diego's 1971 National Convention of the Navy League.

Mrs. J. Victor Smith, formerly of La Jolla, Calif., and wife of Vice Adm. **J. Victor Smith,** USN, sponsored the Barbour County. Her daughter, **Mrs. Ralph S. Hambrick** of Syracuse, N.Y., served as matron of honor.

Vice Admiral **Smith** and **Mrs. Smith** have deep roots in the San Diego area, having lived there on five occasions during Admiral **Smith's** career. His last local assignment was as Commander, Amphibious Force, U.S. Pacific Fleet, with headquarters in Coronado.

Military and civilian dignitaries participating in the ceremony included Vice Adm. **J. Victor Smith,** USN, Commandant, Industrial College of Armed Forces; Rear Adm. **Harry C. Mason,** USN, Representing Commander, Naval Ship Systems Command; Capt. **Robert E. Anderson,** USN, Force Chaplain, Amphibious Force, U.S. Pacific Fleet; Capt. **Henry A. Gerdes,** USN, Supervisor of Shipbuilding, Conversion and Repair, USN, 11ND, San Diego; **John V. Banks,** National Steel executive vice president, and **John M. Murphy,** National Steel vice president of sales.

Many high-ranking military and civilian officials, present for San Diego's 1971 National Convention of the Navy League, were in attendance at the launching.

The Barbour County (LST-1195), a tank landing ship, is the first ship of the fleet to be named in honor of Barbour County, Ala., and it is the 14th LST in a series of 17 to be built by National Steel and Shipbuilding Company for the U.S. Navy. She is one of the new class of tank landing ships of an entirely new design, larger and faster than any of their predecessors. She is designed to provide the fastest and most efficient means of landing tanks, combat vehicles and artillery under assault conditions.

The Barbour County (LST-1195) is designed for an overall length of 522 feet and extreme beam of 69 feet; a full load displacement of 8,000 tons; mean draft of 15 feet, and a speed in excess of 20 knots.

The main propulsion for each of the 17 tank landing ships consists of six 16 cylinder Model 251 ALCO Diesel engines.

Approximately 3,000 spectators were on hand to view the public ceremony.

AMETEK, Inc. To Acquire Marquardt Doppler System

AMETEK, Inc. announced that it has reached an agreement to acquire the Marine Electronics Products of the Marquardt Corporation, a division of CCI Corp., in Van Nuys, Calif., for an undisclosed amount of cash.

Over the past five years, Marquardt's Marine Electronics Products Department has developed and patented the unique Doppler Sonar Navigation System which provides precise speed, course and position data for geophysical survey, oceanographic research and petroleum exploration ships. Marketed internationally, annual sales of this Doppler Sonar Navigational System and related products are in the two-million dollar range, almost entirely for commercial applications.

AMETEK will operate the Marine Electronics Products group as a part of its Straza Division near San Diego, Calif., with no major changes planned in the operation or personnel. AMETEK/Straza, a leading developer and manufacturer of CTFM Sonar Systems for both naval and commercial application for the past 10 years, operates extensive marine electronics manufacture, testing and development facilities at its El Cajon, Calif., plant where AMETEK has just added a 50,000-square-foot building exclusively for engineering and manufacture of marine products.

Gerald G. Loehr, president of AMETEK/Straza, noted that the two operations are "completely complementary in engineering, products and marketing systems. Combining the outstanding talent in this group which perfected the Doppler Navigational Sonar System with AMETEK's financial and marketing support, we feel that we can continue and extend the leadership in marine equipment performance and service established by Marquardt."

AMETEK, a diversified manufacturer of scientific and industrial equipment with plants in the United States and Common Market countries, had sales last year of $136 million. AMETEK has been listed on the New York Stock Exchange since 1930.

American Hydromath Supplies TRIMOGAGE For 5 Vessels For Maritime Overseas Corp.

American Hydromath Company, Hempstead, N.Y., has recently supplied Maritime Overseas Corporation with TRIMOGAGE for each of the following vessels: Overseas Joyce, Overseas Alice, Overseas Traveler, Overseas Progress and Overseas Explorer.

TRIMOGAGE is a solid-state electronic device which automatically predetermines the forward and aft draft and deadweight or displacement which a ship will have under any longitudinal distribution of load. It displays on its front panel an inboard profile and plan view of the vessel with digital inputs for each major longitudinal station (compartment or tank). On each digital input the total amount of variable weight (cargo oil, gasoline, cargo, fuel, water, crew, stores, etc.) loaded in that station, is set. For tank capacities of more than 10,000 tons, switches are provided. By flicking one of them, 10,000 tons are added.

Upon the setting of these weight inputs, the two meters at the right and left give direct readings in fore and aft draft respectively, while the center meter gives direct reading in deadweight or displacement. Thus one may obtain with speed and accuracy a complete trim calculation, or determine the effect of adding or shifting a single weight item, or try out what measures to take to obtain a certain desired trim.

American Hydromath Company is known for their LOADOSCOPE draft and stress computer, and STABILOGAUGE stability computer. Descriptions of these instruments may be obtained from American Hydromath Company, 313 Clinton Street, Hempstead, N.Y. 11550.

Great Lakes/Great Rivers Sect. Hears Four Technical Papers —Tours Self-Unloader At Lorain

Among those attending the meeting are, left to right: (standing) **M.W.C. Oosterveld,** author; **John Woodward,** Section papers chairman; **Harry H. Kendall,** meetings chairman; **William Werschin,** Colt Industries Power Systems Division, and **John O. Greenwood,** Section publicity chairman; (seated) **Jan A. Lorenzen,** author; **Scott Elder,** author, and **Jan P. Hooft,** assistant to Mr. **Oosterveld.**

Over 160 members and guests attended the recent spring meeting of the Great Lakes and Great Rivers Section of The Society of Naval Architects and Marine Engineers, held at Port O' Call Motor Inn in Cleveland, Ohio.

The morning business and technical session included papers as follows: "Impact of Legislation on Great Lakes Shipping," by **Scott Elder,** general counsel, Lake Carriers' Association, Cleveland, Ohio; "A Standardized Ship Design for the Great Lakes," by **Jan A. Lorenzen,** naval architect, J.J. Henry Co., Inc., Cleveland, Ohio.; "Ducted Propellers, Bow Thrusters and Right-Angle Drives," by **M.W.C. Oosterveld,** Netherlands Ship Model Basin, Wageningen, the Netherlands; "Engineering Design of the S.E.M.T.-Pielstick PC-2 Diesel Engine," by **W.T. Hailey** and presented by **Richard D. Jacobs,** Colt Industries Power Systems Division, Beloit, Wis.

Following lunch, the group boarded buses for the trip to Lorain, Ohio, and a tour of the M/V Roger Blough being built at the American Ship Building Company's Lorain yard. Practical application of the engine discussed in the morning session's last paper was viewed in the engine room of this United States Steel Corporation bulk freight self-unloader.

The group returned to Cleveland for a reception and dinner to conclude the day's activities.

The next Great Lakes and Great Rivers Section meeting will be held in Louisville, Ky. on September 29-30, 1971. A joint three-day Technical and Research Symposium with the Eastern Canadian Section will be held July 21, 22 and 23, 1971, at Ottawa, Ontario.

Marine Industrial Introduces New Power Outlet System For Refrigerated Containers

With an eye toward additional safety, Marine Industrial Products Co. of Little Falls, N.J., has developed and is now producing a line of plug connectors, receptacles and automatic interlocked power outlet panels for use with refrigerated containers on board and ashore. All units are designed to be compatible with existing equipment. It is therefore possible to begin using MIPCO products on a new installation, as well as exchanging units as needed.

MIPCO's survey of present installations brought out the need for improved safety features, and these have been incorporated into their design, some of which are: (a) complete water and dirt tight plugs and enclosures are used to prevent grounding and shorting; (b) plug housings are designed with non-conducting materials; conducting material such as brass was avoided to insure that workers would only handle materials that would have no electrical potential to ground; (c) energization of receptacles is not left up to the worker but is automatically accomplished when plugging in; all working mechanisms are located internally, protecting same from weather conditions, especially icing and personnel abuse.

Products are listed by Underwriters' Laboratories and comply with ABS and USCG rules.

Literature giving specific information is available upon request from **Walter Christiansen,** President, Marine Industrial Products Company, 195 Paterson Avenue, Little Falls, N.J. 07424.

MarAd Approves Application For Sabine Towing & Transp.

The Maritime Administration has approved the application of Sabine Towing & Transportation Co., Inc., Port Arthur, Texas, for Title XI mortgage and loan insurance in connection with building a 7,000-hp tug.

Main Iron Works, Inc., Houma, La. 70630 will construct the vessel, which will be used with a 28,000-ton oceangoing barge built by Bethlehem-Beaumont.

GRAFTON DREDGE-TENDER: Grafton Boat Co., Inc., Grafton, Ill., has delivered another of their 30-foot dredge tenders powered by a General Motors 6-71 with an Allison 2:1 gear. The vessel, Jackie, was built for Jackie's Marine Service, Empire, La., and is presently in service in that area towing material barges. She was delivered from Grafton's stock towboat production in less than three weeks from the time of order until the time it was working in Louisiana. The Jackie, 30 feet by 10 feet, by 3-feet 6-inches deep, swings a 28-inch 4-blade wheel in a tunnel with a total draft less than 3 feet fully loaded. The boat is equipped with main and flanking rudders powered by Vickers hydraulic steering. She is zinc coated outside with finish vinyl paints. **Edward D. Fry,** president of Grafton Boat Co., Inc., reports that they are finishing up another of their 30-foot towboats, along with a 40-foot twin-screw stock boat ready for immediate delivery, powered by diesel engines of the owners choice.

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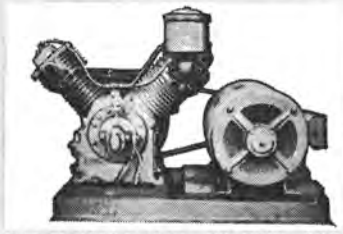

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JOY, 100 CFM, 300 PSI, 30 HP, 220/440/3/60.

INGERSOLL-RAND, 150 CFM, 600 PSI, 75 HP, 230 DC.

INGERSOLL-RAND, 60 CFM, 125 PSI, 15 HP, 230 DC.

WORTHINGTON, 142 CFM, 100 PSI, 20 HP, 230 DC.

HARDIE-TYNES, 30 CFH, 3000 PSI, 75 HP, 230 DC.

HARDIE-TYNES, 30 CFH, 3000 PSI, Steam Turbine Drive.

INGERSOLL-RAND, 30 CFH, 3000 PSI, Steam Turbine Drive.

WORTHINGTON, 30 CFH, 3000 PSI, Steam Turbine Drive.

WESTINGHOUSE AIR BRAKE, 246 CFM, 140 PSI, 50 HP, 440/3/60.

GARDNER-DENVER, 850 CFM, 100 PSI, 200 HP, 440/3/60.

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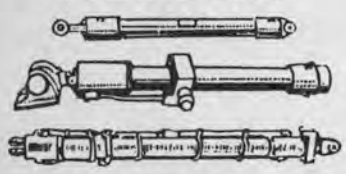

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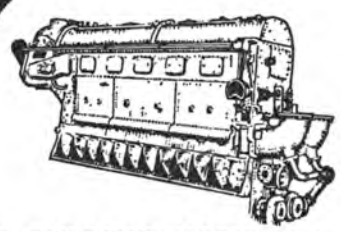
10"	26"	3.75"	58½"	single
2"	8"	1½"	20"	double
2.5"	15"	1.12"	25½"	double
3"	8"	1.37"	15½"	double
6"	8"	4"	144"	double
13"	9'7"	5½"	14'	double

MARINE DIESEL ENGINES



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Used condition, 1800 HP, 800 RPM, 2 cycle, 8-⅛" bore, 10" stroke, Air Start. Complete with Westinghouse Reduction Gears, 2.216:1 ratio—with hydraulic coupling.

3—COOPER-BESSEMER, Model LS-8-DR
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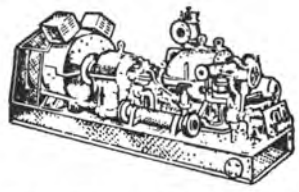
2—FAIRBANKS-MORSE Marine Diesel Engines. Model 38D8-⅛, 10 Cylinders, 1600HP, 720 RPM, 8-⅛" bore, 10" stroke, Air Start. Condition: Used, and Very Good. **$5000.00 each.**



TURBINE GENERATORS

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

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

TERRY, Type TM5, 440 PSI, 740°F, with Crocker-Wheeler Generators, 300 KW, 120/240 DC.

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

WORTHINGTON, Form S4, 440 PSI, 740° F, with Crocker-Wheeler Gen., 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, coupled to two Westinghouse Gen., 250 KW, 440/3/60 and a 90 KW, 120 DC.

GENERAL ELECTRIC, Type FN3-FN24, Steam 265#G, with G.E. Generator, 750 KW, 440/3/60.

WORTHINGTON, 225 PSI, 397°F, with Westinghouse Generator, 300 KW, 120/240 DC.

WESTINGHOUSE, 410 PSI, with Westinghouse Generators 200 KW, 450/3/60.

WESTINGHOUSE, 440 PSI, 740°F, with Westinghouse Generators, 300 KW, 240 DC.

GENERAL ELECTRIC, 525/618 PSI, with G.E. Generators, 200 KW, 450/3/60.

WESTINGHOUSE, 590 PSI, 487°F, with Westinghouse Generator, 540 KW, 120/240 DC.

GENERAL ELECTRIC, 410 PSI, with G.E. Generator, 200 KW, 450/3/60.

GENERAL ELECTRIC, 525 PSI, with G.E. Generator, 250 KW, 450/3/60.

GENERAL ELECTRIC, 525/618 PSI, with G.E. Generators, 438 KVA, 450/3/60.

WORTHINGTON, 225 PSI, 397°F, with Westinghouse Generator, 150 KW, 120 DC.

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

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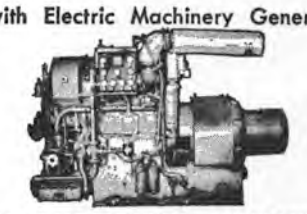
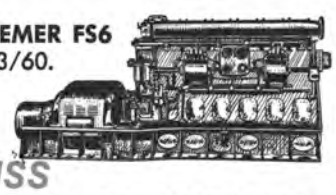
HILL, Type C, 10 KW, 120/240 DC.
HILL, Type B, 12 KW, 120/240 DC.
HILL, 4 Cylinder, 15 KW, 120/240 DC.
SUPERIOR, GA2, 10 KW, 120 DC.
HERCULES, DOOC, 10 KW, 120 DC.
CATERPILLAR, D3400, 15 KW, 120/240 DC.
BUDA, 4 cylinder, 15 KW, 120/240 DC.
HERCULES, DJXC, 25 KW, 120 DC.
CUMMINS, WA255, 30 KW, 120 DC.
P & H, 387C-18, 45/56KVA, 120/208/3/60.
BUDA, 6DH909, 40 KW, 115 volts DC.
GM, 4-71, 50/60 KW, 120/208/3/60.
CUMMINS, HDG, 60 KW, 120 DC.
BUDA, 6DHG691, 60 KW, 120 DC.
CUMMINS, 6 cylinder, 60 KW, 120/240 DC.



GM, 6067, 60 KW, 450/3/60.
BUDA, 6DC844, 75 KW, 125/250 DC.
CATERPILLAR, D17,000, 75 KW, 230 DC.
MURPHY, ME66, 75 KW, 240 DC.
LORIMER, F5SS, 75 KW, 240 DC.
CATERPILLAR, D17000, 85 KW, 220/3/60.
GM, 3-268A, 100 KW, 120/240 DC.
SUPERIOR, GBD8, 100 KW, 120/240 DC.
GM, 3-268A, 100 KW, 440/3/60.
SUPERIOR, 100 KW, 440/3/60.
LORIMER, F5SS, 100 KW, 440/3/60.

COOPER-BESSEMER FS6
250 KW, 440/3/60.



COOPER-BESSEMER
FS6, 250 KW, 440/3/60.
GM, 8-268, 300 KW, 345/260 DC.
GM, 6-278A, 300 KW, 120/240 DC.

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L. F. Gaubert & Co., 700 So. Broad St., New Orleans, La. 70150
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Oceanic Electrical Mfg. Co., Inc., 159 Perry Street, N.Y. 10014
Pauluhn Electric Mfg. Co. Inc., P.O. Box 12805, Houston, Tex. 77017

EVAPORATORS
Bethlehem Steel Corp., Shipbuilding, 25 B'way, N.Y., N.Y. 10004
Mechanical Equipment Co., Inc., 861 Carondelet St., New Orleans, La. 70130

FITTINGS & HARDWARE
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202
Robyon Backing Ring Co., 675 Garden St., Elizabeth, N.J. 07207

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

GALLEY RANGES
S. Blickman, Inc., 536 Gregory Ave., Weehawken, N.J. 07087
Elisha Webb & Son Co., 136 So. Front St., Philadelphia, Pa. 19106

HEATERS—Ship
Todd Products, Div. of Todd Shipyards Corp., Brooklyn, N.Y. 11231

HYDRAULICS
Bird Johnson Co., 883 Main St., Walpole, Mass. 02081
Bond Hydraulic Equip. Service, Inc., 117 Monroe St., Hoboken, N.J. 07030
Universal Hydraulics, Div. of Ohio Brass Co., 4500 Beidler Road, Willoughby, Ohio 44094
Vickers, M&O Div., Troy, Mich. 48084

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

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

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

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

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

MARINE NAVIGATION EQUIPMENT & AIDS
American Hydromath Co., 55 Brixton Rd., Garden City, N.Y. 11530
Edo Western Corp., 2645 So. 2nd St., W. Salt Lake City, Utah 84115
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016
ITT Mackay Marine, 133 Terminal Ave., Clark, N.J. 07066
Magnavox Navigation Systems, 2829 Maricopa St., Torrance, Calif. 90503
Marquardt Corp., 16555 Saticoy St., Van Nuys, Calif. 91406
National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo.
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.
Tracor, Inc., 6500 Tracor Lane, Austin, Texas 78721

MARINE EQUIPMENT
Adsco Div., 34 Milburn St., Buffalo, N.Y. 14212
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
Kearfott Marine (Div. of The Singer Co.) 21 West St., New York, N.Y. 10006
Chas. Lowe Co., 6340 Christie Ave., Emeryville, Calif. 94608
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742
Pacific Coast Eng. Co., P.O. Drawer E, Alameda, Calif. 94506
Stow Mfg. Co., 225 Shear St., Binghamton, N.Y. 13902
Vokes Filter Div. (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221

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

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

MARINE PROPULSION
Buehler Corp., 9000 Precision Drive, Indianapolis, Ind. 46236
Combustion Engineering, Inc., Windsor, Connecticut 06095
General Electric Co., Marine Turbine & Gear Dept., Lynn, Mass. 01910
General Electric Co., Gas Turbine Dept., Schenectady, N.Y. 12305
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171
Port Electric Turbine Div., 155-157 Perry St., New York 10014
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Western Gear Corp., Precision Products Div., P.O. Box 190, Lynwood, Calif. 90262

MARINE RADIO COMMUNICATIONS EQUIPMENT
Collins Radio Co., M/S 416-118, Dallas, Texas 75207
Communication Associates, Inc., 200 McKay Road, Huntington Station, N.Y. 11746
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016
ITT Mackay Marine, 133 Terminal Ave., Clark, N.J. 07066
Paul J. Plishner, 45 West 45 St., New York, N.Y. 10036
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
Raytheon Co. Marine Products, 676 Island Pond Rd., Manchester, N.H. 03103
RCA Service Co., A Division of RCA, Marine Communications and Navigation Equipment Service, Bldg. CHIC-225, Camden, N.J. 08101
RF Communications, Inc., 1676 University Ave., Rochester, N.Y. 14610

NAVAL ARCHITECTS AND MARINE ENGINEERS
BG Marine Services, Div. of Genge Industries, Inc., 4419 Van Nuys Blvd., Sherman Oaks, Calif. 91403
Best & Associates, 9870 S. W. 81 St., Miami, Florida 33143
Breit Engrg. Inc., 441 Gravier St., New Orleans, La. 70130
Coast Engineering Co., 711 W. 21st St., Norfolk, Va. 23517
Crandall Dry Dock Engrs., Inc., 238 Main St., Cambridge, Mass. 02142
Cushing & Nordstrom, 50 Trinity Place, New York, N.Y. 10006
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
Christopher J. Foster, 17 Battery Place, New York, N.Y. 10004
14 Vanderventer Ave., Port Washington, N.Y. 11050
Friede and Goldman, Inc., 225 Baronne St., New Orleans, La. 70112
Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110
Morris Guralnick, Associates, Inc., 583 Market St., San Francisco, Calif. 94105
J. J. Henry Co., Inc., 90 West St., New York, N.Y. 10006
L. K. Homyer, Box 408, Corona Del Mar, California 92625
C. T. Ilariucci & Associates, Tourism Pier #3, San Juan, Porto Rico 00902
James S. Krogen, 1460 Brickell Ave., Miami, Fla. 33131
Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460
Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567
Marine Applications Co., Inc., P.O. Box 167, Mineola, N.Y. 11502
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 1180 Ave. of Americas, N.Y., N.Y. 10036
Marine Design Associates, P.O. Box 2674, Palm Beach, Florida
Maritech, Inc., 38 Union Sq., Somerville, Mass. 02143
Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225
John J. McMullen Associates, Inc., 110 Wall St., N.Y., N.Y. 10005
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742
Robert Moore Corp., 350 Main St., Port Washington, N.Y. 11050
Gunnar Nelson, 2185 Lemoine Ave., Ft. Lee, N.J. 07024
Nickum & Spaulding Associates, 71 Columbia St., Seattle, Wash. 98104
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156
Philip L. Rhodes, Inc., 369 Lexington Ave., New York, N.Y. 10017
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 657 Mission St., San Francisco, Calif.
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007
T. W. Spaetgens, 156 West 8th Ave., Vancouver 10, Canada

R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wisc. 54235
Richard R. Taubler, 44 Court St., Brooklyn, N.Y. 11201
H. M. Tiedemann & Co., Inc., 74 Trinity Pl., New York, N.Y. 10006
H. Newton Whittelsey, 17 Battery Pl., New York, N.Y. 10004
Alan Winkley, 6420 Colby St., Oakland, Calif. 94618

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

OILS—Marine—Additives
Esso International Inc., 15 West 51 St., New York, N.Y. 10019
Ethyl Corp. Marine Div. Perolin Co., New York, N.Y. 10001
Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019
Humble Oil & Refining Co., Humble Building, Houston, Texas 77002
Mobil Oil Corp., 26 Broadway, New York, N.Y. 10004
Refineria Panama, S. A., 277 Park Ave., New York, N.Y. 10017
Shell Oil Co., 50 W. 50 St., New York 10020
Texaco, Inc., 135 E. 42nd St., New York, N.Y. 10017

PAINT—Marine—Protective Coatings
Ameron Corrosion Control Div., Brea, Calif. 92621
Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144
Devoe & Raynolds Co., Inc., Subsidiary Celanese Coatings Co., 414 Wilson Ave., Newark, N.J. 07105
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020
Farboil Company, 90 West St., New York, N.Y. 10006
International Paint Co., 21 West St., New York, N.Y. 10006
Mobil Chemical Company, Metuchen, N.J. 08840
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.
Woolsey Marine Industries Inc., 201 E. 42nd St., New York, N.Y. 10017

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

PLASTICS—Marine Applications
Ameron Corrosion Control Div., Brea, Calif. 92621
Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231
Philadelphia Resins Co., 20 Commerce Dr., Montgomeryville, Pa. 18936
Rotocast Plastic Products, Inc., 6700 N.W. 36th Ave., Miami, Florida 33147

POLLUTION CONTROL
Enjay Chemical Co., 60 West 49th St., New York, N.Y. 10020
Uniroyal, Inc., 10 Eagle St., Providence, R.I. 02901

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

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

PUMPS
Coffin Turbo Pump/FMC Corp. 326 So. Dean St., Englewood, N.J. 97631
Colt Industries, Inc., Fairbanks Morse Pump & Electric Div., 3601 Kansas Ave., Kansas City, Kansas 66110
M. T. Davidson Co., 1010 3rd Ave., New York, N.Y. 10021
Goulds Pumps, Seneca Falls, N.Y. 13148
Houttin-Pompen N. V. Sophialaan 4, Utrecht, Holland
Worthington Corporation, Harrison, New Jersey 07029

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American Engineered Products Co., Box 74, McKees Rocks, Pa. 15136
W. W. Patterson Co., 830 Brocket St., Pittsburgh, Pa. 15233

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

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American Mfg. Co., Inc., Noble & West Sts., Brooklyn, N.Y. 11222
Cating Rope Co., 309 Genesee St., Auburn, N.Y. 13022
Columbian Rope Co., 309 Genesee St., Auburn, N.Y. 13022
Jackson Rope Corp., 9th & Oley, Reading, Pa. 19604
Samson Cordage Works, 470 Atlantic Ave., Boston, Mass. 02210
Tubbs Cordage Company, P.O. Box 709, Orange, Calif. 92669
Wall Rope Works, Inc., Beverly, N. J. 08010

RUBBER PRODUCTS—Dock Fenders, Hose, Life Preservers
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Schuyler's Engineered Products Co., Box 87, Staten Island, N.Y.
Yokohama Rubber Co. Ltd., P.O. Box 46, Shiba, Tokyo 105, Japan

RUDDER ANGLE INDICATORS
Electric Tachometer Corp., 68th & Upland Street, Phila., Pa. 19142
Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

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

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

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

SEWAGE DISPOSAL
Seapax, Inc., 3645 Warrensville Center Rd., Cleveland, Ohio 44122

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

SHIPBREAKING—Salvage
The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202
National Metal & Steel Corp., 1251 New Dock St., Terminal Island, Cal. 90731
Northern Metal Co., Minor & Bleigh Sts., Philadelphia, Pa. 19136
Peck Equipment Co., 3500 Elm Ave., Portsmouth, Va. 23704
Zidell Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201

SHIP BROKERS
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N Y 10006
Oaksmith Boat Sales, Inc., Fisherman's Terminal, Seattle, Wash. 98119

SHIPBUILDING STEEL
Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh, Pa. 15219
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Bethlehem Steel Corp., 25 Broadway, New York, N.Y. 10004
Huntington Alloy Products, Div. International Nickel Co., Inc., Huntington, W. Va. 25720
International Nickel Co., 1 New York Plaza, New York, N.Y. 10004

SHIPBUILDING—Repairs, Maintenance, Drydocking
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042
Astilleros Espanoles, S.A. Zurbano, 70, Madrid 10, Spain
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150
Beliard Murdoch S. A., Kattendijkdok Westkaai 21, Antwerp, Belgium
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Blount Marine Corp., P.O. Box 360, Warren, Rhode Island 02885
Brodogradiliste "SPLIT", P.O. Box 107, Split, Yugoslavia
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Dillingham Corp., P.O. Box 3288, Honolulu, Hawaii 96801
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.
Equitable Equipment Co., Inc., P.O. Box 8001, New Orleans, La. 70122
General Dynamics, Electric Boat Division, 99M Eastern Point Road, Groton, Conn. 06340
General Dynamics, Quincy Division, Quincy, Mass. 02169
Gotaverken American Corp., 39 Broadway, New York, N.Y. 10006
Grafton Boat Co., Inc., Grafton, Ill. 62037
Groignard Shipyards, P.O. Box 829 Colbert, Marseilles, France.
Gunderson Bros. Engrg. Corp., 4700 N.W. Front St., Portland, Oregon 97208
Halter Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126
Havre de Grace, Havre de Grace, Md.
Hillman Barge & Construction Co., Grant Bldg., Pittsburgh 19, Pa.
Hitachi Shipbuilding Co.,25 Nakanoshima2-chomeKitaku,Osaka-Japan
Industrial Steel & Mach. Works, Inc., P.O. Box 2217, Gulfport, Miss. 39501
Ishikawajima-Harima Heavy Industries Co., Ltd., 15 William St., New York, N.Y. 10005
Jacksonville Shipyards, 644 E. Bay St., Jacksonville, Fla. 32203
Jeffboat, Inc., Jeffersonville, Ind. 47130
Kawasaki Dockyard Co., 8 Kaigan-dori, Ikuta-ku, Kobe, Japan
Kelso Marine, Inc., P.O. Box 268, Galveston, Texas 77550
Kockums Malmo, Fack, Malmo, Sweden
Levingston Shipbuilding Co., P.O. Box 968, Orange, Texas 77630
LISNAVE, P.O. Box 2138, Lisbon, Portugual
Litton Industries, 9920 W. Jefferson Blvd., Culver City, Calif. 90230
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134
Maryland Shipbuilding & Drydock, P.O. Box 537, Baltimore, Md. 21203
Matton Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047
Mitsubishi Heavy Industries, Ltd., 5-1 Marunouchi 2-chome, Chiyoda-ku, Tokyo, Japan
Mitsui Shipbuilding & Eng. Co., Ltd., Nihonbashi-Muromachi, Chuo-ku, Tokyo, Japan
Nashville Bridge Co., P.O. Box 239, Nashville, Tenn. 37202
National Steel & Shipbuilding Corp., San Diego, Calif. 92112
Newport News Shipbuilding and Dry Dock Co., Newport News, Va.
Northwest Marine Iron Works., P.O. Box 3109, Swan Island, Portland, Oregon 97208
Nuclear Service & Construction Co., Inc., 9296 Warwick Blvd., Newport News, Va. 23607
O.A.R.N. (officine Allestimento e Riparazioni Navi) Genoa, Italy
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Fla. 33156
Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501
Perth Amboy Dry Dock Co., Perth Amboy, N.J. 08862
Rodermond Industries, Foot of Henderson St., Jersey City, N.J. 07302
St. Louis Shipbuilding—Federal Barge, Inc. 611 East Marceau, St. Louis, Mo. 63111
Sasebo Heavy Industries Co., Ltd., New Ohtemachi Bldg., Chiyoda-ku, Tokyo, Japan
Sembawang Shipyard (Pte) Ltd., P.O. Box 3, Sembawang, P.O. Singapore, 27
Sumitomo Shipbuilding & Machy. Co., Ltd. 2-1 Ohtemochi 2-chome, Chiyoda-ku, Tokyo, Japan
Teledyne Sewart Seacraft, P.O. Box 108, Berwick, La. 70342
Todd Shipyards Corp., 1 Broadway, New York, N.Y. 10004

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

SHIP MODEL BASIN
Hydronautics, Incorporated, Laurel, Maryland 20810

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

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

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

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

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M. J. Batty & Co., P.O. Box 2316, Singapore, 1
Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002
Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202
Henry Gillen's Sons Lighterage, 140 Cedar St., New York, N.Y. 10006
James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004
Jackson Marine Corp., P.O. Box 1087, Aransas Pass, Texas 78336
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
McDonough Marine Service, P.O. Box 26206, New Orleans, La.
P. F. Martin, Inc., Mail Bldg., 325 Chestnut St., Philadelphia, Pa.
Moran Towing & Transportation Co., Inc., 17 Battery Place, New York, N.Y. 10004
L. Smit & Co., 11 Broadway, New York, N.Y. 10004
Suderman & Young Towing Co., 329 World Trade Center, Houston, Texas 77002
M. & J. Tracy, Inc., 1 Broadway, New York, N.Y. 10004
Turecamo Coastal and Harbor Towing Corp., 1752 Shore Parkway, Brooklyn, N.Y. 11214

VALVES AND FITTINGS—Hydraulic—Safety Flanges
Hubeva Marine Plastics-Lining, 435 Hamilton Ave., Brooklyn, N.Y. 11231
Hydrasearch Co., Inc., Riva Rd., Annapolis, Md. 21401
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696
Mechanical Marine Co., Inc., 900 Fairmount Ave., Elizabeth, N.J. 07207

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

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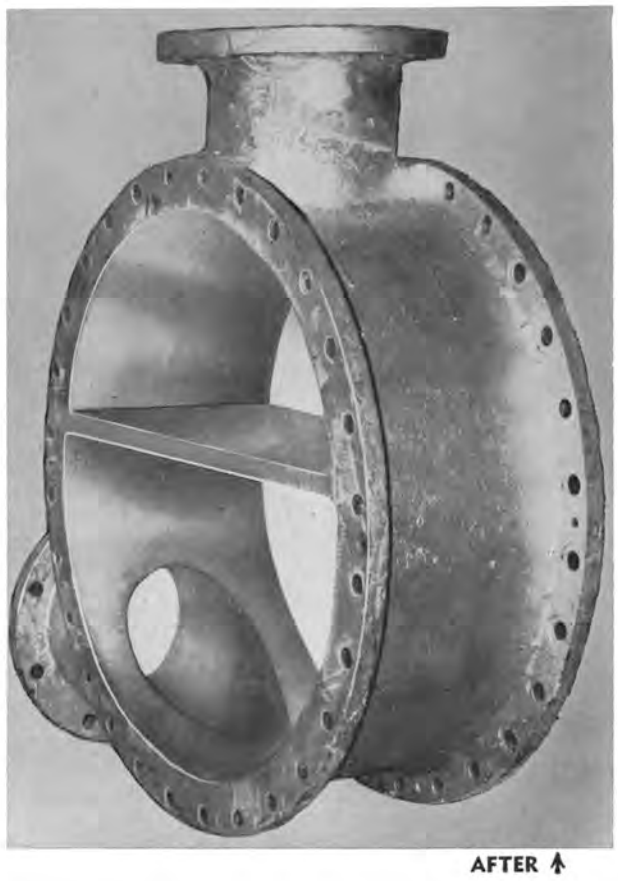

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