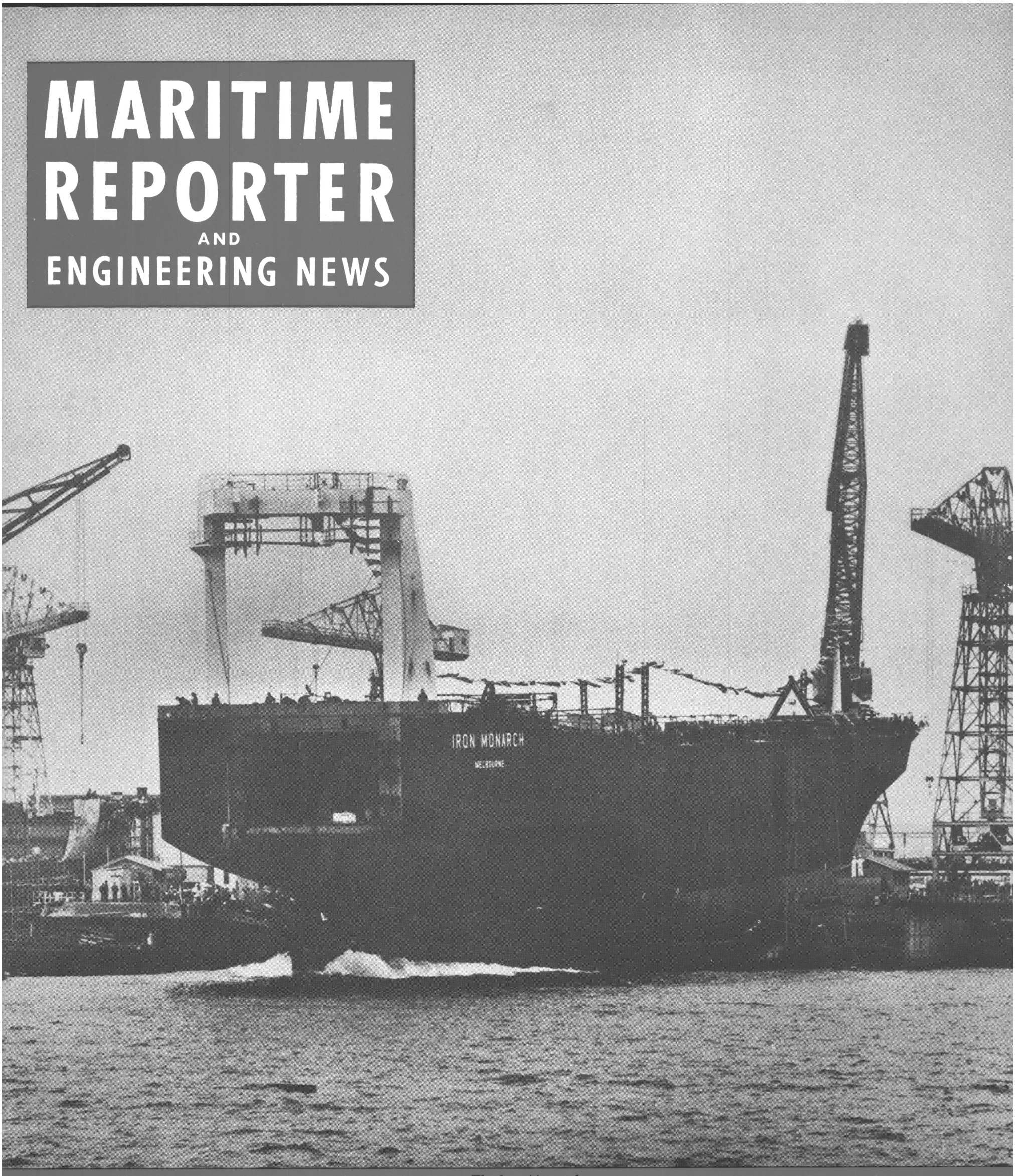
MARITIME
REPORTER
AND
ENGINEERING NEWS

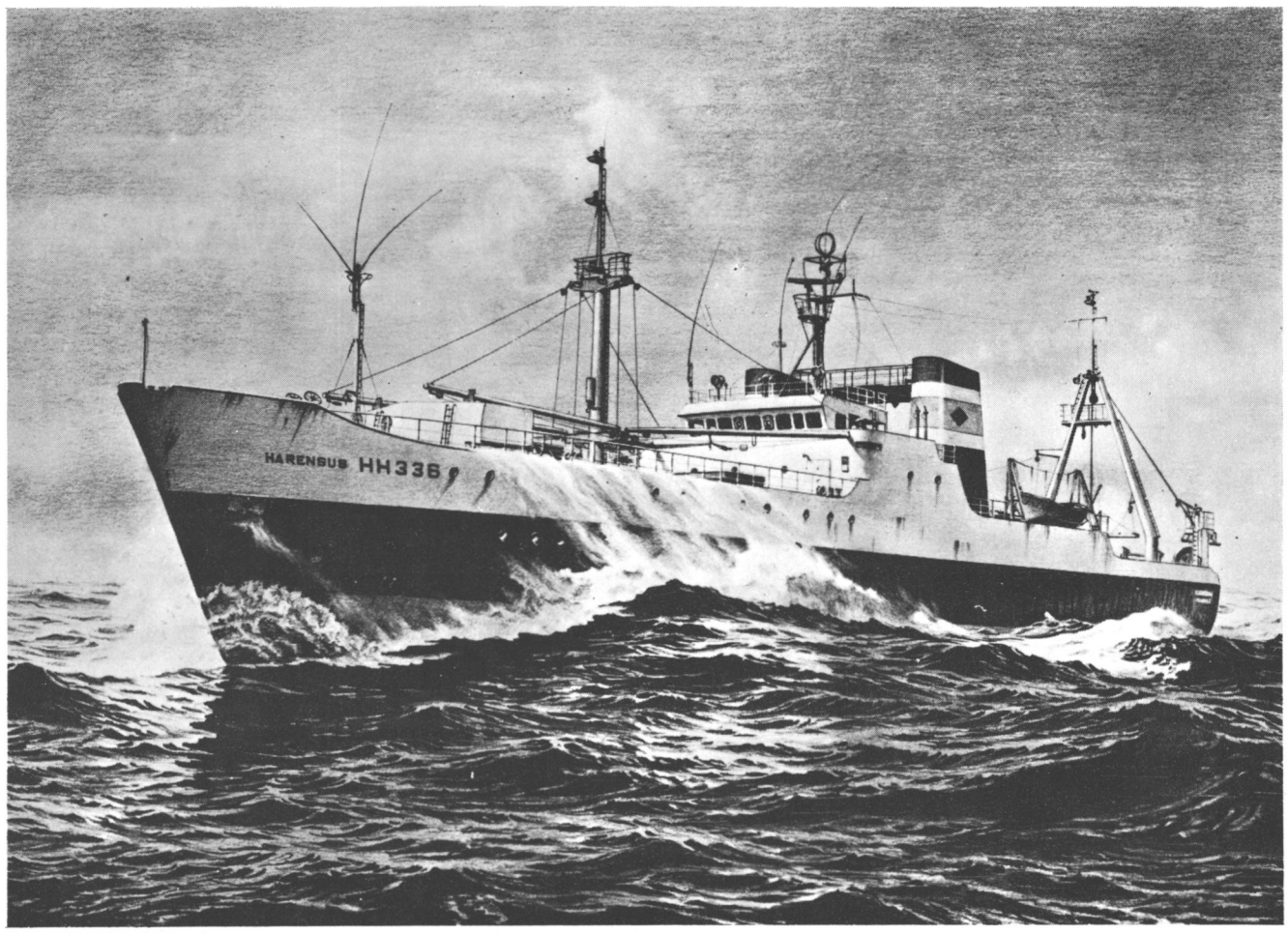


The Iron Monarch

Powered By GE Gas Turbines
BHP Whyalla Shipyard Builds
First Of A Kind Steel Transporter

(SEE PAGE 6)

MAY 15, 1973



Fish Factory Ship "Harengus"
Owners: Fock & Pickenpack, Hamburg; Builders: Norderwerft GmbH, Hamburg;
Propeller: Escher Wyss Controllable Pitch Propeller 3600 mm (11'10") dia designed for 4000 HP at 170 rpm.

(Drawing by J. Sachse, Hamburg)

PROPELLERS OF THE FUTURE

Fish Factory Ship "HARENGUS"

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To date 218 Escher Wyss controllable pitch propellers are in service or under construction for large fishing craft. All 14 fish factory ships ordered in 1970/71 from several German fishing companies at shipyards in Bremerhaven and Hamburg will be equipped with Escher Wyss propellers. About 20 other trawler propellers are presently under construction for owners in France, Iceland, Japan and the United Kingdom.
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M.I.T. Announces Sea Grant Program Summer Courses

The Massachusetts Institute of Technology's Sea Grant Project Office has announced the following special summer courses that will be presented by the Institute's Summer Session in cooperation with the M.I.T. Sea Grant Program:

Ship Structural Design (June 11-15). As with all preliminary system design, the initial (and often crucial) synthesis function is carried out by so few that its own unique demands are not likely to be widely appreciated. Therefore, this course is planned to give to all in the structural design chain an understanding of the principles involved and a recognition of the values to be adhered to. Prof. **J. Harvey Evans** of the Department of Ocean Engineering will supervise this course and also lecture.

Current Trends and Future Prospects of Ocean Engineering Structures, Materials and Fabrications (July 9-13). This course is designed to keep engineers and managers who are engaged in the design and fabrication of ocean engineering structures familiar with what goes on in this field in the world. This knowledge will keep them competitive in the international market. This course will be under the general direction of Prof. **Koichi Masubuchi** of the Department of Ocean Engineering.

Regional Analysis of Potential Offshore Petroleum Analysis (August 13-17). This course is planned to give public officials an opportunity to learn about the regional impacts of offshore oil—economic and environmental—from a source other than the oil industry itself. Prof. **John W. Devanney III,** project manager of the Georges Bank Study, will supervise this course.

Analysis and Design of Transportation Systems (August 20-24). The objective of this course is to provide a basic grounding in the concepts and techniques of transportation systems analysis. It will provide a wider perspective within the field and a progress report on recent research. Prof. **Marvin L. Manheim** and Prof. **Wayne M. Pecknold,** in association with other professors, will present this course.

For further information, contact M.I.T. Summer Session Office, Room E19-356, 77 Massachusetts Avenue, Cambridge, Mass. 02139.

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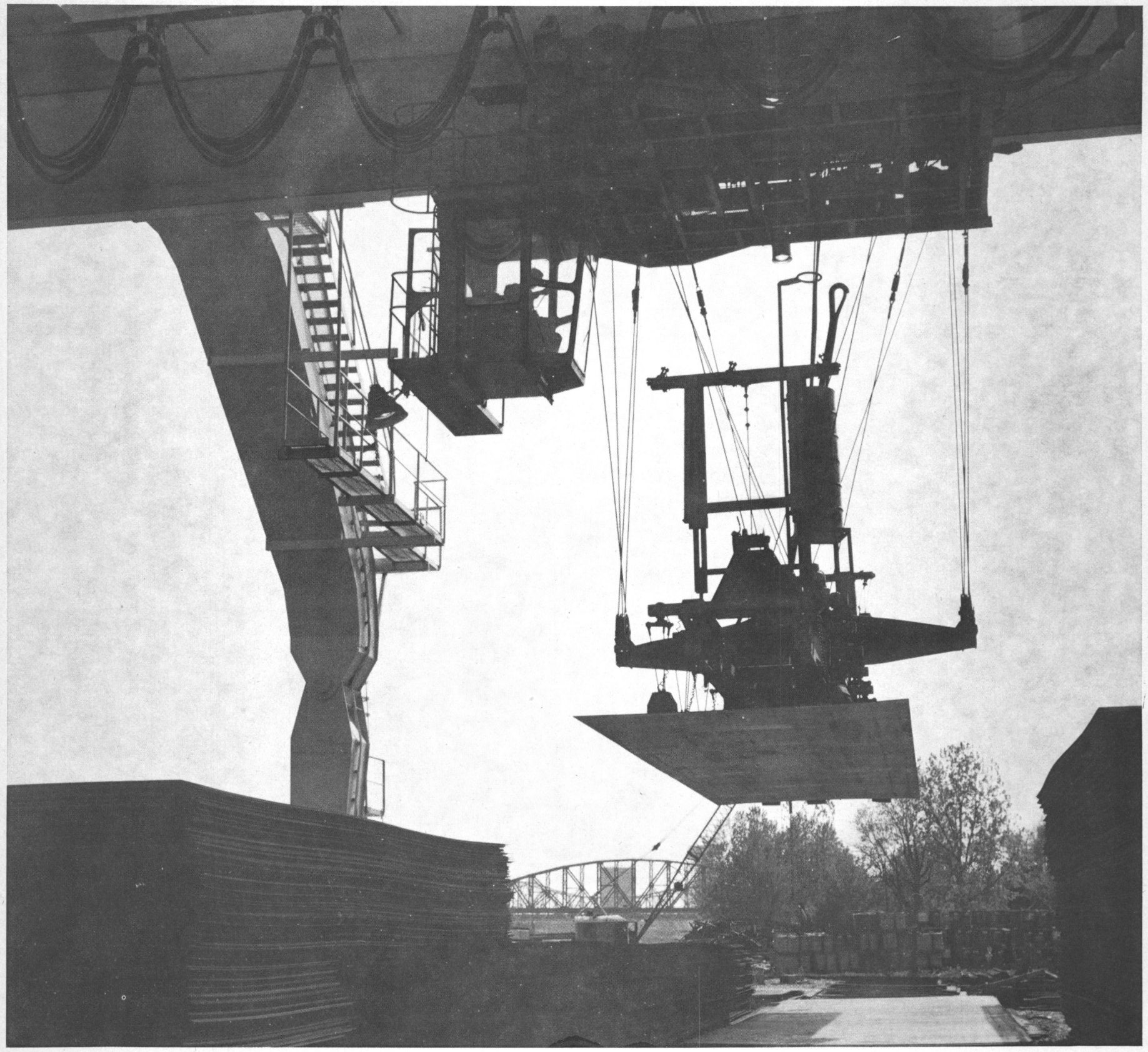

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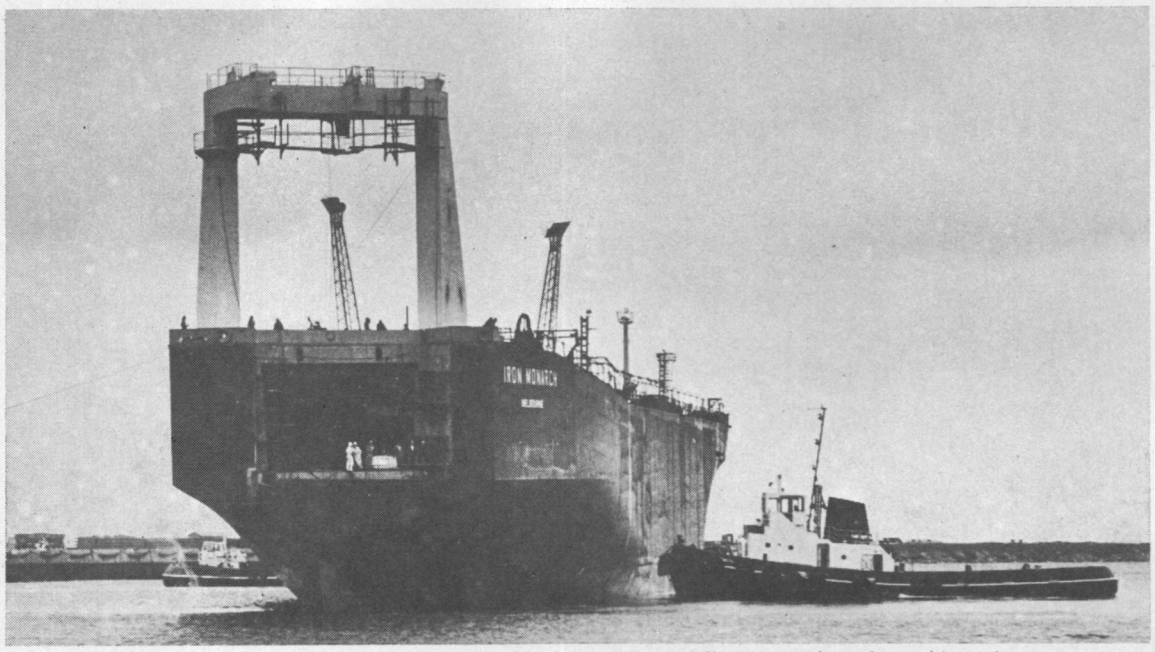


The Iron Monarch is guided to the fitting-out wharf following its launching. Note the canted stern door opening and gantry for the stern ramp to be used at normal wharves.

Australians Develop World's First Unitized Ro/Ro System To Transport Steel Products

Australia's only steel producer, largest miner, oil and natural gas producer, builder of the country's biggest ships, and operator of the largest privately owned shipping fleet, The Broken Hill Proprietary Company Limited of Melbourne, will introduce this year to the Australian industrial scene unitized transportation of steel products, based on the Ro/Ro system.

BHP transports more than 40 percent of its products by sea—a much greater proportion than overseas steelmakers. However, in recent years spiralling costs have tended to erode the advantages of long hauls by sea. The wide range of steel sections, sizes and qualities of finished steel products and the handling of small customer lots makes the loading and unloading of steel cargoes carried by ship less efficient than homogenous cargoes. The resulting lower ratio of vessel sea time to port time plus the rapid increase in stevedoring costs has eroded the cost advantage of long-haul transportation by sea.

In the continuing effort to develop the most economical means of transporting steel, BHP undertook a searching analysis of the movement of steel from the mill to the customer. The plan which emerged represents the first attempt in the world to implement a unitized Ro/Ro system for a full range of steel products.

The system initially will include two ships, bolsters (open containers), improved terminal facilities, specially designed handling equipment and systematic terminal storage and ship stowage arrangements. The cost of implementing the plan is some $31 million including $24 million for the two vessels.

The two 10,000-ton cargo ships are nearing completion at BHP's Whyalla shipyard.

General Electric Company's Gas Turbine Products Division in the United States manufactured the 19,000-hp Model 5000, regenerative cycle, two shaft heavy-duty gas turbine which powers each ship. These powerplants will provide a service speed of 20 knots under all load and weather conditions. The main cargo stowage areas are the lower hold and the vehicle deck—both completely enclosed. Straddle carriers will move the loaded bolsters from the terminal marshalling area to the vehicle deck via the ship's stern ramp. Shipboard overhead travelling cranes will stack the bolsters in cells in the lower hold. Bolsters also will be stowed on the vehicle deck.

In addition to the built-in cranes, three straddle carriers are carried on each vessel, making it independent of shore-based handling equipment. The 100-foot long articulated stern ramp is designed to allow the vessel to load and unload at a conventional berth.

The vessels represent considerable capital outlay, being larger than conventional vessels of similar lifting capacity and fitted with more powerful engines and costly equipment such as the stern ramp, watertight stern door and built-in overhead cranes. However, the investment was considered a necessary premium to pay to ensure rapid vessel turnaround, efficient stevedoring and proper protection for the cargo.

The type of bolster which will be used for most products is 20 feet long, 8 feet wide and 4 feet 3 inches high. Drop-down end walls and removable side walls are resigned to simplify the loading and unloading. Steel products will remain in the bolster from mill to distribution terminal.

Designed around a 30-ton all-up weight, this type has a tare weight of four tons and a maximum load capacity of 26 tons. With the end walls down, a bolster can carry structurals up to 60 feet in length. A locking device at each corner ensures stable stacking of the bolsters. Specially designed covers will be available for products such as tinplate which require protection from rain damage.

Two additional bolster types have been developed, one for wide tinplate coils and one for plate up to 106 inches wide.

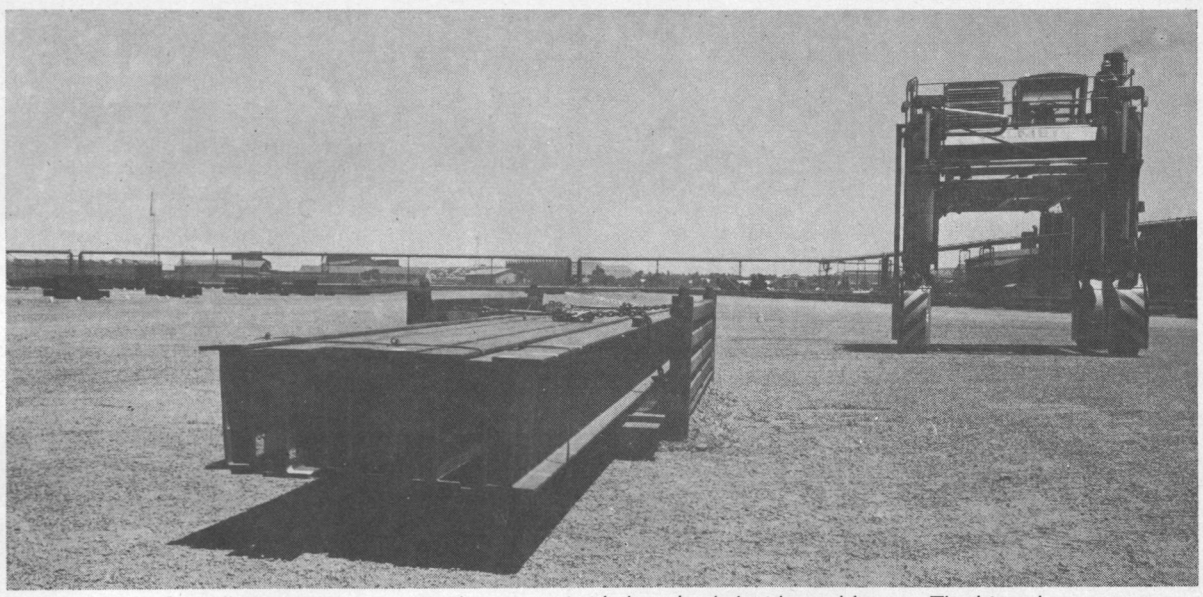
Covered storage sheds and marshalling areas will be available at Melbourne and Adelaide. Each bolster and contents will be identified and stored at the terminal and on the vessels in such a way as to enable loading and unloading in the most efficient and orderly manner possible. Bolster identification also will enable the programming of deliveries from the terminals.

Unloading a Ro/Ro vessel will be completed in one day and the cargo cleared from the terminal within three days of the ship's departure.

Each ship will have an overall length of 588 feet 3 inches, a length between perpendiculars of 553 feet 3 inches, a beam of 82 feet, a depth of 57 feet, and a loaded draft of 30 feet. The GE gas turbine drives a controllable-pitch propeller through reduction gearing. The designed output of this system is 19,000 shp.

The first of the two ships has been launched at the Whyalla Shipbuilding and Engineering Works. The first ship was christened Iron Monarch. The second ship will be named Iron Duke.

A Broken Hill Proprietary Company official stated: "Every aspect has been designed to fit into the total system."



Straddle carrier moves towards open-ended bolster loaded with steel beams. The hinged ends of the bolster have been dropped to allow carriage of beams up to 60 feet long.

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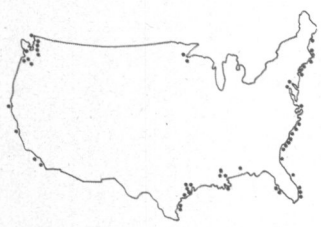

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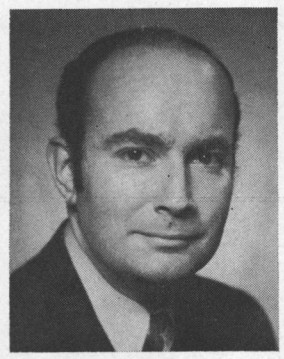
Joseph J. Cuneo Elected President Energy Transportation

Energy Transportation Corporation has announced the election of **Joseph J. Cuneo** as president and a director of the firm. The company has established its main offices at 540 Madison Avenue, New York, N.Y. Energy Transportation Corporation is a recently formed shipping company which, through its subsidiary Summit Marine Operations, Inc., will manage and operate the first liquefied natural gas carriers to be built in the United States at the Quincy Shipbuilding Division of General Dynamics.

The three LNG vessels will each have a capacity of 125,000 cubic meters of liquefied natural gas and will be owned and operated under the American flag. They are already committed on long-term charter to Burmah Oil Incorporated, which will utilize them in the transportation of liquefied natural gas from Algeria to the Northeastern United States.

Mr. **Cuneo** earned his master's degree with high distinction at the Harvard Graduate School of Business and his undergraduate degree with highest honors at the Webb Institute of Naval Architecture in Glen Cove, N.Y.

For the past four and one-half years prior to joining Energy Transportation Corporation, Mr. **Cuneo** was president of John J. McMullen Associates, Inc., a major international firm of naval architects and marine engineers. He has had extensive experience working with various Government organizations within a number of the energy-rich countries of the Middle East and South America. Mr. **Cuneo's** background also includes seven years of experience as vice president of a major international shipping firm wherein he was responsible for the design, construction and operation of a large fleet of tankers, bulk carriers and special purpose vessels such as LPG carriers and chemical tankers.



Joseph J. Cuneo

Mr. **Cuneo** stated that the founding of Energy Transportation Corporation has been based on the recognition of the growing energy importation and transportation needs of the United States and on the conviction that a well-managed aggressive independent American-flag shipping operation can and should play a meaningful role in fulfilling the requirements of the rapidly growing market. Mr. **Cuneo** stated that the founding of the company is positive evidence of the belief of its shareholders in the future of the American merchant marine.

Italcantieri Names Pacific Marine Corp. For U.S.A. And Canada

As part of a new policy of marketing and sales promotion abroad, Italcantieri—Italy's largest shipbuilding company—has appointed Pacific Marine Corporation, shipbrokers of 90 West Street, New York, N.Y. 10006, to represent them in the United States and Canada. Simultaneously, Pacific Marine (U.K.) Ltd., will represent them in the United Kingdom.

In recent years, Italcantieri yards have built a large number of vessels ranging from liquid gas carriers of 250,000-barrel capacity and tankers in the 230,000-dwt-254,000-dwt range, to ore and oil carriers, refined products carriers, containerships and multipurpose cargoships, down to ferries and drilling vessels, as well as naval construction, including submarines.

The present building program, incorporating the very latest construction techniques including the "working unit" concept which greatly speeds up the construction period, comprises 13 VLCC vessels between 253,000 and 315,000 deadweight tons and a variety of other ships, including four 80,000-dwt Panamax vessels.

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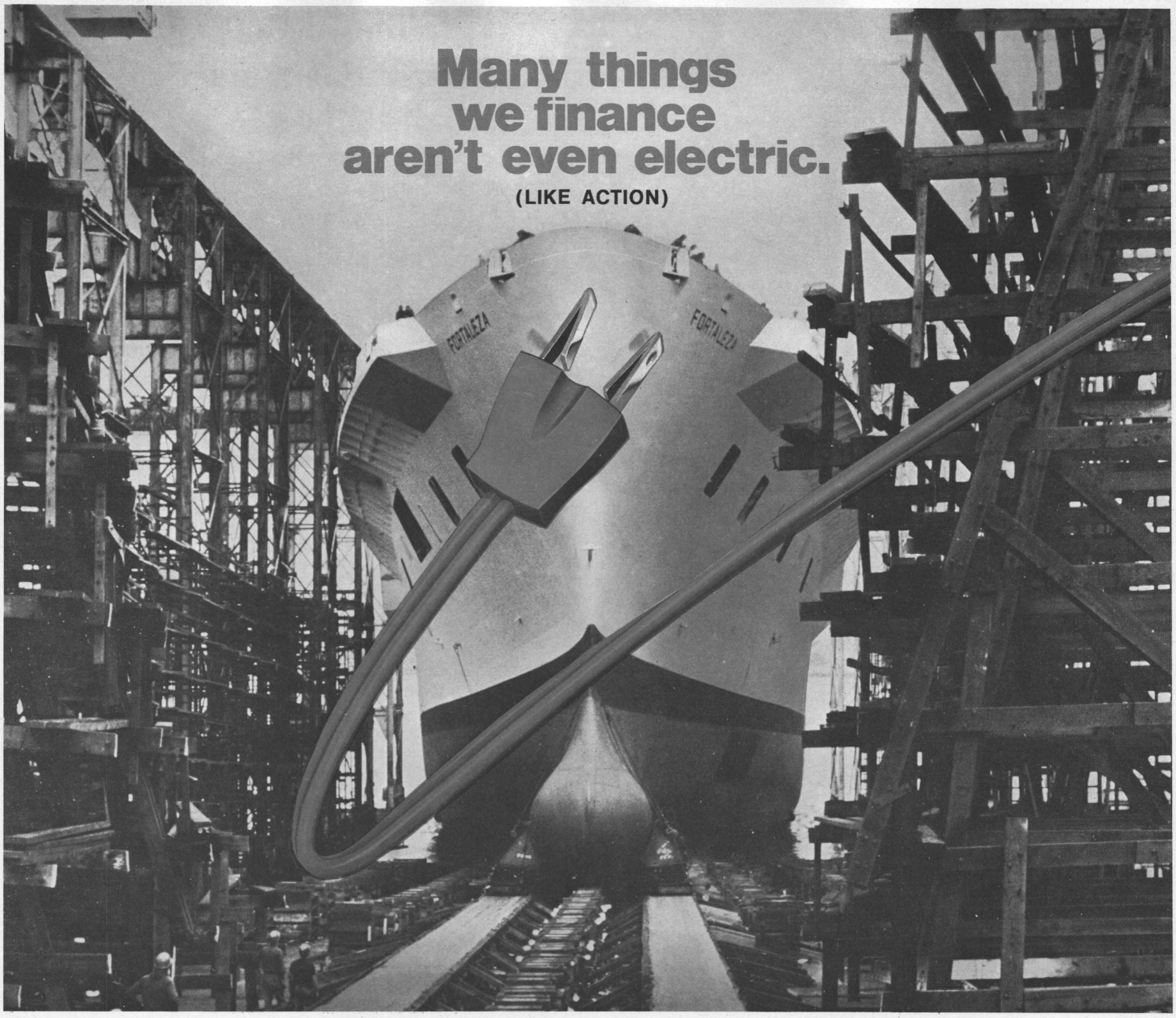

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The 21st Annual Fort Schuyler Forum Discusses

Corrosion Control, Tank Cleaning & Inerting

Corrosion control, tank cleaning and inerting, basically as relating to tankers, were the subjects covered during the 21st Annual Fort Schuyler Forum. These technical symposiums are sponsored by The Society of Marine Port Engineers, New York, N.Y., Inc., and the State University of New York Maritime College. The attendance at this year's forum exceeded those of previous years, which indicated the importance of the subjects covered to the marine industry.

Dr. **John J. Foody,** chairman, Department of Engineering, Maritime College, presided during the morning session, and **Philip A. Donahue,** Maritime Overseas Corporation, served in the same capacity for the afternoon session. Rear Adm. **Sheldon H. Kinney,** USN (ret.), president of the Maritime College, welcomed the attendees.

The 1973 Forum Committee consisted of Dr. **Foody** and **John Antonetz**, Texaco, Inc., as co-chairmen, and the following members: **Louis V. Minett,** American Bureau of Shipping; assistant professor **Jose Femenia,** Maritime College; Capt. **H.O. Travis,** U.S. Merchant Marine Academy; Mr. **Donahue; Joseph Thelgie,** Marine Transport Lines; **Harry H. Hunt,** marine surveyor; **Edward English,** Atlantic Repair Company, and **John C. Fox Jr.,** Esso International, Inc.

The following excerpts from the five papers presented indicate the depth and importance of the technical sessions:

Corrosion Protection
by
Robert J. Walton III
Wilson, Walton International Inc.

There are four basic methods to control corrosion attack of all metals. The naval architect, the builder, the owner and the operator can use these tools as the practicalities and the economics of the situation demand. These methods are:

1. Corrosion resistant materials.
2. Protective coatings.
3. Treatment of the environment.
4. Cathodic protection.

Each of these methods has certain adaptabilities and advantages, but significantly none are cure-alls. For the protection of many structures, the most effective and economical solution may be accomplished by using a combination of these methods. As an example, methods (2) and (4) were first used in the early 1930s for the protection of gas and oil distribution piping. At this time, these two methods are being used to protect the underwater hull and the inside surfaces of condenser and cooler water boxes.

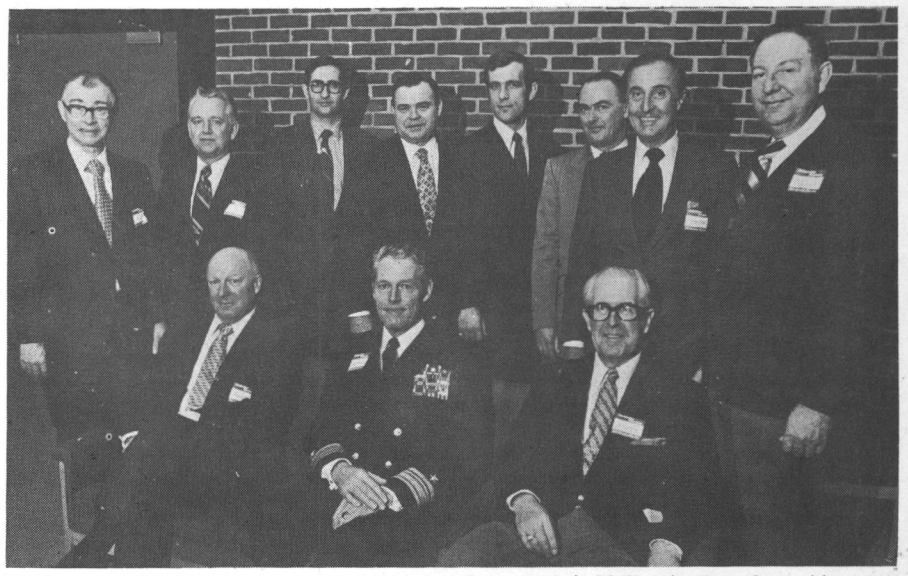
Corrosion of the external hull has been greatly retarded by the application of exotic coatings. Most of the established owners are using these coatings on all vessels, with the possible exception of smaller vessels where operation can result in periodic coating damage. To back up and prevent severe pitting attack at the breaks in exotic coatings, many owners are installing impressed-current cathodic-protection systems. A reasonable estimate of the number of impressed-current systems in use today would be three thousand. Nearly all newbuildings are being so fitted.

A properly designed, installed and maintained impressed-current system will permit an owner to extend drydocking from two years to two and a half years in accordance with Lloyd's Register 1968 Rules.

Impressed current is generally restricted to the external hull, its use not being permitted or its performance practical inside ballast tanks. No classification society would permit us to hang high-voltage anodes in a tank filled with explosive vapors and where chlorine gas would be caused to evolve in great quantities to corrode away the upper structure.

There are presently two basically different systems of impressed current available; both can do the job and both operate on the same principle, cathodic protection. The basic differences are in the choice of anode and half-cell materials, and the circuitry of the power package. The anode alloys available and most generally used are: lead silver, platinum clad on a base metal, and exotic coatings on a base metal. Each has its particular advantages and disadvantages.

Virtually all of the world's major shipyards are now familiar with impressed - current cathodic - protection systems as they are installing them in increasing numbers. Therefore, you will have no difficulties here once you have selected and purchased the proper equipment. "Tuning-in" the system and adjusting it for use prior to delivery after construction is the job of the supplier. Once your ship is at sea, the crew should only record daily readings of volts and amps. As operating problems occur, and they will, the supplier must be capable of furnishing men and parts on a world scale. The frequency of service should be less than once per year.



Taking part in the Forum were: (seated, left to right) **Philip A. Donahue,** Maritime Overseas Corp.; Rear Adm. **Sheldon H. Kinney,** USN (ret.), president, State University of New York, Maritime College, and Dr. **John J. Foody,** chairman, department of engineering, SUNY Maritime College; (standing, left to right) **Harry H. Hunt,** Marine Surveyor; **R.L. Doyle,** manager, technical sales and planning, International Paint Company, author; **Jose Femenia,** assistant professor of engineering, SUNY Maritime College, author; **John Antonetz,** Texaco, Inc., chairman, papers and technical committee; **Peter Quarterman,** marine superintendent, Dasic .International, author; **E.B. Budd,** chief engineer, Wilson, Walton International Ltd., author; **R.J. Walton III,** president, Wilson, Walton International Inc., author, and **Joseph Thelgie,** Marine Transport Lines.

Using cathodic protection in ballast tanks, the corrosion rates will be reduced to 30 percent of that experienced in unprotected tanks. If the average loss is 0.5 mm per year (washed two sides, immersed and unprotected), this rate will be reduced to 0.15 mm per year by use of cathodic protection in tanks. Thus, eliminating renewals for 20 years.

Marine Paints and Coatings
by
Robert L. Doyle
International Paint Company

The selection of the antifouling coating will depend upon the operating schedule of the ship. The strength of the antifoulings is determined by the toxic or active ingredients. In most cases, the main toxic for conventional antifouling is cuprous oxide. Based on the ship's service, it is conceivable that two and possibly three antifoulings may be needed on a single hull. But generally, when dealing with conventional or soft-type antifoulings, a regular antifouling or low-strength type is used on the flats and supertropical type from the bilge keel to the light loadline.

Assuming the anticorrosive paint, the aluminum-barrier coat, is doing its job, the repair schedule should be as follows after proper surface preparation: one touch-up coat of bituminous-aluminum barrier, one full coat (optional) of aluminum barrier, and one full coat of antifouling.

Although the full coat of bituminous-aluminum barrier coat is optional, it would be advisable to apply this every other drydocking, and more often if groundings warrant.

There are times when shipowners would like to extend their drydocking intervals, but are limited by the life cycle of the antifouling and/or the bottom requires continued attention due to the corrosive destruction of the underwater hull. However, this conventional-type bottom system need not be perpetuated because we can convert this bottom to a sophisticated high-performance coating system with the proper surface preparation and a selective high-performance coating system.

Converting to a high-performance coating system will provide an anticorrosive barrier that will virtually stop the corrosion process and with an adequate film thickness will minimize the roughness of the hull. Another benefit is the ability to use antifoulings with long-term protective properties. The adverse effect of roughness due to corrosion and fouling with respect on speed is of the

(Continued on page 13)

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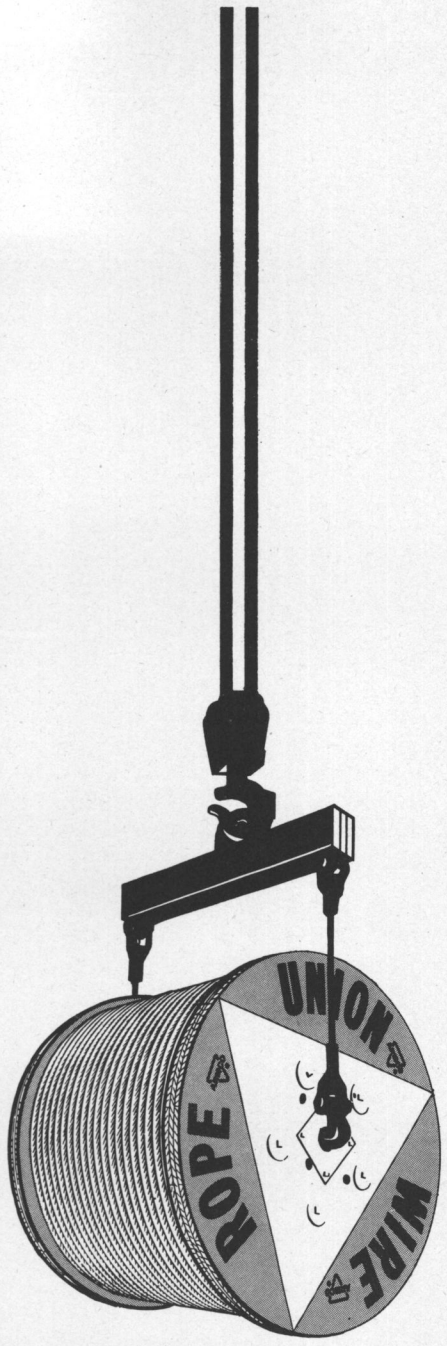

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ARMCO STEEL ARMCO

Fort Schuyler Forum Discusses

Corrosion Control, Tank Cleaning & Inerting

(Continued from page 11)

order of 6 percent per year. The effect on lost revenue can be alarming when measured in terms of days lost. A 10-day loss per year with a 300 operational day year when an average speed loss of 0.5 knot can be experienced.

There are two types of antifouling paints: the soft or soluble matrix, and the hard or insoluble matrix.

The soft and very often called the conventional-type antifouling is formulated with a resin that for all practical purposes is soluble in water. Since it absorbs a considerable amount of water when it is exposed to the air in dry dock or used in boottop band, it will contract on drying, resulting in cracking, flaking and otherwise detach itself from the anticorrosive. It is for this reason that most bottoms must be sand swept or high-pressure water blasted before renewal of the antifouling.

The hard or long-life antifouling is formulated with a resin that is insoluble. Along with these insoluble resins, a small amount of soluble resins are used to allow the toxic to leach from the film at a controlled rate. Since the hard type remains basically intact, they can be used in the boottop or waterline band to take the alternate exposure to wind and water and provide that much needed protection against the growth of grass or algae.

Cargo-Tank Cleaning System

by

Jose Femenia
State University of New York
Maritime College

This paper describes the work undertaken to develop a pollution-free cargo-tank cleaning system. The basic system developed is a closed tank-cleaning system using magnesium sulfate brine as the recirculated cleaning fluid.

After examining all of the practical techniques available and the requirements of the system, it was decided to develop a system relying on gravitational separation for the primary separation process and the possible use of one or more of the other techniques for refining the basic process. The main reasons for this choice were that it would be the most maintenance-free and compatible with the flow rates required for tank-cleaning operation on board tankers.

The results of this study show that closed tank-cleaning systems are feasible for use on tankers. The following are some facts that reinforce this conclusion:

1. Effective tank cleaning — 19.2 milligrams per square foot of tank surface when using 1.100 specific gravity magnesium sulfate brine at 100°F.
2. No pollutants will be discharged into the oceans.
3. System is inexpensive to operate —cost of replacing the estimated salt loss resulting in cleaning an 80,000-dwt tanker is $100.
4. Cargo-tank corrosion may be reduced.
5. All clingage oil will be reclaimed.

A closed tank-cleaning system would result in numerous advantages to tanker operators. Some of these are:

1. Cargo tank could be easily cleaned while the vessel is still engaged in discharging cargo. This could be accomplished without relying on shoreside facilities.
2. With clean tanks, the vessel could take on clean ballast water while still in protected waters.
3. Operators would not have to worry about the vessel's motion or crew errors when slop tanks or cargo tanks are decanted, as when using the load-on-top technique.
4. Once cargo tanks are cleaned of oil, some tankers could use their normally ballasted leg of the voyage to help solve the pollution problems of some municipalities. After cleaning tanks, the vessel could load secondary sewage sludge into their cargo tanks, carry it out to sea, and pump it overboard while under way. The tanks would then be rinsed with seawater in preparation for loading cargo oil.
5. System could be used to clean out machinery space bilges that are covered with oil. This would be accomplished by using a hand-held cleaning lance instead of the conventional tank-cleaning head. The fluid collected in the bilge would be returned to the separator. This mode of operation is not considered a normal mode, and after the system was used for this purpose, it might be necessary to discharge some of the contaminated (with salts other than magnesium sulfate), but oil-free, cleaning fluid overboard. In addition the cleaning fluid might require some chemical treatment.

As expected, the cleaning-pump power requirements increased as the density of the cleaning fluid was raised. The increase was 12 percent for the 1.100 specific gravity magnesium sulfate brine at 100°F when compared to fresh water at 100°F. It is therefore imperative to ensure that the pump prime mover is capable of supplying the additional power to the pump when converting the tank-cleaning system on an existing vessel to the proposed system.

VLCC Tank Cleaning

by

P. Quarterman
Dasic International Ltd.

Essentially the same problems are involved in VLCC cleaning as the problems encountered in smaller vessels, as far as types of cargo carried and differences in construction between vessels are concerned. The use of chemicals and the extensive equipment now available can help to ease the burdens in tank cleaning, brought about by the very considerable increase in the size of vessels and the reduction in manpower.

The invention of the fully orbital machine revolutionized tank washing. To date, no better type of machine has been produced, but improvements have been made on that first machine and some of them recently, like weight reduction, lower water consumption and increased power.

Basically, all orbital machines work on the same principle, an axial turbine which relies on the flow of water for drive power. The axial turbine reduces pressure at the nozzle of the machine. An advance by one company has been the removal of the turbine from the main flow of water, to give free access to the nozzles. The result is greater pressure at the nozzles. Other advantages are simpler gearing and complete flexibility of cycle time to suit any situation by simply changing a worm and wheel. Utilizing this equipment to clean a VLCC only puts greater pressure on the manpower. Further increases in the power of machines can only be achieved by increasing their size and weight. It has therefore been found necessary to devise equipment that diminishes the workload.

A disadvantage in the use of larger machines exists. In order to get a greater effective jet length, the cycle time of the machine had to be increased considerably, thus increasing the washing time. Detergent chemicals are available that will give a better job in a shorter time than with just hot or cold water and in this manner will reduce the total washing time.

In VLCC cleaning, chemicals are used on the same basis as in smaller vessels. With due regard for safety, the recirculation method of washing is no longer used. Chemicals are used on the "total loss" method. The chemicals are injected, either into the pressure side of the supply line on deck, with a pressure pump, or on the suction side of the supply line, at the pump in the engine room, with a simple transfer pump.

In recent years, some companies have installed permanent chemical storage tanks with a capacity for enough chemical to carry out three or four complete washing operations. A permanent line from the storage tank to the suction side of the supply line is also installed, with a pump and flow meter in the line, located on deck.

Many chemical companies maintain a staff of supervisors who are available to ride tankers during tank-cleaning operations.

Many companies have no policy for tank washing between drydockings. The results are often delays in an already extensive washing operation, when the vessel goes to drydock. The development of a systematic program of washing two or three extra tanks each time washing for clean ballast is carried out reduces the amount of sediment that will otherwise build up. In some cases, the use of chemicals in this type of cleaning is of advantage, since the wax in any scale and sediment can be greatly reduced, if not eliminated. The other advantages of such systematic programs are easier draining, less frequent cleaning of filters and mudboxes and less dead freight.

Inert Gas Systems

by

E.B. Budd
Wilson, Walton International Ltd.

There are clearly high risks attendant on the carriage of liquid hydrocarbon cargoes, the hazard depending to a great extent on the volatility of the cargo. An inert-gas system can reduce or eliminate this hazard.

In an inerted ship, the vessel would normally arrive at the loading terminal with tanks clean and the tank atmosphere inert gas. During loading, the inert gas would be displaced by the incoming cargo, venting to the atmosphere. Although hydrocarbon vapors would be emitted and the concentration of these vapors in the inert gas atmosphere would increase, the oxygen content would remain low and the atmosphere would be below the flammable range.

On the loaded passage, it might be expected that the pressure of inert gas in the tanks could fall due to leaks and, in fact, a graph of the tank pressure against time shows a descending sawtooth form. When the pressure falls below some predetermined limit, the tanks may be repressurized by a fresh supply of inert gas. At no time is the tank atmosphere unsafe, since its oxygen content must remain below the lower limit of flammability.

During discharging, inert gas is supplied to the cargo tanks in sufficient quantity to maintain an overpressure throughout the pumping operation. Unlike the non-inerted ship, all tank openings are shut in order to maintain the overpressure.

On the return passage, all tanks which contained oil, whether ballasted or not, will possess an inert atmosphere, and tank cleaning is carried out while this atmosphere is maintained. Normally, tanks are vented during this operation through purge pipes, or naturally through other openings, and a supply of inert gas is maintained to ensure a small overpressure. Again, the criterion of a low oxygen atmosphere is not violated during the operation.

The installation of an inert-gas system in new construction is a relatively simple matter. The size, weight and demands of the system are known, and provision can be made in the design stage to accommodate the equipment in the most effective and economical fashion, and full integration in the overall ship system is easily achieved. There are, however, a large number of tankers in service which are not fitted with inert-gas systems, but whose owners wish to enjoy the undeniable benefits of such a system. It should be remembered that inert gas is not a mandatory fit, and it is a matter of conjecture whether it will ever become a legal requirement.

Although basically simple in principle, the overall installation is essentially a system problem and one that requires not only an intimate knowledge of the mandatory requirements laid down by classification societies and national regulations, but an appreciation of their application to a particular ship and its operating procedures.

Mobil Shipping Orders Three Giant Tankers

Three giant tankers, two 274,000 tonners and one of 271,000 deadweight tons, will be built for Mobil Shipping and Transportation Company under contracts signed in New York.

The vessels are scheduled to be delivered in 1975. The twin 274,000 tonners will be built by Sumitomo Shipbuilding & Machinery Co. Ltd. at its Oppama shipyard. They will be the fourth and fifth ships to be built by Sumitomo for Mobil. The 271,000 tonner on order will be built by Sasebo Heavy Industries Co., Inc. It will be the seventh built for Mobil by Sasebo.

Each of the new vessels will be 1,115 feet long, and will have a speed of 16.5 knots. The Sumitomo vessels will have a beam of 178 feet and a depth of 88 feet, and each will be powered by a 38,000-horsepower steam turbine. The Sasebo vessel will have a beam of 175 feet, a depth of 91 feet, and will be powered by a 36,000-horsepower turbine.

$27.5-Million Shipyard Firm Formed In Taiwan

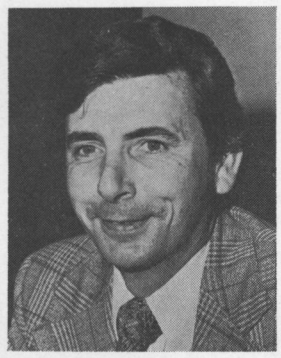
The Nationalist Chinese Ministry of Economic Affairs in Taipei has announced a new $27.5-million shipyard corporation that is planning to build a construction facility for 360,000-deadweight-ton tankers in southern Taiwan.

A venture of the Nationalist Chinese Government and private United States and Taiwanese business and shipping interests, the new China Shipbuilding Corp. will officially come into being in June, according to the reports. The Taiwan Government and local interests will control 55 percent of the new firm, with the remainder under Gata Oswego Corp., Camerna Navigation Corp., and the Associated Maritime Industries.

The new yard, to be built in Kaohsiung, is designed to deliver four of the 360,000-dwt-class tankers annually at a cost reported to be $50 million each. Spokesmen said that in addition to the construction of new giant-size vessels, the yard will repair some 2.5-million tons of shipping a year.

While the company is still to be formed officially, it reportedly has received 10 orders for the new tankers, the first of which will be launched in 1975. Construction of the facility will begin as soon as practicable, the spokesman said. "We will build the shipyard and start building the ship at the same time."

Jacuzzi Bros., Inc. Names Dave Norris Marine Accounts Rep



Dave Norris

Dave Norris has been appointed Eastern accounts representative for the marine products department of Jacuzzi Bros., Inc., Little Rock, Ark.

In addition to sales, he will provide specialized consultation to JacuzziJet customers covering various applications for its jet drive systems.

Mr. **Norris** recently joined Jacuzzi after working a number of years in sales and purchasing positions for pleasure boat manufacturers in Tennessee, Minnesota and Arkansas.

Naming Mr. **Norris** to the new position coincides with Jacuzzi's current expansion program on its "JacuzziJet" line of marine jet propulsion systems. The company manufactures jet drives in 12 to 36-inch stock sizes and larger units to customers' specifications.

American Ship Building Reports Record High Quarterly Net Earnings

The American Ship Building Co. of Cleveland, Ohio, has reported the highest quarterly net earnings in the company's 74-year history in the three-month period ending March 31, according to board chairman **George M. Steinbrenner III.** The earnings of $1,355,148 were some 24 percent above the same quarter one year ago, he said.

More power for you!

The CAPE CHARLES. First of the Blue Diamond Fleet's three new 3,300 horsepower twin screw tugs. Now operating in Hampton Roads. With two sister tugs, the CAPE HENLOPEN in Baltimore and the CAPE MAY, entering the fleet soon. These three powerful tugs are the latest of eight additions to the Curtis Bay fleet in the past five years. Solid evidence of Curtis Bay's commitment to offer you the finest equipment and the most reliable service. There is a difference in tugboat companies!

Curtis Bay Towing Company

Philadelphia □ Baltimore □ Hampton Roads

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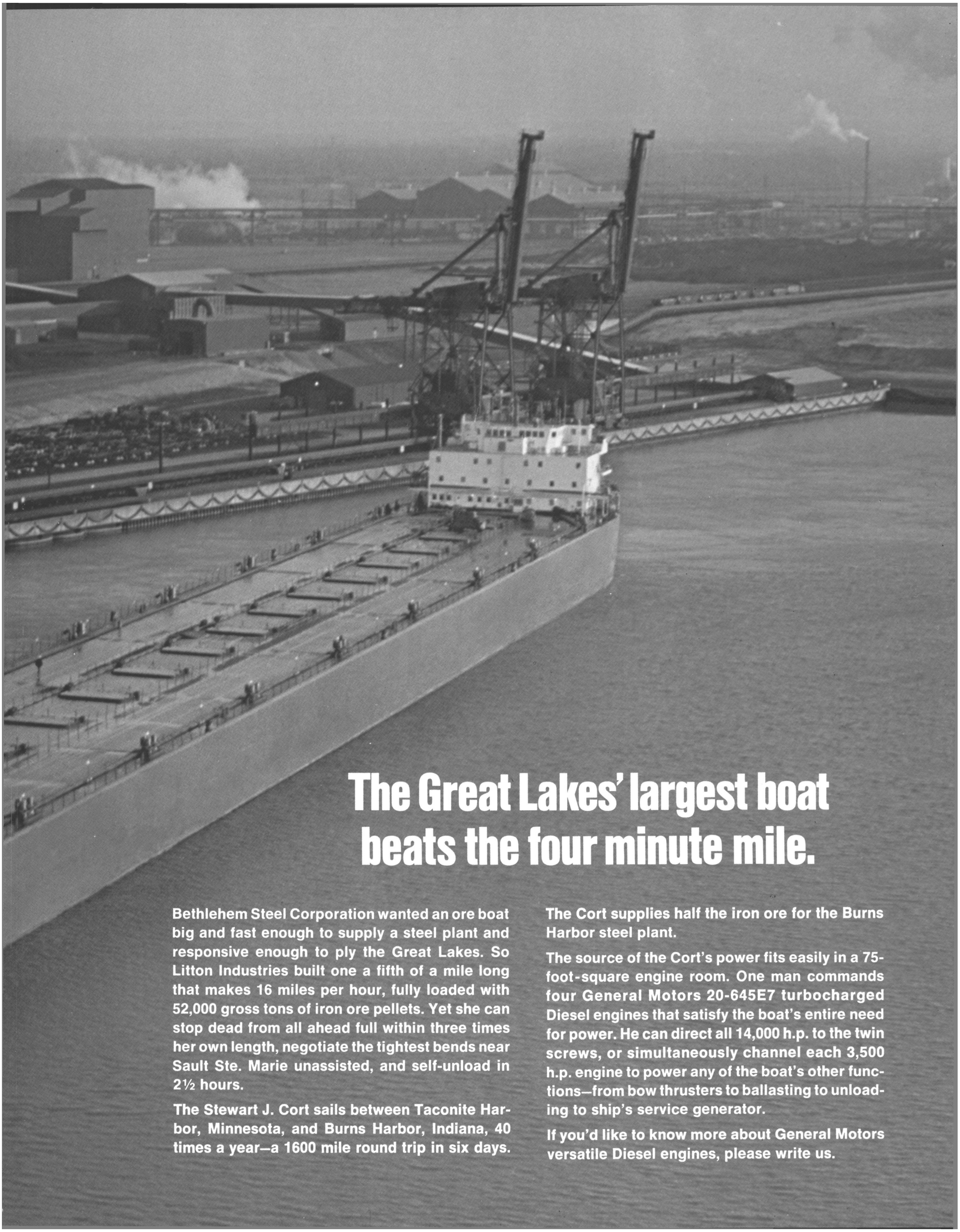
Electro-Motive Division
La Grange, Illinois



The Great Lakes' largest boat beats the four minute mile.

Bethlehem Steel Corporation wanted an ore boat big and fast enough to supply a steel plant and responsive enough to ply the Great Lakes. So Litton Industries built one a fifth of a mile long that makes 16 miles per hour, fully loaded with 52,000 gross tons of iron ore pellets. Yet she can stop dead from all ahead full within three times her own length, negotiate the tightest bends near Sault Ste. Marie unassisted, and self-unload in 2½ hours.

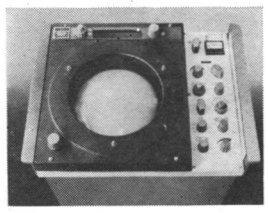
The Stewart J. Cort sails between Taconite Harbor, Minnesota, and Burns Harbor, Indiana, 40 times a year—a 1600 mile round trip in six days. The Cort supplies half the iron ore for the Burns Harbor steel plant.

The source of the Cort's power fits easily in a 75-foot-square engine room. One man commands four General Motors 20-645E7 turbocharged Diesel engines that satisfy the boat's entire need for power. He can direct all 14,000 h.p. to the twin screws, or simultaneously channel each 3,500 h.p. engine to power any of the boat's other functions—from bow thrusters to ballasting to unloading to ship's service generator.

If you'd like to know more about General Motors versatile Diesel engines, please write us.

Decca is more than just a radar company.

A lot more.

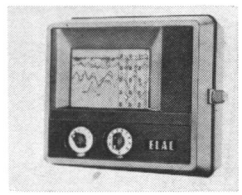


There are more than 50,000 Decca radar installations afloat. On merchant ships of just about every sea-going flag. And the navies of 48 nations. We developed the world's first practical commercial radar. The first anti-collision radar. The first true solid-state radar. The first economical small boat radar.

So ITT Decca Marine is a pretty exclusive radar company.

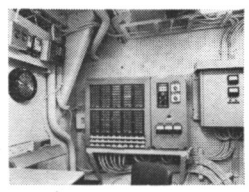
True. But we're not exclusively radar. For instance:

Our ELAC echosounding equipment. For fishing, navigation, oceanographic research. Including fishscopes—free-running and synchronous—that let you zoom in on any depth of water with just the right degree of discrimination. And models that let you see your way clear in shallow water or to depths of 36,000 feet.



Our radio line. Powerful VHF/FM models that let you get your message through, even under the most adverse conditions. Designed for ship-to-ship/ship-to-shore dependable communications networks. Ideal for harbor and nearby offshore requirements.

Our Decca Marine monitoring system. Completely modular and solid state. It looks for trouble on your ship...and finds it if it is there. Electronically. Before it becomes trouble. It monitors pressure, temperature, levels, etc. Up to 240 alarm points. Prevention...better than cure.



Our Decca Marine gyro/autopilot systems. For small fishing craft and giant supertankers. It will cut your fuel bill and increase your speed. It will cut the wear and tear on your engine, and free your helmsman for other work.

There's more. Because electronic navigational equipment that never breaks down hasn't been invented yet. So we invented the next best thing; a unique system of quality control, in every phase of production, that cuts the probability of equipment breakdown to a minimum. And we have developed the world's most extensive service organization—400 dealers, in every major port and most minor ones—completely equipped with Decca Marine spare parts for on-the-spot replacement as required. And staffed by factory-trained, experienced technicians and servicemen.

If you own a ship or a fleet, coastwise or offshore, fishing or harbor craft, it's a good idea to remember that Decca Marine is a lot more than a radar company. It could save you a lot of worry. And a lot of money.

Give us a call and find out how much.

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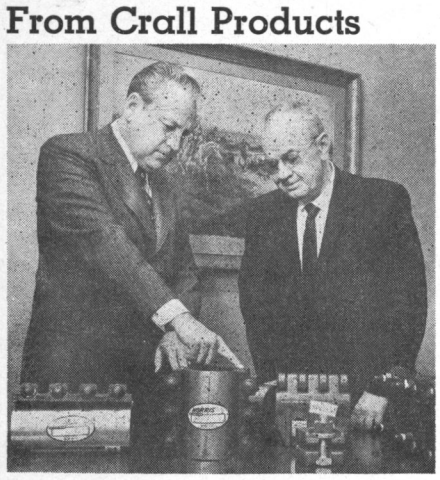
New York, N.Y. 10016
Tel. (212) 685-5157

World-Wide Awards 400,000-Dwt Tanker Contract To Hitachi

Y.K. Pao, governing director of World-Wide (Shipping) Ltd., has announced that a contract for the construction of a giant oil carrier has been completed with Hitachi Shipbuilding Company in Japan.

Mr. **Pao** stated that the 400,000-dwt tanker, when it is delivered in about four years, will become the biggest ship in one of the world's biggest independently owned ocean fleets. He also noted that this newest oil carrier will be owned partially by Eastern Asia Navigation Co., Ltd., one of the fleet companies within the World-Wide Group, whose shares are quoted on the Hong Kong Stock Exchange. Altogether, the World-Wide enterprise has some 40 supersize tankers on order.

Dover/Norris Purchases Three Product Lines From Crall Products



E.L. Bechtold (left), vice president of General Products and Pumps Group, discusses new products with Norris Division president **G. W. Davidson.**

G.W. Davidson, president of Tulsa, Okla.-based Norris Division of Dover Corporation, has announced the acquisition of three product lines from Crall Products, Inc. of Pampa, Texas. The product lines acquired, including the finished goods inventory, all tooling and patent rights, are sleeve couplings, pipe repair clamps, and polished rod clamps.

Norris, a division of Dover Corporation, is a manufacturer and marketer of sucker rods, butterfly and control valves, pumps and fittings for oil, gas, marine and industrial application.

Norris employs 700 people in Tulsa and has plants in Houston, Texas, and Edmonton, Canada, and licensees in Europe and Australia.

There will be no interruption of delivery, according to **E.L. (Ed) Bechtold,** vice president of the General Products and Pumps Group, and the transition is expected to be complete by next February 1. All manufacturing will be done in Tulsa.

D.P. (Paul) Hagaman, vice president-sales, said Norris will continue to serve Crall users as well as new customers through existing Norris oil field distribution and will explore expansion of new markets.

GE Turbines To Power Navy Patrol Frigate

Bath Iron Works has selected the GE LM2500 marine gas turbine to power the new U.S. Navy Patrol Frigate, according to an announcement made by GE's Marine & Industrial Department in Evendale, Ohio.

Two LM2500 propulsion modules will propel the 3,400-ton Patrol Frigate, now starting development at Bath. Each propulsion module develops 20,500 horsepower. The horsepower from the two modules will go through a combining reduction gear to drive a controlled and reversible pitch propeller.

An LM2500 module consists of the gas turbine, an acoustic enclosure, sound and shock-isolating mounts, and a lube oil storage and conditioning module.

Prior to construction of the lead Patrol Frigate, Bath will assemble a land-based test installation at the Naval Ship Engineering Center in Philadelphia, Pa. The installation will include two LM2500 modules, reduction gears and control system.

GE's Marine & Industrial Department is also supplying LM2500 modules for the DD963-class destroyers for the U.S. Navy, and LM2500 engines for the NATO / U.S. Navy PHM Patrol Hydrofoil.

Brazilian Yard To Build Three New Cargoliners For Netumar Fleet

To fulfill demands of its expanding services to North American ports, Netumar—the privately owned Brazilian-flag line — recently announced plans for a new series of cargoliners.

Under a contract with the Brazilian shipyard Estaleiro Maua, deliveries of three 14,600-deadweight-ton vessels are reportedly scheduled for March, May, and July 1975. The 528-foot-long general cargoships will be equipped with special features to facilitate year-round operations in the Great Lakes and St. Lawrence River waters.

The new vessels will provide greater cargo-handling capabilities (both container and breakbulk), as well as increased service flexibility on the three sea routes presently maintained with Brazil. Ice-strengthened hulls, for example, will enable Netumar to operate in the St. Lawrence River during winter months.

The three additions to the Netumar line will operate at service speeds of 17 knots, and will be powered by 11,500 - horsepower diesel engines. Equipped with booms capable of lifting as much as 60 tons and with five cargo holds and space to handle more than 250 containers of 20-foot lengths, they will provide Netumar with the capability to handle virtually any type of shipment between Brazil and Eastern United States and Canadian ports.

The Netumar line was formed in 1957 as a Brazilian coastwise carrier and entered international trade six years ago. The recently announced building contracts mark the latest steps forward in Netumar's continuing policy of growth and expansion. The line added its first newbuildings in 1970 and 1971, when five vessels were brought on berth. It now operates 22 ships of which 17 are wholly owned by the company.

Netumar International, Inc., general agent for the line in both the United States and Canada, is located at 67 Broad Street, New York, N.Y.

Litton Appoints Crosby M. Kelly Senior Vice President

Crosby M. Kelly

Crosby M. Kelly has been named a senior vice president of Litton Industries Inc., effective May 1, 1973, according to **Charles B. (Tex) Thornton,** chairman and chief executive officer.

Mr. **Kelly,** who resigned as a vice president of the corporation in 1965, rejoins Litton after eight years in his own management consulting firm, with headquarters in New York City and offices in Los Angeles, Calif., Brussels, Belgium, and Dusseldorf, Germany.

In his new position, Mr. **Kelly** will report to Mr. **Thornton** and will have executive responsibility worldwide for international relations, public affairs and corporate communications.

Litton, employing 114,000 people in 32 countries around the world, reported revenues of $1,303,-000,000 for the six months ended January 31, 1973.

Seatrain Lines Promotes Miller

John L. Miller has been promoted to vice president, southern California for Seatrain Line's Pacific services, according to an announcement by **Frank D. Troxel,** president.

Prior to his appointment to the newly created post, Mr. **Miller** was assistant vice president of operations, based at the line's Pacific headquarters at Oakland. Mr. **Miller** joined Seatrain in 1963.

Todd Reports Profit —Suspends Dividends To Permit Expansion

John T. Gilbride, president of Todd Shipyards Corporation, released highlights from the forthcoming annual report in a special letter to shareholders.

Sales for the year ended March 31, 1973, increased to $182,098,352 from $131,888,866 for the preceding year. Net income was $287,624—$0.19 per share—compared with a loss of $3,-119,134— $2.10 per share—for the preceding year, primarily attributable to increased ship repair activity.

As a result of the demands for huge supertankers (VLCCs or Very Large Crude Carriers) to meet the needs for energy, Todd is obligated to begin a costly expansion program for the future. The economic requirements of such a program will necessitate the suspension of dividends for the time being, according to Mr. **Gilbride.** This critical decision requires the company to break a consecutive 57-year record of quarterly dividend payments. Mr. **Gilbride** stated his optimism for the future, however, and pointed out that the projected magnitude of business for Todd during the next decade would more than double, presaging a period as great as any in the company's entire history.

Super Ocean Carrier Conference Scheduled Jan. 23-25 In N.Y.C.

The first international Super Ocean Carrier Conference (SOCCO) has been scheduled for New York City next January 23-25.

Plans for the conference, which will be held in the Americana Hotel, were announced by **Robert E. Apple,** chairman of the conference steering committee, and vice president of Alexander Marine Associates.

Mr. **Apple** said the conference will examine problems associated with the marine industry's trend toward million-ton ocean carriers —more than twice the size of the largest tankers in use today.

The chairman also announced the appointment of the first member of the SOCCO board of advisors—**Keith C. McKinney,** director of liquefied natural gas (LNG) projects for Southern California Gas Co., and vice president and general manager of Pacific Alaska LNG Co.

"The marine industry, in moving toward the million-ton ocean carrier, must carefully examine problems to be solved concerning structure, power, navigation, finance, construction facilities, ecology, insurance and safety," Mr. **Apple** said.

"These problems, which will be examined at the conference, are also applicable to the one-third to one-half-million-ton tankers now being constructed and operated, as well as the smaller but more expensive LNG tankers," Mr. **Apple** stated.

More than 35 papers will be presented on a cross section of topics dealing with designing, building and operating million-ton carriers. Other topics will include economic, technical and other advantages of of large carriers; logistic ramifications; port and harbor deepening; offshore loading facilities, and environmental considerations.

In addition to the technical program, there will be equipment and vessel design exhibits.

Other members of the SOCCO steering committee are **John Marriner,** consulting naval architect, former vice president of the California Shipbuilding Corp. and general manager of its predecessor company, Craig Shipbuilding Co., Long Beach; and **M.J. Richardson,** president of Symcon Marine Corp., and executive director of the World Dredging Conference Assn. (WODCON). WODCON is the largest international organization of the dredging industry.

Symcon Marine, which has been responsible for 12 major international conferences for WODCON as well as for the Offshore Exploration Conference (OECON), will manage the Super Ocean Carrier Conference.

Exhibit and technical paper information is available by writing SOCCO, Box 269, San Pedro, Calif. 90733.

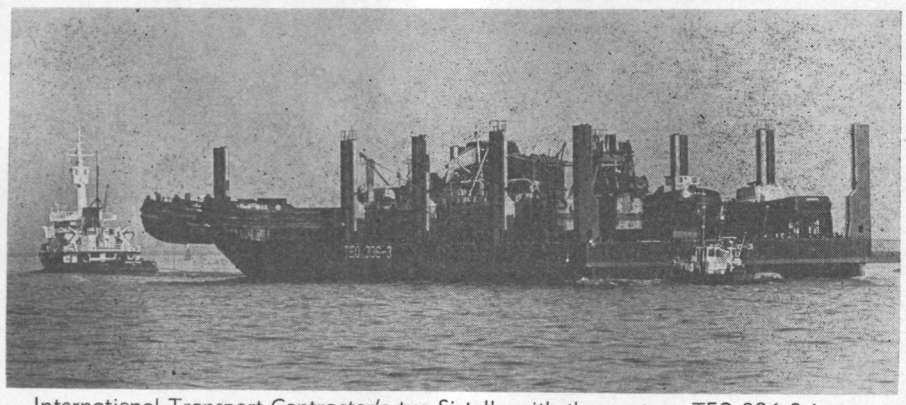
General American Plans To Acquire American Steamship

The General American Transportation Corporation, which supplies tank and other special types of railroad cars to shippers under lease and makes freight cars, has announced that it has agreed in principle to acquire the American Steamship Company for 200,000 shares of General American common stock and $45.4 million in cash and notes.

American Steamship, with headquarters in Buffalo, N.Y., owns and operates 14 bulk cargo ships on the Great Lakes transporting coal, grain, limestone and iron ore.

T.M. Thompson, chairman of General American, said the purchase price could be reduced on the basis of a formula related to future earnings of American Steamship.

ITC Of Holland Starts New Service Using Tugs And Submersible Pontoons To Transport Large Floating Equipment



International Transport Contractor's tug Sistella with the pontoon TEO 336-3 in tow heads to sea with a cargo of equipment assigned to Marseilles in a new operation.

Whether the cargo consists of coke, timber, grain, oil containers, pipelines, boilers, machinery or even complete drilling platforms, the combination of an oceangoing tug and one or more seagoing pontoons provides the answer to transporting it. With such facilities at their command, International Transport Contractors (ITC) B.V. of Amsterdam offer a system which, in addition to being unique in Europe, is extremely flexible and economical.

The principal benefits of using a single tug plus one or two pontoons accrue where the nature of the goods has so far prevented advantage being taken of modern methods of shipment. Cargo which is awkward to stow can easily be placed on a large, free deck area. Another remarkable facet of this method of transport is its safety—evidence of which is seen in the low insurance premiums demanded. The pontoons used have an extremely favorable draft, enabling them to be taken to virtually any harbor in the world to deliver or collect cargo.

The combination of a tug and seagoing pontoons also provides an ideal solution to the problem of transporting bucket or cutter dredgers, elevator barges, floating cranes and other items of dredging and civil engineering equipment to destinations abroad. The substantially higher towing speed results in considerable savings in time. If, for example, a harbor project abroad requires the dispatch of eight floating objects, three towages will be needed, since an oceangoing tug cannot tow more than three objects at a time. Using the huge seagoing pontoons which ITC have at their disposal, all eight objects can be transported in a single voyage using one tug.

To load equipment of the type envisaged, the pontoons are submerged and the dredgers, barges, etc. are floated into position above it. The pontoon is then refloated with the aid of compressors, whereupon the "cargo" is secured and other necessary provision made for the ocean voyage. The time and expense involved in preparing a tow for transport by this method is considerably less than would be required to prepare objects individually for an ocean towage.

Pictured above in the offices of ITC in Amsterdam are its directors, **L.P. Burghouwt** (left), and **F.J. Jonkman.**

Upon arrival at the destination, the pontoon is submerged until the objects float off. At this point, yet another advantage of the system emerges, namely that the equipment can be made operational more rapidly than would be the case if it were towed in the conventional manner.

During the first few weeks of their existence, ITC received many inquiries concerning ocean towages and salvage operations. The oceangoing tug Sistella carried out a voyage from Schiedam to Marseilles towing the 338 foot by 98 foot seagoing pontoon Teo 336-3 loaded with equipment owned by the Van Hattum en Blankeoort Baggeren B.V. The pontoon carried four elevator barges and a bucket dredger. These were loaded by submerging the pontoon. A crane finished loading the cargo by placing a tug on the pontoon. The tug and pontoon made the voyage to Marseilles in eight days, averaging a speed of 12 miles per hour.

The idea of this operation received immediate reception in Europe and ITC has been keeping its four pontoons and two tugs in continuous operation.

The Board of International Transport Contractors B.V., whose offices are located in the Mammoet Transport Building, Westerdokskijk 40, Amsterdam, consists of **L. P. Burghouwt** and **F.J. Jonkman.** Both directors have been closely involved with ocean towage and salvage for the past quarter of a century and were formerly associated with the Commercial Department of N.V. Bureau Wijsmuller of Ijmuiden.

Equitable Awarded $6-Million Contract For Tug Construction For Nolty T. Theriot, Inc.

Cecil M. Keeney, president of Equitable Equipment Co., Inc., left, and **C.R. Sanders,** executive vice president of Nolty J. Theriot, Inc., sign the contract in New Orleans.

Equitable Equipment Company, Inc., New Orleans, La., shipbuilder, has been awarded a contract of approximately $6 million by Nolty J. Theriot, Inc., international offshore vessel operator, to build three 149-foot 6-inch twin-screw 8,500-horsepower ocean tugs. They will be built to ABS Maltese Cross A-1, International Ocean Towing Service, Ice Strengthening Class C-1, Maltese Cross AMS Specifications. Each vessel will be fitted with Kort nozzles. The estimated total cost of the new tugs is $9.5 million.

The vessels will be constructed at Equitable's Industrial Canal Shipyard. This contract will increase Equitable's present backlog of construction to approximately $50 million.

Equitable is a wholly owned subsidiary of Trinity Industries, Inc.

MarAd Contract Awarded To Breit Engineering For Tank Barge Cost Analysis

Breit Engineering, Inc. of New Orleans, La., has been selected to perform life-cycle cost studies on various inland waterway tank barge designs for the Maritime Administration, it was announced by **Robert J. Blackwell,** Assistant Secretary of Commerce for Maritime Affairs.

The $51,000 fixed-price contract was awarded to Breit to determine life-cycle costs of five alternative tank barge designs, including single-skin, double-wall, double-hull, single-skin with increased scantlings, and single-skin with selected local strengthening.

Life-cycle cost estimates will be developed for tank barges with capacities of 1,200, 2,500, and 3,700 short tons.

Additional estimates will be made of the costs of retrofitting single-skin tank barges to the greater alternative design standards.

The Maritime Administration joined with the Coast Guard last July in a project to study the potential of various barge designs to reduce water pollution from inland marine operations.

In addition to the Breit contract, which will require about three months to complete, this effort includes development of a comprehensive profile of existing U.S. tank barges, examination of Coast Guard records on barge spills to determine the effectiveness of alternative designs in minimizing cargo losses following casualties, and assessment of other economic factors that would bear on a choice between barge designs.

Breit Engineering will be assisted by inland marine companies in acquiring necessary data to develop the cost estimates.

Diamond M To Place New Semisubmersible Rig In Gulf Of Mexico Service

Diamond M Drilling Company, Houston, Texas, reported gross revenues for the first three months of 1973 were $6,922,000, up from $5,198,000 for the same period of 1972. Income for the current quarter was 40 cents a share, or $713,000 for the period. This compares with 30 cents a share, or $523,000 for the first quarter of 1972.

Don E. McMahon, president and chief executive officer of the Houston-based drilling firm, said that Diamond M and a major oil company have reached an agreement on the principal terms of a one-year contract for the Diamond M Century. The Century is the company's new semisubmersible drilling rig, which is expected to be delivered by Alabama Dry Dock & Shipbuilding Co. in September of this year. The arrangement, which calls for the Century to be employed in the Gulf of Mexico, is subject to execution of a definitive agreement between the parties.

Commerce Secretary Addresses Dinner Of Nat'l Maritime Council

Secretary of Commerce **Frederick B. Dent** told guests at the second annual New York National Maritime Council Unity Dinner that the occasion "... attests to the new awareness on the part of the many diverse, and previously divided, maritime segments that the future growth of the U.S. shipping industry can best be achieved by unified, cooperative efforts to resolve problems."

Mr. **Dent** further stressed the need for industry-wide cooperation by noting: "Today, the United States still remains the leading nation in world trade, but in recent years other industrialized nations have effectively penetrated our export markets, and the American-flag fleet as a whole ranks a poor sixth in world fleet standings."

Mr. **Dent's** statement is a reworking of a fact that the NMC has sought to publicize and change —namely, that the participation of U.S.-flag vessels in this country's oceanborne commerce has fallen below 6 percent.

The NMC dinner, held April 4 at New York's Plaza Hotel, is one of a series at which shippers, as the guests of leading labor and management officials of the American merchant marine, are impressed with the importance of a strong U.S. merchant marine, and the need to boost the percentage of cargo carried on American-flag vessels.

Secretary of Commerce **Frederick B. Dent** is pictured as he spoke before the NMC dinner at the Plaza Hotel in New York City.

Other speakers at the dinner included **Laurence J. Buser,** president and chief executive officer of American Export Lines and chairman of the NMC's Eastern Region Action Group; **John P. Scally,** manager of export distribution for General Electric Company and chairman of the Shipper Advisory Group for the NMC's Eastern Region Action Group; **Paul Hall,** president of the Seafarers International Union, and Assistant Secretary of Commerce for Maritime Affairs **Robert J. Blackwell.**

The National Maritime Council is comprised of all segments of the U.S. maritime industry—management, labor and Government. The Council promotes programs to rebuild a strong and viable U.S. merchant marine capable of providing shippers with the finest and most consistently operated maritime fleet in the world.

Charles Smith Joins M & I Division Of Samson Cordage Works

Charles E. (Chuck) Smith Jr. has been named assistant sales manager for the Marine and Industrial Division of Samson Cordage Works, 470 Atlantic Avenue, Boston, Mass. 02210, according to an announcement by **Robert Billings,** vice president-sales.

In his new position, Mr. **Smith** will also have sales responsibility for M & I products in the Northeast region, including single and double braided rope systems for the commercial marine, utility, fishing, scientific, Government, oceanographic, and industrial markets. Rope sizes range from pencil-thin to 21-inch circumference, the world's strongest rope with a breaking strength in excess of 1,260,000 pounds.

Mr. **Smith** comes to Samson from a post as program coordinator for the U.S. Olympic NLM Department, and prior to that was sales representative for Proctor & Gamble Co. He is a graduate of Northeastern University, and attended graduate school at Roosevelt University.

Fruehauf Appoints Martin Glickman

Martin Glickman

Martin Glickman has been appointed sales manager-container equipment for the Fruehauf Division, Fruehauf Corporation, it was announced by **Clark E. Abbott,** vice president-container sales.

Headquartered in South Kearny, N.J., Mr. **Glickman** brings to his new post extensive experience in virtually every phase of container operation. Prior to accepting his new assignment, he had been container development representative for Fruehauf, servicing the firm's customers located along the Atlantic and Gulf Coasts.

As sales manager-container equipment, Mr. **Glickman** will function as a container consultant for steamship lines to aid and develop their ship and pier facilities. He will also be responsible for developing foreign and domestic accounts which are based in the United States, as well as be involved in container development and marketing programs.

Lake Carriers' Assn. Elects Three Trustees —Officers Reelected

Three Great Lakes shipping executives were elected trustees of the Lake Carriers' Association at its recent annual members meeting held in Cleveland, Ohio.

Elected to the 36-member board were **Elton Hoyt III,** president, Pickands Mather & Co.; **Floyd May,** vice president, Cleveland Tankers, Inc., and **Clare J. Snider,** marine manager, Ford Motor Company. Mr. **Snider** was also named a member of the association's advisory committee.

Reelected officers were Vice Adm. **Paul E. Trimble,** president; **Oliver T. Burnham,** vice president; **J.N. Carlson,** treasurer, and **Scott H. Elder,** general counsel. **John A. Packard,** formerly public relations director, was elected secretary.

Christian F. Beukema, vice president, Ore, Limestone and Lake Shipping Operations, U.S. Steel Corporation, and Prof. **Harry Benford,** The University of Michigan, School of Naval Architecture and Marine Engineering, were speakers at the board's luncheon at Cleveland's Union Club, prior to the business meeting. They reviewed developments in Great Lakes winter operations, which the shipping industry on the Lakes is pursuing in order to achieve an extended shipping season.

Magnavox Introduces Doppler Sonar Line

The Magnavox Company, 2829 Maricopa Street, Torrance, Calif. 90503, has developed a new line of advanced doppler sonar products for commercial marine, geophysical and oceanographic use.

The MX-660 Doppler Sonar Navigator is a high-precision stand-alone navigation system which provides exact measurement of ship's speed and distance traveled across the ocean floor. It is used primarily for survey, exploration and research.

The MX-880 Doppler Sonar Docking and Speed Log System was developed for commercial maritime use, with particular emphasis on large tankers, containerships and LNG carriers. This high-precision marine system measures ship's motion across the bottom (fore-aft speed), plus lateral velocity of the bow and stern independently, enhancing safety and efficiency of harbor channel maneuvering and docking.

Modern digital processing techniques are utilized to eliminate adjustments and calibrations associated with outmoded analog signal processing. This technique simplifies both installation and operation. Solid-state circuitry, with plug-in module construction, insures maximum reliability and permits easy maintenance by shipboard personnel.

MonArk Shipyard Delivers Icebreaking Boat And Barge

MonArk Shipyards, Inc., Pine Bluff, Ark., recently delivered a deck barge and a unique boat with elevating pilothouse to the U.S. Army Corps of Engineers.

The barge, designed and built for the Rock Island, Ill., District Corps of Engineers, features ⅜-inch deck plating and ½-inch knuckles for use in rock service, building and repairing wing dams and bank stabilization in the Rock Island District. The barge is 150 feet long, 35 feet wide and 7 feet deep, with a capacity of approximately 300 tons.

The boat was constructed for the St. Paul District Corps of Engineers. It measures 50 feet long, 20 feet wide and 7 feet deep. Heavy construction features frames only one foot apart in the bow section for icebreaking in the Mississippi River. The vessel is equipped with a unique elevating pilothouse to provide faster operations in the upper Mississippi where there are many outdated, low-elevation bridges. While the vessel has a maximum height of only 20 feet 6 inches in the down position, the operator's eye level at peak height exceeds 28 feet.

Built under the direction of **Robert L. Kappler,** general manager of MonArk Shipyards, the vessel was outfitted with the following equipment: the main engines are Caterpillar D343TA totaling 720 net shaft horsepower; generator sets are a matched pair of 30-kw Onan generators, powered by Ford marine diesels; shafting is 4-inch diameter with stainless steel sleeves, BJ rubber bearings and 48-inch by 44-inch four-blade propellers, Kahlenberg D-2 air horns, two Carlisle & Finch 14-inch drums, and remote control electric operated carbon arc lights.

A unique windshield arrangement provides floor to ceiling glass on the front of the cabin, allowing the operator to see the deck directly below with a totally unobstructed view of the make-up operation. Unlike most river towboats, it has no control console. The main and flanking controls, the searchlight controls, and the engine controls are all pedestal mounted on small pipes to minimize obstruction of the operator's field of vision.

The elevating pilothouse on the Otter affords the operator an eye level exceeding 28 feet at peak height.

The new vessel, which has been named Otter, will work around banks and dykes. It is equipped with MonArk's custom-designed grounding skegs which are designed to support the entire weight of the vessel if grounded.

During trials, the vessel pushed a 1,700-ton load at a speed of eight mph, exceeding the minimum requirements by 130 percent. The Government representatives that operated the boat during the river trials stated that the vessel handled and flanked better than anything in their present fleet.

Edward D. Fry, president of MonArk Shipyards, Inc., said that the shipyard is constructing a 74-foot work boat for the U.S. Navy, 20 pontoons, two landing barges, and two stock boats.

For more information, write **Ron K. Echols,** vice president-marketing, MonArk Boat Company, P.O. Box 210, Monticello, Ark. 71655.

Stern Access Equipment Technical Data Sheets Available From MacGregor

The USNS Comet was the first ro-ro cargoship designed specifically for this purpose. Built at Sun Shipbuilding and Dry Dock Company for the Military Sea Transportation Service, this ship's holds contain over 60,000 square feet of vehicle parking area, with loading and unloading being accomplished by means of oversized sideports, cargo hatches and ramps. For this unique ship, MacGregor and National U.S. Radiator combined their efforts in designing, developing and fabricating over 883 tons of diversified hydraulic equipment.

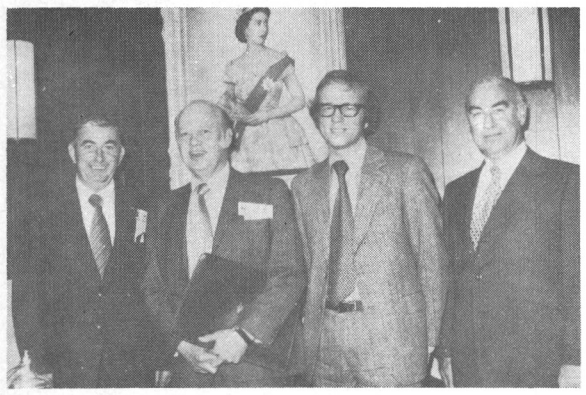
From this ship, the development of ro-ro ships has grown rapidly. As each new ro-ro ship enters service it shows the continuing developments made in transfer and access equipment. Some of these developments are described in the recent issue of MacGregor News. This special issue can be obtained from MacGregor-Comarain Inc., 135 Dermody Street, Cranford, N.J. 07016.

Port Of Catoosa Appoints R.W. Portiss

It has been announced by **Harley W. Ladd,** port director of the Tulsa Port of Catoosa, which is at the head of navigation on the Arkansas River System, that **Robert W. Portiss** has been named manager of traffic and sales.

Mr. **Portiss** was in charge of an economic development district in Wilburton, Okla., from 1971 to the time of his appointment to the Tulsa Port staff.

Pacific NW Section Discusses Shipboard Electrical Systems



Taking part in the meeting, left to right: **Jack Keene,** discusser; **William R. Lapper,** author of the paper; **Lewis Reinders,** discusser, and **Robert Cullen,** charman, British Columbia Area, Pacific Northwest Section of SNAME.

An especially deep and thorough coverage of the subject "Shipboard Electrical System Design" was presented on March 29 to members and guests of the Pacific Northwest Section of The Society of Naval Architects and Marine Engineers in Vancouver, British Columbia, by **William R. Lapper,** W.R. Lapper & Associates.

The author commenced by stressing that proper attention must be paid to electrical and electronic systems in the design stage. Of prime importance is the integration of the generation, distribution and utilization systems, and this is only possible by viewing the whole electrical and electronic picture while assessing the actual operating conditions.

Mr. **Lapper** then presented his format for listing all electrical requirements. The factors that emerge from his analysis are the estimated electrical load in kilowatts under varying operational conditions, as well as horsepower ratings of the larger electric motors.

In 1963, the author obtained approval from the Canadian Steamship Inspection Services for the feedback of electrical power from the emergency generator to the main switchboard, providing certain conditions were met. The first of these conditions was that the feedback of power would be limited to the capability of the emergency generator set and secondly, feedback of power would be interrupted in the event of the start-up of any of the emergency pumps normally powered from the emergency switchboard. These requirements were met by introducing two additional circuit breakers, labeled by the author as a "Tie-breaker" and a "Feedback-breaker," with suitable interlocks so that when one was closed the other would open.

In 1967, Mr. **Lapper** convinced the Canadian Steamship Inspection Service of the advantages of eliminating a central bank of transformers and instead, providing a series of small three-phase transformers, each mounted in its own sub-distribution panel, with a fixed number of double-pole, molded case, air circuit breakers. Two of the several advantages of this system are minimum of disruption should one transformer burn out, and reduction in feeder cable size due to the kVA demand being supplied at 440 volts.

The author feels shipyard personnel must appreciate the importance of integrating the electrical and electronic shipboard systems at the design stage in order that equipment suppliers may be able to bid on the most economical basis to provide a satisfactory solution to the problems. He also hopes that suppliers accept suggestions for modification and improvement which will result in more compact and better integrated installations.

Discussers were **Jack Keene,** Electrical Inspector, Department of Transport, and **Lewis Reinders,** Lewis & Associates Engineering, Ltd., firm of consulting engineers.

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MARINE ENGINEERING/LOG

OCCUPATIONAL BREAKDOWN OF TOTAL CIRCULATION

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

WORLD WIDE BUYING POWER TOTAL 8,610

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OCCUPATIONAL BREAKDOWN OF TOTAL CIRCULATION

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

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WORLD WIDE BUYING POWER TOTAL **13,559**

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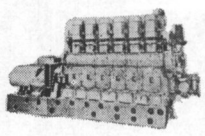
DIESEL GENERATOR SETS

250 KW DIESEL GENERATOR SET

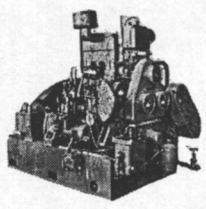
1 

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

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

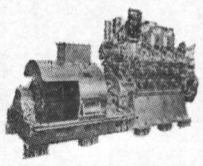
2 With switchgear. ENGINE: Radiator cooled Superior GBD-8—6 cylinder—1200 RPM GENERATOR: Electric Machinery Co.—120/240 volts DC—316 amps—1200 RPM—stab. shunt.

UNUSED 10 KW SUPERIOR DIESEL GENERATOR SET

3 

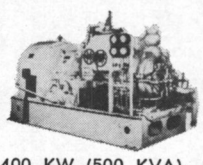
GENERATOR: Delco 10 KW—120 VDC—83.3 amps—1200 RPM. ENGINE: Superior diesel—2 cyl.—4½x5¾—15 HP—heat exchanger cooled.

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

4 

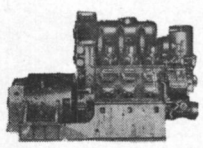
GENERATOR: Allis Chalmers—Compound wound. Has Class "A" insulation. Output 500 KW—120/240 volts DC—2080 amperes—720 RPM—drip-proof—self-cooling. Ambient 50°C—temperature rise 40°C. ENGINE: Model GM 8-278—2-cycle—Vee type—8½"x10½"—air starting—720 RPM. Complete with switchgear. Condition very good. Stilll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

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

5 

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

300 KW DIESEL GENERATOR SET

6 

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

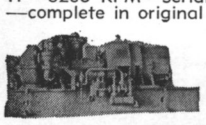
GENERATOR: G.E. 300 KW—120/240 volts DC—1250 amps—shunt wound—continuous overload rating 375 KW—2 hours—55° Weight of unit approximately 26,000 pounds. Complete with shock mounts. Unit 13' 2" long, 64" wide, 8' high.

TURBO GENERATOR SETS

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

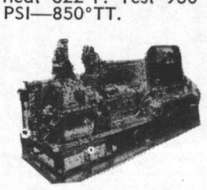
7 GENERATOR: 300 KW—240 VDC—1250 amps—1200 RPM. GEAR: 5286/1200—frame 6x15—serial 10A-2612-4. TURBINE: Frame C-325—225 PSI—397° TF—5286 RPM—Serial 10-A-2611-4. Wt. 16,700 lbs.—complete in original factory crate.

WESTINGHOUSE 440/3/60 200 KW UNIT

8 

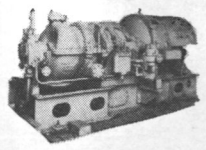
GENERATOR: Westinghouse 200 KW—250 KVA—450/3/60—1200 RPM—80% PF—with 40 KW—120 VDC on same shaft. GEAR: 9989/1200 RPM—double helical. TURBINE: Westinghouse—540 PSI—superheat 322°F. Test 930 PSI 800°TT. Also operate 615 PSI—850°TT.

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

9 

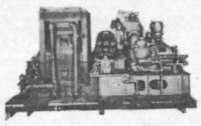
TURBINE: 525—615 PSI—850°TT—7938 RPM—10-stage—type FSN. GEAR: Single helix—7938/3600. GENERATOR: 1250 KW—450/3/60/3600—.80 PF—type ATB with surface air cooler. Overload 25%—2 hours—1563 KW.

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

10 

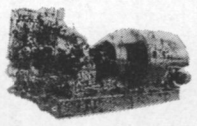
GENERATOR: 300 KW—120/240 VDC—1250 amps—1200 RPM. REDUCTION GEAR: 8.344:1—10012/1200 RPM—type S-182. TURBINE: DOR418N—449 H.P.—10012 RPM—working pressure 180/220 PSIG.

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

11 

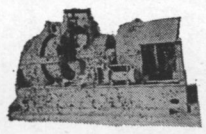
1962—DeLaval. Very little use. Completely preserved with rotors and diaphragms crated separately. TURBINE: DeLaval—585 PSI—840°TT—6-stage—6391 RPM—class CD—Also suitable 440 lbs.—740°TT—25" vac. GEAR: 6391/1200 RPM. GENERATOR: Allis-Chalmers—450/3/60. Totally enclosed, with static exciter and voltage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

AP2 VICTORY WORTHINGTON-MOORE CROCKER-WHEELER 300 KW UNIT

12 

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

VICTORY 300 KW WESTINGHOUSE TURBO GENERATOR SET

13 

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

UNUSED

CROCKER-WHEELER

500 KW

GENERATOR ENDS ONLY

14 **120/240 VOLTS D.C.—1200 R.P.M.**

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FOR USE ON NEWPORT NEWS VESSELS—HULLS 480 to 541 CLASS—SIMILAR TO ESSO LIMA CLASS

400 KW WESTINGHOUSE TURBO GENERATOR

15

TURBINE

835 lbs—840°TT—9018 RPM—instr. book 1430 CI—serial 5A-7090-7 and 5A-7090-8—6-stage.

REDUCTION GEAR

9018/1200 RPM

A.C. GENERATOR

400 KW—450/3/60/1200 RPM—rise 40°C—100% and 58°C—125%. In book 5442. Serial 3S-35P792 and 4S-35P792.

EXCITER

5.5 KW—125 volts—shunt wound—frame 6-83—44 amps.

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16 SPARROWS POINT 4400-4500 SERIES
QUINCY 1600 SERIES HULLS

28,000 GT/29,000 GT
ONE H.P. TURBINE—BUILT 1949
600 LBS.—860°F—SHAFT
HORSEPOWER 6150 AT 4773
RPM—SERIAL #1630-H-4

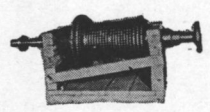
6690 H.P. HIGH PRESSURE 7-STAGE TURBINE

17 **ORIGINALLY BUILT FOR**
ESSO CHRISTOBOL—NEWPORT NEWS
6690 H.P. AT 7862 RPM
PRESSURE 835 LBS GAUGE
TEMP. 840°F—SERIAL 83343

FOR EMERGENCY USE

In an emergency, this HP turbine could substitute for Newport News built HP with piping and foundation change.

19 STAGE WESTINGHOUSE H.P. ROTOR FOR AP2 VICTORY

18 

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

8500 H.P. G.E. TURBINE

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

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

NEW L.P. BLADE RINGS

20 **for large 8500 H.P. Victory**

Joshua Hendy Westinghouse

SPECIAL!

1 WESTINGHOUSE COMPLETE T-2 MAIN TURBINE

21 **PROFILE (UNSHROUDED)**
6600 HP—435 PSI—750°F
28" VAC.—3720 RPM

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

IMMEDIATE DELIVERY—WITH ABS

'ON METALS CO.

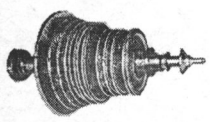
ORE ST. • BALTIMORE, MD. 21202

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

22 **NEW 8500 H.P. G.E. TURBINES**

H.P. & L.P.

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

23 

T2-SE-A1 MAIN PROPULSION ROTOR — G.E.

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

2 COMPLETE T-2 G.E. TURBINES

24 #61818 and #61834—large Lynn—all stages magnafluxed.

ROTOR WILL INTERCHANGE WITH ELLIOTT MAIN TURBINE

25 **9500 H.P. G.E. — C-3 OR VICTORY**

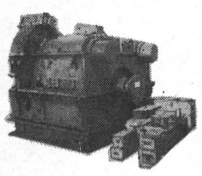
H.P.—8-stage—6159 RPM—serial 62043
L.P.—8-stage—3509 RPM—serial 62042
G.E.I. 16263

26 **6000 H.P. G.E. — NORTH CAROLINA C-2**

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

27 **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 valv

28 

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

MD-48A—8500 HP—6159/3509/763/85 RPM.

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

Westinghouse 4A-1640.

T-2 TANKER
UNUSED—4 UNITS AVAILABLE

30 **AUX. G.E. TURBO GEN. ROTORS**

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

PUMPS

INGERSOLL-RAND BRONZE CARGO PUMPS ONLY

31 Bronze Ingersoll-Rand 10GT cargo pumps only—without turbine. 4500 GPM at 125 lbs—2-stage—14"x12".

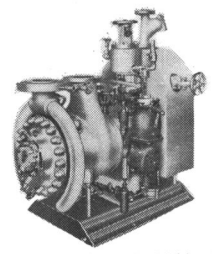
CARGO PUMP TURBINES

32 **WHITON**

Direct drive—type BDS—500 HP—835 lbs at 0° superheat. Exhaust 12" Hg. Will operate at 455 PSIG—599°TT—4 PSI exhaust. Can be used with 10GT Ingersoll-Rand pumps.

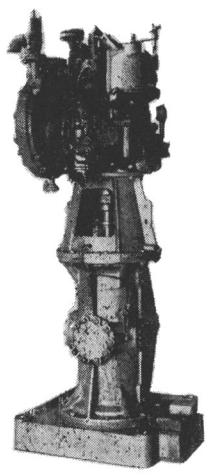
WESTINGHOUSE

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

33 

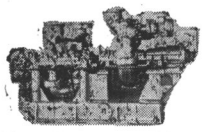
COFFIN TYPE D.E.B. TURBO FEED PUMP

CAPACITY: 350 GPM—2600' total head. Steam 845 PSIG—temp. 575°F TT—exhaust 42 PSIG—HP 396—RPM 8030—rated design 10,000 RPM. Serial #51-143-37. Suitable for Tankers 25,000 GT and up.

34 

UNUSED DELAVAL 24.5 H.P. LUBE OIL PUMP

Turbine-driven main lubricating oil pumps — vertical rotary with horizontal worm geared turbine drive. 575# Steam pressure—5000 RPM—15# back pressure. GEAR: 5000/1035 RPM. PUMP: 550 GPM at 50 PSI—suction lift 10.0". Suitable for Fletcher Class Destroyer. DD 445 Class.

35 

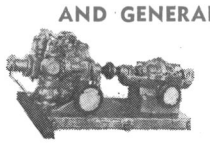
UNUSED SIZE 4 BUFFALO FEED PUMPS

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. DD 445 Class Fletcher.

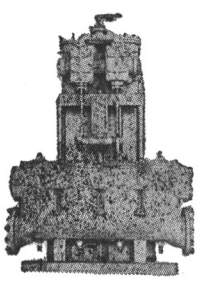
36 **FIRE & BUTTERWORTH PUMP**

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

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



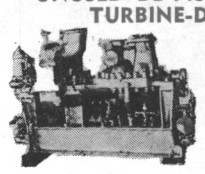
Allis-Chalmers 6x5 pump, type SKH—1200 GPM—125 PSI—3500 RPM. Coppos turbine type TF-22-2½ — 3500 RPM. 273#—50° superheat.

38 

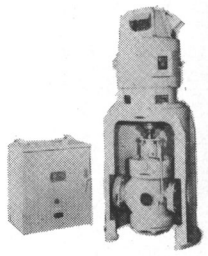
WORTHINGTON 16"x14"x18" VERTICAL DUPLEX STRIPPING PUMP

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 9'1½"—depth 3'9½"—wt. approx. 10,000 lbs.

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



Worthington — drawing SL-5043—425 GPM—1675' total dynamic head, 5000 RPM—3-stage — double suction. Flanged 4½" inlet—4" outlet. Powered by Sturtevant steam turbine—282 HP—590 PSI. For Fletcher DD-445 Class Destroyers.

40 

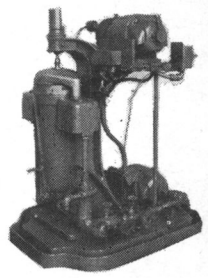
UNUSED DELAVAL IMO ROTARY PUMP

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

MISCELLANEOUS

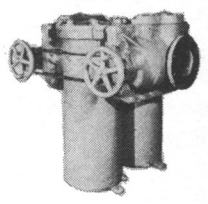
41 **ANCHOR WINDLASS**

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

42 

SHARPLESS LUBE & DIESEL OIL PURIFIERS

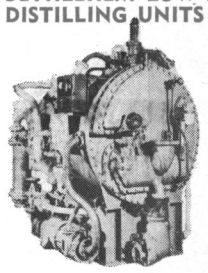
Type M-34-W22-UM—15,000 RPM. BOWL MOTOR: 2 HP—230 volts DC—8.5 amps—3450 RPM—250 to 300 GPH. Originally built for C-1-A diesel vessels.

43 

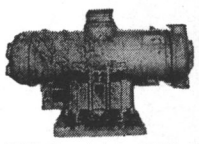
DUPLEX MAGNETIC OIL STRAINERS

4"—5"—6" sizes immediately available.

44 **BETHLEHEM LOW-PRESSURE SINGLE EFFECT DISTILLING UNITS WITH AUTOMATIC FEED WATER CONTROL**

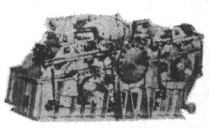


Model S-1-10E—10,000 gallons per day clean tube capacity. Tube nest steam pressure 5 PSI. With brine pump and distillate pump. Units have Weir automatic feedwater controls—salinity indicator, etc.

45 

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

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

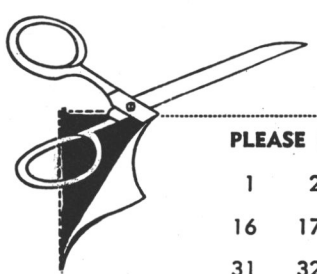
46 

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. Gear output 400 RPM. Suitable for Dredge Pumps.

INQUIRE FOR ALL OTHER ITEMS

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



PLEASE SEND INFORMATION ON THE FOLLOWING: (Please circle items) 5/15/73

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46														

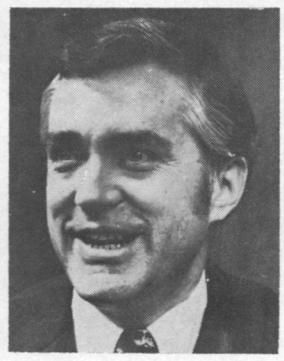
NAME..... COMPANY.....

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

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

Airmarc Corporation Appoints Sadin President, General Mgr. —Noble As Marketing Director

Stanley R. Sadin



C. Norman Noble

Airmarc Corporation, Bellevue, Wash., manufacturer of high-quality marine, land mobile and aircraft radiotelephone and communication equipment, has announced the appointment of **Stanley R. Sadin** as president and general manager. Also announced was the appointment of **C. Norman Noble** as marketing director.

Mr. **Sadin** brings to Airmarc a 25-year management background consisting principally of key executive positions at the Martin Marietta Corporation, and the General Electric Company.

He holds a master of science degree in engineering, and has served as director of research and all phases of product design, development and production direction.

Mr. **Sadin** stated: "Airmarc's reputation as a Northwest electronics manufacturer and supplier of high-quality electronics is becoming both nationally and internationally recognized. Airmarc's communication equipment is in operation throughout the world . . . not just on the air waves, but on vessels, vehicles, and aircraft of many flags."

Mr. **Noble** will direct the international marketing activities of the company's products throughout the world.

Mr. **Noble** was previously marketing director for Western Marine Electronics of Seattle. He is nationally recognized as an author of numerous articles on marketing, and has been active as a lecturer at American Management Association seminars throughout the United States.

Whittaker Division Receives Largest Shrimp Trawler Order

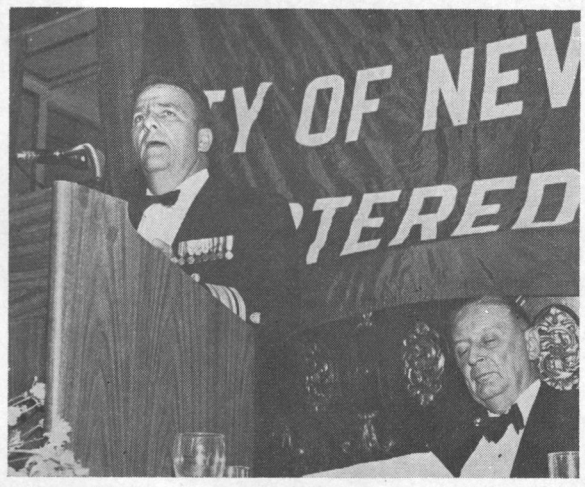
Frank C. Callahan, executive in charge of Whittaker Corporation's Marine Group of companies, has announced that its Desco Marine Division, St. Augustine, Fla., has received the largest single order for new shrimp trawlers in the history of the industry. The order, which exceeds $4 million, is for a fleet of 27 fiberglass and fiberglass/wood trawlers ranging from 68 feet to 75 feet in length.

According to division president **Richard H. Bennett,** the 27 trawlers are being built for the Government of Barbados, West Indies, and International Sea Foods Limited, which will operate the fleet out of Bridgetown, Barbados. Financing was arranged by the First National City Bank of New York through its offices in Barbados.

With five domestic divisions and one foreign subsidiary involved in marine construction, Whittaker's Marine Group ranks as the world's largest builder of pleasure yachts, as well as shrimp trawlers. Whittaker Corporation's activities are centered in products and services for the transportation, recreation, metals, textiles and chemicals markets.

Listed on the New York Stock Exchange, Whittaker reported sales of $576 million for its fiscal year ended October 31, 1972.

RAdm. Benkert, USCG, Speaks At 203rd Annual Dinner Of Marine Society, City of N.Y.



RAdm. **William M. Benkert,** USCG, pictured at the podium during the dinner, is shown with Capt. **Wilbur E. Dow Jr.,** president, Marine Society of the City of New York.

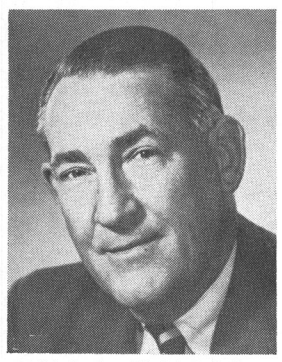
The Marine Society of the City of New York held their 203rd Annual Dinner on April 16, 1973 at the Plaza Hotel.

Guest speaker was RAdm. **William M. Benkert,** USCG, Chief—Office of Marine Environment and Systems, who spoke on the Ports and Waterways Safety Act of 1972 and the impact of LNG ships on environmental conditions in U.S. waters.

He also spoke on the need for new traffic systems in U.S. ports and said that the Coast Guard is currently undertaking a survey and research program to determine the need of each port for a traffic system.

Matson Names Pfeiffer President —Blaisdell Becomes Senior VP Of Alexander & Baldwin, Inc.

Robert J. Pfeiffer



Malcolm H. Blaisdell

Robert J. Pfeiffer has been named president of Matson Navigation Company to succeed **Malcolm H. Blaisdell,** who has been named senior vice president of Alexander & Baldwin, Inc. of Honolulu, Matson's parent company.

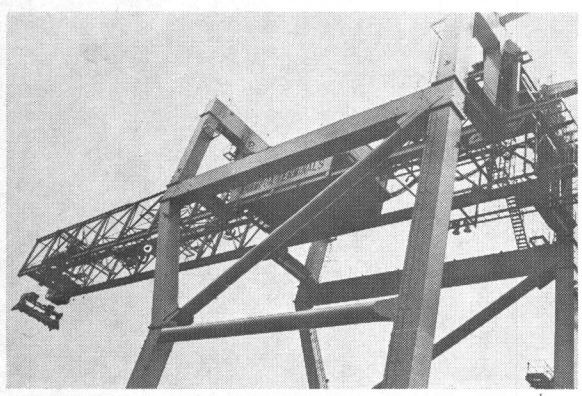
The announcement was made by **Lawrence S. Pricher,** A&B president and Matson's board chairman. Mr. **Pricher** also announced that **Edward B. Holroyde** and **Michael Ulyshen** have been named senior vice presidents of A&B. Mr. **Ulyshen** is president of Lewers & Cooke, Inc. He joined Alexander & Baldwin on May 1.

In his new post, Mr. **Blaisdell** will be responsible for development programs, long-range planning and top-level liaison between A&B's mainland and Hawaii activities. He joined A&B in 1964, and has served as Matson's president since 1970.

Mr. **Pfeiffer,** a veteran of 36 years in the steamship industry, joined Matson in 1960. He has served as executive vice president since April 1971. He was president of Matson Terminals, Inc., a Matson subsidiary, from 1962 until 1970, when he became board chairman. Before that, he served four years as vice president for Matson's Far East freight service.

Before joining Matson, Mr. **Pfeiffer** was with Pacific Far East Line as manager of the terminal and cargo operations division. He began his career in Honolulu with the Inter-Island Steam Navigation Co., Ltd., and was a Navy officer in World War II.

Mr. **Pfeiffer** is a life member of the National Defense Transportation Association, and past president of the United States National Committee of the International Cargo Handling Coordination Association, Inc. and the National Association of Stevedores. He is past president of The Propeller Club of Honolulu.



WORLD'S LARGEST PORTAINER CRANE: Whampoa Terminals Limited, Hong Kong, have recently brought their new Paceco crane into operation following satisfactory trials by Mitsui engineers. This unique crane, which is now a conspicuous landmark in Hunghom, was specially constructed to conform with airport height restrictions, which explains its low-profile design. The main boom weighs over 300 tons, and was lifted into position in one piece. The crane has an outreach of 144 feet, which is understood to be the longest in the world, and it handles, on average, 25 containers an hour. Whampoa Terminals services Orient Overseas Container Lines, American Mail Line, and American President Lines.

SNAME New York Section Hears Paper By Two Authors On Offshore Nuclear Power Plants

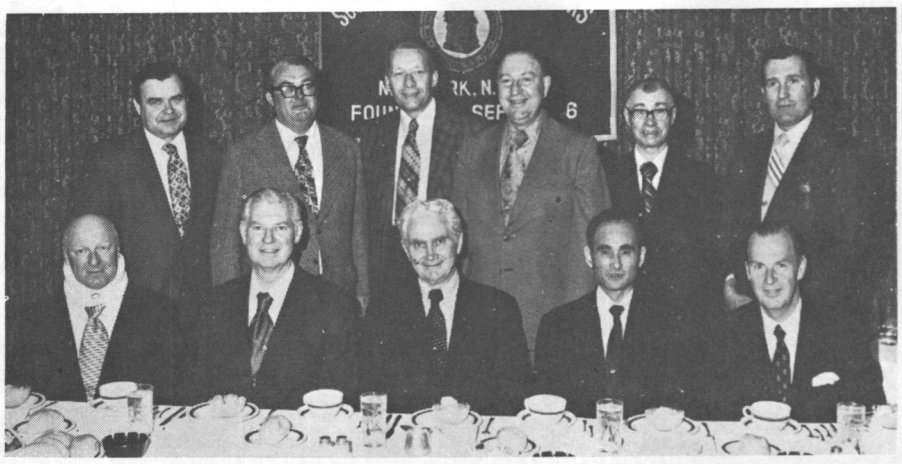
The New York Metropolitan Section of The Society of Naval Architects and Marine Engineers met on April 12 at the Stevens Institute of Technology, Hoboken, N.J.

At the technical session, which was preceded by a social hour and dinner, a paper was presented titled "Offshore Nuclear Power Plants," by **M. Kehnemuyi** (Public Service Electric & Gas Co.), and **R.E. Lochbaum** (Offshore Power Systems).

This paper describes the floating nuclear power plant concept with specific reference to the Atlantic No. 1 and No. 2 units being manufactured for Public Service Electric and Gas Co. by Offshore Power Systems. Site description and selection criteria, the shore support facilities, the breakwater required to protect the plants, the floating nuclear power plants, the manufacturing facility for the plants, and supporting studies being conducted are discussed.

The New England Section of SNAME has extended an invitation to the members of the Metropolitan Section to attend their May 26 meeting, which will be held at Blount Shipyard near Newport, R.I. Mr. **Blount** plans to provide members with a tour of his facilities and a cruise of Narragansett Bay on one of his new excursion steamers. During the cruise, a buffet dinner will be served for a nominal charge. Anyone interested in attending this meeting may reserve a place for himself and guests by contacting **K. Keays** at the Massachusetts Institute of Technology, Room 5-228A, Cambridge, Mass. 02139.

N.Y. Port Engineers Hear Speakers Discuss 'Worldwide Shipyard Estimating Practices'



Pictured at the meeting, (seated) left to right: **Philip A. Donahue,** president of the Society; **Lewis S. Summers, Robert G. Keane, Kazuhiko Watanabe,** and **Nils Eckerbom,** speakers; (standing) left to right: **John Antonetz,** chairman of the papers and technical committee; **Edward English,** chairman of the program and entertainment committee; **William P. Towner,** second vice president of the Society; **Joseph Thelgie,** first vice president of the Society; **Harry H. Hunt,** secretary-treasurer of the Society, and **Thomas Jones Jr.,** chaplain.

The Society of Marine Port Engineers New York, N.Y., Inc. met on April 18 at the Downtown Athletic Club in New York City.

At the technical session, which was preceded by a dinner, the subject "Worldwide Shipyard Estimating Practices" was discussed. The speakers were **Kazuhiko Watanabe,** Yokohama Shipyard and Engine Works, Mitsubishi Heavy Industries, Ltd., Japan; **Lewis S. Summers,** chief estimator, Bethlehem Steel Corporation, San Francisco Yard, and **Robert G. Keane,** assistant chief estimator, Bethlehem Steel Corporation, Baltimore Yard.

Nils Eckerbom, vice managing director, Lisnave Shipyard, Lisbon, Portugal, had some brief comments regarding estimating prior to the question and answer session. Sponsors were **Philip A. Donahue,** assistant vice president, Maritime Overseas Corp., and **Joseph Thelgie,** superintendent engineer, Marine Transport Lines, Inc.

Mr. **Watanabe's** paper is prepared for dealing with the general idea of the estimation practice of ship repairing and conversion costs. Estimation is usually made in accordance with the composition of net production cost. The composition of net production cost may differ according to the way of accounting and assortment of various expense arising in the production process.

Mr. **Watanabe** maintains that this way of assortment is variable according to the commercial law and tax law which regulates corporations of each country, or to the differences in practices of the cost accounting system of each company, in the process of appropriation for cost of various expenses. Accordingly, the unit which is provided for estimation and based on the assortment items of net production cost may differ in each company or shipyard, and consequently the estimation practice may differ.

Mr. **Summers's** paper presents the function, operating methods, a few problems, and suggested solutions for the estimator of a shipbuilding or ship repairing firm. Specifications and their effect on estimating are discussed. The advantages to operator and yard alike that may be obtained by using clear, simple and unambiguous specifications are mentioned. The possibilities of standardized nomenclature to assist in achieving these advantages are also reviewed.

In his paper, Mr. **Keane** contends that when a customer commits his ship to a shipyard for conversion or overhaul, it becomes the ship repair yard's objective to prepare the most accurate estimate of cost and time, which will mean a minimum expenditure of money and loss of time for the ship's owner. With this purpose in mind, this paper presents some of the estimating practices of a ship repair yard.

Mr. **Keane** concluded that good estimating practices are an essential part of the ship repair operations and initiates the first step in obtaining business. Therefore, one of the top priorities of a ship repair yard is to have a highly proficient staffed estimating department.

R.J. Randolph Named Manager Of TTT'S Savannah Office

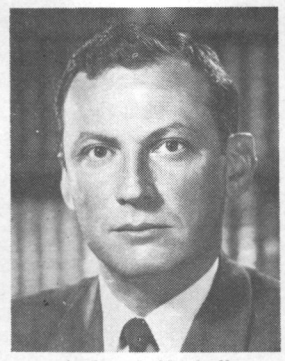
Texas Transport & Terminal Co., Inc., ship agents and stevedores, announced that **Robert J. Randolph** has been appointed manager of its Savannah, Ga., office, succeeding the late **Harry G. Luby.**

Mr. **Randolph** joined TTT in August 1965, and was assigned to the European Division. He subsequently served as assistant line manager of C.N. Lloyd Brasileiro, the Venezuelan Line, Cunard-Brocklebank, and manager of the Yamashita Shinnihon Line in New Orleans, La., before his promotion to assistant manager of the Savannah office when it opened in January 1970.

Before joining TTT, Mr. **Randolph** was associated in various capacities with the Waterman Steamship Company.

Matson Navigation Names Three Senior VPs

Gordon E. Bart



Arthur J. Haskell

James P. Gray

Matson Navigation Company has promoted vice presidents **Gordon E. Bart** and **Arthur J. Haskell** to senior vice presidents, it was announced by **R.J. Pfeiffer,** president.

James P. Gray has been appointed a senior vice president of Matson, in addition to his position as president of Matson Terminals, Inc.

Mr. **Bart,** who has been vice president of sales since last July, will also be responsible for operations and contracts and agency affairs. Mr. **Haskell,** who has been vice president of engineering and marine operations since December 1970, will also be responsible for industrial engineering and purchasing.

Mr. **Bart** began his maritime career in the Far East after World War II Army service and joined Matson in 1959 as a project engineer in San Francisco. Mr. **Haskell,** a graduate of the United States Naval Academy and Massachusetts Institute of Technology, started with Matson in 1964. Mr. **Gray** started with Matson in 1936 in Los Angeles, and became president of Matson Terminals in April 1971.

SES Specialist Joins Aerojet-General Div.

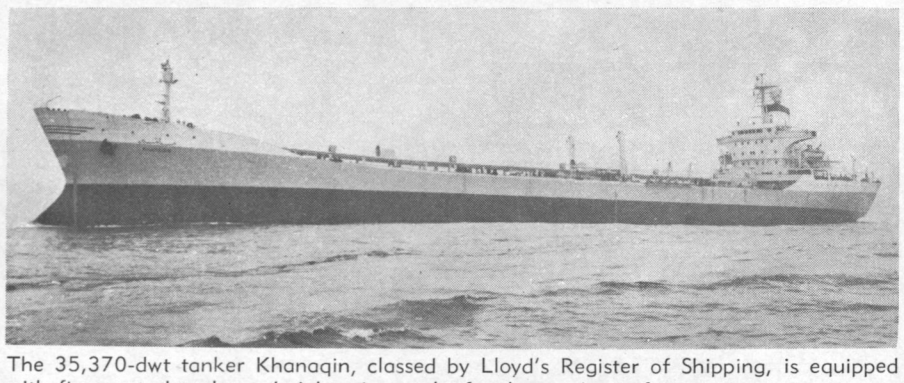
Peter J. Mantle, an expert in air-cushion vehicle design and production with 13 years of experience in the field, has joined Aerojet Surface Effect Ships Division, Tacoma, Wash., as director of engineering.

The SES Division designs, develops, and builds advanced seagoing and amphibious naval vessels for travel on a cushion of air at far higher speeds than ships of conventional design can attain.

Mr. **Mantle** was previously Bell Aerospace Co. project manager for development of a U.S. Navy 100-ton surface effect test craft at New Orleans, La., and was responsible for the design of the craft. Earlier, he held engineering posts on surface effect craft projects with General Dynamics' Electric Boat Division at Groton, Conn., and Vehicle Research Corp., Pasadena, Calif.

A native of England, Mr. **Mantle** attended Cranfield College of Aeronautics there, and later received a master's degree (cum laude) in aeronautics and mathematics from Laval University in Quebec. He also holds an advanced degree in aerodynamics from California Institute of Technology.

Astilleros Espanoles Completes Tanker For Iraq



The 35,370-dwt tanker Khanaqin, classed by Lloyd's Register of Shipping, is equipped with five central tanks and eight wing tanks for the carriage of cargo.

The official sea trials of the 35,370-dwt tanker Khanaqin have been successfully completed at the Sestao Yard of Astilleros Espanoles, S.A.

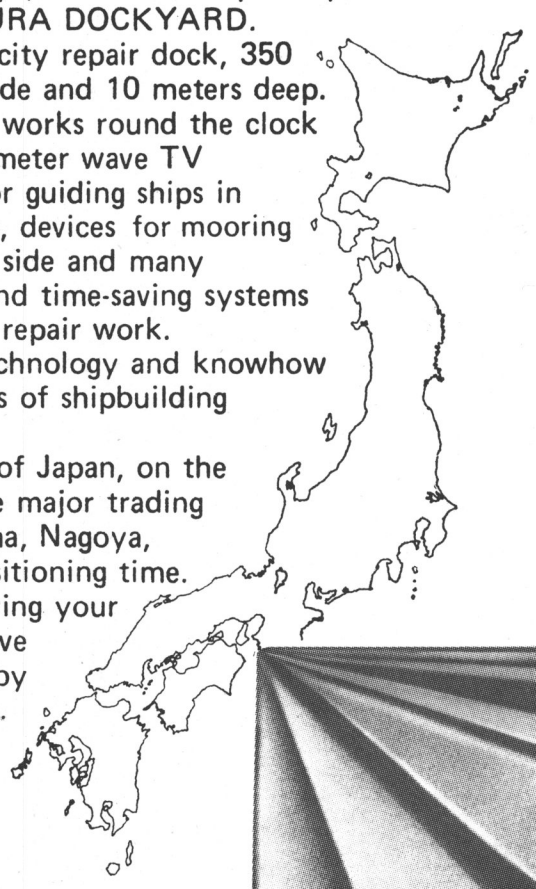
Built for Iraqi Maritime Transport Co., Iraq, the approximate measurements and main particulars of the new tanker are as follows: length overall, 659 feet; molded breadth, 87 feet; depth to upper deck, 46 feet, and maximum draft, 35 feet. The vessel has a cargo tank capacity of 41,068 cubic meters and is classed by Lloyd's Register of Shipping.

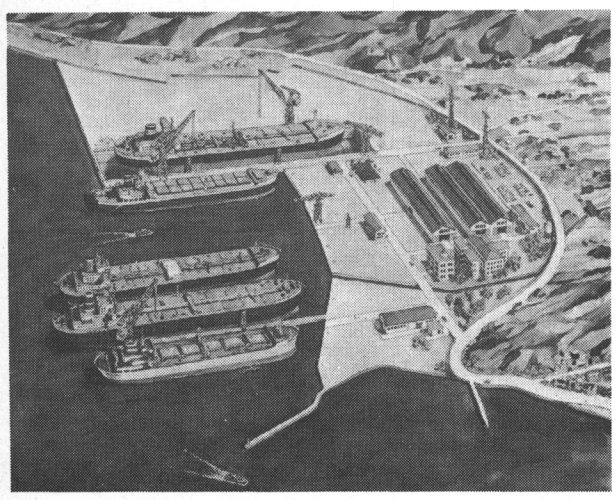
The propulsion machinery comprises a 6RD90 AESA-Sulzer engine totaling 13,800 bhp at 119 rpm and a speed of 16 knots.

The Khanaqin is a very stylized vessel with a forecastle and the superstructure for crew's accommodation arranged abaft. All cabins, salons, messrooms and dayrooms have been equipped with air-conditioning systems.

330,000-ton repair dock at YURA

To meet the increasing demand for repair yards capable of handling large-sized ships, MITSUI has specially designed and built the YURA DOCKYARD.
It has a 330,000-ton capacity repair dock, 350 meters long, 65 meters wide and 10 meters deep.
The new dockyard which works round the clock is equiped with the milli meter wave TV and laser beam systems for guiding ships in and out at night or in fog, devices for mooring trials at wet berth or pier side and many other latest labor-saving and time-saving systems and facilities for efficient repair work.
Besides it is backed by technology and knowhow accumulated over 50 years of shipbuilding and repairing.
Its location in the center of Japan, on the main route connecting the major trading ports of Tokyo, Yokohama, Nagoya, Osaka and Kobe saves positioning time.
If you are thinking of having your ships repaired, you will save a lot of time and money by calling us for more details.





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ASNE Meets At SUNY Maritime College —Officers Elected

On March 29, 1973, the Metropolitan Section of the American Society of Naval Engineers held its first quarterly meeting at the Maritime College of the State University of New York at Fort Schuyler.

The meeting's professional topic was "Prevention of Catastrophic Failure of Reciprocating Engines." **Robert Pennell,** executive vice president of Beta Engine Systems Corporation, Dallas, Texas, spoke about equipment developed by his company, and marketed for predictive maintenance use in the marine diesel industry. **Michael Cunningham,** Naval Ship Engineering Center, Philadelphia Division, followed with comments relating to testing of the equipment and other devices by the U.S. Navy.

In recent years, the forecasting of marine diesel performance has become increasingly significant from a management viewpoint. Analyzers have been used to great advantage by the gas compressor industry, and are just now showing up on the marine scene.

Beta Engine Systems have developed an electronic process whereby engine analysis can be taken either on a continuous basis or on a scheduled basis to determine engine wear before catastrophic failure occurs.

Mr. **Cunningham** was able to set up a Beta B-300 analyzer on a Caterpillar 100-hp D-320 engine for a very excellent demonstration of the capabilities of the equipment. The 35 members present were treated to a first-hand look at the operation of an analyzer. Mr. **Cunningham** stated that the U.S. Navy has been working for years investigating diesel engine failures through the use of analyzers.

This meeting also included the election of officers. Capt. **E. Barker,** USN (last year's chairman), has been appointed a lifetime member of the executive committee, which is an honor accorded all past chairmen. The new chairman is Lt. Comdr. **George Ireland,** USCG, Supervisory-Boiler Inspection, Merchant Marine Inspection-New York, Third Coast Guard District. New vice chairman is **Robert Sleirtin** of the Raytheon Company Maritime Systems Center in Portsmouth, R.I. Mr. **Sleirtin** is the new manager of marine project development. Also elected to a three-year term as counselor was Capt. **Stanley Waitzfelder,** USCG, Officer in Charge, Merchant Marine Inspection-New York, Third Coast Guard District.

The next meeting for the ASNE Metropolitan Section will be held in June of this year.

Kerr Steamship Appoints J.D. Read

Kerr Steamship Co. Ltd., Vancouver, British Columbia, has announced the appointment of **J. David Read** as district manager.

Mr. **Read** succeeds **G. Philip Nutt,** who has been named general manager in charge of the company's Mexican and Central American operations, based with Agencies Maritimas Kerr, Mexico City. Mr. **Read** has been with Kerr for the past three years.

Det norske Veritas Revised Rules For Mobile Offshore Units

Det norske Veritas, P.O. Box 6060, Etterstad, Oslo 6, Norway, has published new "Rules for Construction and Classification of Mobile Offshore Units 1973" in English. The Rules have been developed from the preliminary "Principles for Classification of Offshore Drilling Platforms," published in 1970. These principles gave in concentrated form general requirements to materials, structural strength and stability of the platform.

The experience gained from classification of offshore units since 1970 has revealed the need for more detailed rules and an extension of the classification concept. Thus, the new Rules for mobile units comprise regulations for materials, structural strength, stability and watertight subdivision, emergency mooring equipment, jacking system, propulsion machinery with shafting and propellers, steering gear and rudders, auxiliary machinery, piping system and electrical plant.

Probable environmental loads are to be evaluated by statistics for the most exposed operation areas, and the highest expected loads in the course of 100 years are to be applied as design loads. Methods are given for calculation of forces from wind, waves and current. Maximum values to be expected for certain ocean areas are given.

Allowable material stresses are as found safe for units which have been operating in exposed ocean areas, for example the North Sea.

The new Rules are the result of close cooperation between Det norske Veritas's experts and a number of builders and operators of offshore units represented in the Society's Advisory Committee on Offshore Technology.

The Rules cover all forms of mobile offshore structures.

Buhrmann Named Operations Manager U.S. Steel Lakers

William B. Buhrmann has been named manager of operations for U.S. Steel's Great Lakes Fleet, Duluth, Minn., according to an announcement by **W.R. Ransom,** general manager. In this capacity, Mr. **Buhrmann** will be responsible for the operation of the Fleet's 35 ore carriers and their personnel.

In addition to the ore fleet, Mr. **Buhrmann** will supervise operations of eight self-unloading vessels that haul limestone products from U.S. Steel's Michigan quarries to a variety of users on the Great Lakes.

A native Pittsburgher, Mr. **Buhrmann** was graduated from the University of Pittsburgh with a degree in mechanical engineering, and in 1971 he attended Cornell University's Executive Development Program.

After receiving his degree from the University of Pittsburgh, Mr. **Buhrmann** joined U.S. Steel as a trainee at Homestead Steel Works, near Pittsburgh, Pa. In 1955, he got his first management job when he became a foreman in Homestead's structural mill. Two years later, he was named that mill's general foreman-operations.

After holding several general foreman posts in the structural mills, he became superintendent of the plant's wheel and axle division in 1964. Four years later, he returned to the main Homestead plant as assistant division superintendent, slab and plate, and in 1970 was named division superintendent in charge of that unit. In July 1972, he was promoted to assistant to the general superintendent of Homestead Steel Works.

Mr. **Buhrmann's** experience in U.S. Steel's integrated operations will be utilized in coordinating the annual vessel movement of 20-million tons of Minnesota Taconite pellets and iron ore products, and more than 10-million tons of limestone products to lower lake ports.

RPC Division Midland-Ross Expands Facilities

The RPC Division of Midland-Ross Corporation has completed a 25-percent expansion of its manufacturing facilities at Roxboro, N.C.

The additional space will be used primarily for production of Tami-Lift mobile straddle cranes for marine, industrial and transportation applications, according to **J.E. Fathauer,** general manager of the division. He said sales of the cranes this year are expected to increase about 45 percent over 1972.

Mr. **Fathauer** said the expansion will also enable RPC to boost production of container - handling equipment.

IEEE Announces OCEAN 73 Conference Sept. 25-28 In Seattle

OCEAN 73, the fourth annual IEEE International Conference on Engineering in the Ocean Environment, will provide a major forum for papers on electrical and electronic technology applied to ocean and marine systems.

More than 100 papers on subjects ranging from underwater acoustics to polar research will attract marine engineers and managers worldwide to the conference to be held at the Washington Plaza Hotel in Seattle, September 25-28.

Sponsored by the Seattle section of The Institute of Electrical and Electronics Engineers and the IEEE Oceanography Coordinating Committee (OCC), OCEAN 73 will demonstrate the deep involvement of electrical and electronic technology in virtually all ocean and marine activities, and therefore the program will feature papers on environmental measurement, prediction and control, transportation, underseas mining, naval systems, and offshore power plants.

"Approximately 500 participants are expected at OCEAN 73," predicts Dr. **Theodor F. Hueter** of Honeywell's Marine Systems Division Seattle Center, "and on the basis of papers accepted to date by the technical program committee, participants can look forward to 15 outstanding sessions."

Dr. **Hueter** and **Edward W. Early** of the Applied Physics Laboratory at the University of Washington are co-chairmen of the conference steering committee.

Technical program chairman **Gil Raudsep,** also of Honeywell, reveals that in addition to many U.S. submissions, papers are being received from Japan and Canada, and that others from Europe, the USSR, and Australia are anticipated. The majority of the U.S. contributions are from industrial firms and from naval research groups within the Department of Defense; however, a significant number have been received from universities and nonprofit research organizations.

To coordinate the varied ocean-related activities of its members, IEEE founded its Oceanography Coordinating Committee in March 1968. Beginning in 1970, OCC, in conjunction with local IEEE sections, has sponsored annually a technical conference on engineering in the ocean environment. Previous conferences have been held in Panama City, San Diego, and Newport, R.I. The 1974 conference is slated for Halifax, Nova Scotia.

On the opening day of the conference, a plenary session in the morning will be followed by a luncheon and three concurrent technical sessions in the afternoon. An evening reception is planned for the Washington Plaza's Westlake Room.

Wednesday's schedule includes three sessions both in the morning and afternoon, and features an evening boat cruise on Puget Sound to Blake Island for an Indian-style salmon bake.

Thursday's schedule is identical to Wednesday's except that there will be a conference luncheon, and the evening features a program of films on polar seas research in the Eames Theatre at the Pacific Science Center.

The final day, Friday, is devoted to technical tours. One tour will be devoted to visits to various oceanographic facilities in the Seattle region. Another is planned for oceanographic installations west of Puget Sound, notably the Naval Torpedo Station, Keyport, and the ranges at Dabob Bay.

Organizations supporting OCEAN 73 include the Acoustical Society of America, Northwest Chapter; The Boeing Company; Honeywell Marine Systems Division Seattle Center; Harry Levinson Company; Jon B. Jolly, Inc., and the Marine Technology Society, Puget Sound Section.

Others are the Municipality of Metropolitan Seattle, Naval Torpedo Station, Keyport; Oceanographic Commission of Washington; Pacific Oceanographic Laboratories; Sparling & Associates; Oceanic Associates, Inc.; the University of Washington, and Washington Sea Grant.

SNAME Philadelphia Section Holds Joint Meeting With ASNE

Shown at the joint meeting, left to right: **J.M. Ballinger,** discusser; **W.G. Neal Jr.,** chairman, SNAME Philadelphia Section; **E.D. Schaefer** and **D.C. Garber,** authors; **M.A. Morris** and **A.C. Brown,** executive committee, Philadelphia Section; **Hector T. McVey,** secretary-treasurer, and **T.J. Kavanagh,** vice chairman.

The Philadelphia Section of The Society of Naval Architects and Marine Engineers held a joint meeting with the members of the American Society of Naval Engineers on April 13 at the Engineers Club of Philadelphia. Approximately 65 members and guests attended the meeting, which was preceded by cocktails and dinner.

ASNE member **Daniel C. Garber** of Sun Shipbuilding and Dry Dock Co. presented a paper covering an oily water separator system for shipboard use.

The oily water separator (patent applied for) system is designed to process any oil-water mixture regardless of quality or quantity of oil content. Various components comprising the system act essentially to effect the complete separation of oil and water, using only physical processes and without any recourse to heat or chemicals. The system yields clean water having less than 10 PPM oil content.

A pilot plant has been installed on board the 80,000-ton tanker S/S America Sun. The system has operated successfully on three ballast trips between Marcus Hook, Pa., and Port Arthur, Texas.

R. McFadden, chief of the machinery department at the J.J. Henry Co., Inc., Moorestown, N.J., office, discussed the paper presented by Mr. **Garber.**

The subject of the evening's second paper was "Application of Finite Element Analysis to Marine Design," which was presented by SNAME member **Edward D. Schaefer** of the J.J. Henry Co., Moorestown.

Mr. **Schaefer** described the use of matrix techniques based on finite element representation and its application in the design and analysis of ship structures.

The finite element analysis method can provide an economical, rapid and reliable means of predicting the stresses and deflections of various types and sizes of ships.

The matrix method provides a greater knowledge of how the ship structure behaves; provides an accurate picture of displacement and stresses for each element in the structure; when used in conjunction with a digital computer, can rapidly verify the overall length of the ship structure, and reduces overall vessel construction costs and provides a means for insuring greater safety and reliability in the design of all types of ship structures.

J.M. Ballinger, manager of research and development at Sun Shipbuilding and Dry Dock Co., discussed the paper presented by Mr. **Schaefer.**

The meeting was coordinated by **A.C. Brown,** general manager of the J.J. Henry office at Moorestown.

Both authors were presented with a certificate of appreciation by **Walter G. Neal Jr.,** chairman of the Philadelphia Section.

GE Names Bonner To Head Marine And Industrial Dept.

Orville R. (Bud) Bonner has been named general manager of GE's Marine and Industrial Department, according to an announcement by **Gerhard Neumann**, vice president and group executive of the Aircraft Engine Group. Mr. **Bonner's** headquarters will be in Evendale, Ohio.

Mr. **Bonner** succeeds **Samuel J. Levine,** who has been appointed manager of operational effectiveness for the Aircraft Engine Group, reporting to Mr. **Neumann.**

In his new position, Mr. **Bonner** will be responsible for all design development, marketing, production and customer service for marine and industrial applications of GE-built aircraft gas turbines. He has 20 years' association with the aircraft engine business. His last position was general manager of the Aviation Service Department.

A Tom Swift Adventure

The train shuddered to a halt. Tom Swift and his friend, Ned Newton stared at the lightning-shattered tree trunks.

"This is the worst weather I've ever seen." said Tom stormily. "We must clear the tracks."

He glanced at the men climbing off the cars. "Some of the boys may be hurt." he winced. "Good thing we have Midland's Workmen's Compensation coverage," he observed protectively.

"First thing we got after we started this Short Line," replied Ned. "Midland did such a great job for our trucking, maritime and fast-food operations," agreed Tom comprehensively. "It figures they would know all the angles here too," he concluded acutely. "They even took care of our Property coverage," he went on expansively. "But let's clear the tracks. The weather is acting up," he said dramatically.

"Those trees weren't so heavy," said Tom lightly once the job was done. "Now we must tally up the damage," he said appraisingly, "and get in touch with Midland right away."

"Don't tell me they have squads of reps out here?" asked Ned rightly. "No. There's no safety in misplaced numbers," replied Tom tellingly. "What we need is help from very few, very expert generals. Not a legion of spear carriers like the other companies have," he said pointedly.

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Here are the rules:
The Swiftie must concern itself with some aspect of insurance.

It should be on your company letterhead. It can be as long or short as you want.

Every Quarter we will pick five winners. They will get Tom's latest mystery invention. It will be a surprise you'll love and cherish.

All entrants, winners or not, will get a free Tom Swift poster in testimony to the ideals of our hero and his inventive genius . . . and yours, too.

Even if you don't win Tom's latest invention, you'll hear from us consolingly.

McFall Named VP And General Manager Foss Alaska Line

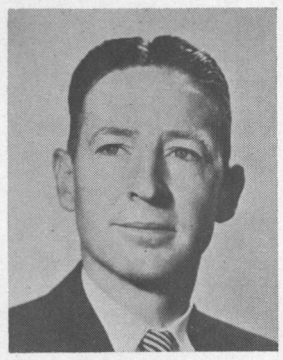
Roy D. Jurgensen, president of Foss Launch & Tug Co., has announced the appointment of **Fred J. McFall** as vice president and general manager of Foss Alaska Line.

Mr. **McFall** has been active in the transportation field for the past 13 years, including posts with Garrett Freight Lines, and Consolidated Freightways Inc. Prior to joining Foss, he was division manager for Consolidated Freightways in Ohio, Pennsylvania, and West Virginia. He was previously division manager for Consolidated's Washington, Oregon, Idaho, and Montana freight activities, with headquarters in Portland.

Born and raised in Salt Lake City, Utah, Mr. **McFall** holds a B.S. degree in transportation from the University of Utah, and has completed graduate school work at that institution, as well as Gonzaga University.

Foss Alaska Line is a division of Foss Launch & Tug Co., Seattle, Wash., which inaugurated the weekly freight service in 1970, providing scheduled container and general freight sailings, including refrigerated vans, to primary ports in southwestern Alaska. Foss Alaska Line also provides seasonal freight service to southwestern Alaska and the Bering Sea. This year, the operation was moved to a new $2,300,000 terminal covering 10 acres on Seattle's Duwamish Waterway.

National Cargo Bureau Hold Elections— Board Members Named



Robert A. Murphy

The 22nd Annual Meetings of Members and Directors of National Cargo Bureau, Inc., were held on April 16, 1973 at 99 John Street, New York City.

Robert A. Murphy, director, Chubb & Son Inc., was reelected chairman of the board of directors; **T.J. Smith,** president of Farrell Lines Incorporated, was reelected deputy chairman of the board, and **J.R. Walbridge,** manager marine-aviation department, Insurance Company of North America, was reelected treasurer. Capt. **Hewlett R. Bishop,** president, Capt. **S.M. Sammis,** vice president and chief surveyor, and **Jerome P. Scully,** secretary, continue to serve in their respective positions.

The members elected the following to the board of directors: Adm. **C.R. Bender,** Commandant, United States Coast Guard; **R.W. Berry,** consultant; **R.M. Buckley,** partner, Simpson, Spence & Young; **M.G. Bulloch Jr.,** vice president-operations, Lykes Bros. Steamship Co., Inc.; **K.J. Creber,** president, Wm. H. McGee & Co., Inc.; **R.W. Hahn,** vice president, Great American Insurance Co.; **D.E. Taylor,** executive vice president, Atlantic Mutual Insurance Company, and **R.J. Weigele,** vice president, terminal operations, United States Lines, Inc.

$3.5-Million Contract To Boeing Aerospace For Hydrofoil Vessel

Far East Hydrofoil Company, Ltd., Hong Kong, which maintains one of the world's largest foilborne fleets, has placed an order for a second commuter-tourist hydrofoil vessel for its Hong Kong-Macao fleet.

Boeing Aerospace Company, Seattle, Wash., will build the 106-ton Jetfoil, which will be delivered in the fall of 1974 under a contract valued in excess of $3.5 million.

The vessel is designed to cruise through 12-foot-high waves at speeds of more than 45 knots.

Pacific Far East Line Names H.B. Luckett

H. Boyce Luckett

H. Boyce Luckett has been appointed vice president-traffic of Pacific Far East Line, Inc., San Francisco, Calif., it was announced by **Leo C. Ross**, president.

Mr. **Luckett** will be responsible for all traffic functions of the company, including continuation of those relating to the passenger liners S/S Mariposa and S/S Monterey. He replaces **E.A. Wester,** who has resigned for personal reasons.

Bertram Yacht Names New Materials Manager

Gordon L. Smith

Robert W. Barker, vice president of administration for Bertram Yacht, Miami, Fla.-based division of Whittaker Corporation's marine group, has announced the appointment of **Gordon L. Smith** as materials manager.

Mr. **Barker** said Mr. **Smith** comes to Bertram Yacht from Howard Industries of Racine, Wis., where he was corporate materials manager. He has also previously served as purchasing and production control manager of Raytheon Marine Products, San Francisco, Calif.

"Mr. **Smith** has a strong background in purchasing, warehousing and production control activities," Mr. **Barker** said. "I am certain his experience will prove to be a valuable asset to Bertram's industry-leading operation."

In his new position with Bertram Yacht, Mr. **Smith** will be responsible for all areas of multiplant materials management, including inventory control, plant and divisional purchasing, stocking, warehousing, small parts, shipping and receiving.

Mr. **Smith** is a graduate of George Washington University, San Francisco City College, and Healds College, San Francisco. He was honorably discharged from the United States Navy in 1957 after a four-year enlistment.

Nat'l Marine Service Names Chester Walters Engineering Director

The appointment of **Chester H. Walters** as director of engineering for National Marine Service, Inc,. St. Louis, Mo., has been announced by **David A. Wright,** president. His primary responsibilities will include establishing engineering standards for use in design, production and operations by all divisions, and quality control and other procedures with which to apply these standards.

Additional responsibilities will include planning and estimating of plant and fleet capital and repair programs, letting of construction contracts, and an overview of performance of such projects after their completion. Mr. **Walters** will have headquarters in the company's main office, and will report directly to **Don Bidgood,** executive vice president.

Mr. **Walters** received a mechanical engineering degree from the University of Kentucky in 1955. He joined Ashland Oil immediately after graduation and served in engineering capacities in the marine department until January 1970, when he was named vice president, operations of Thomas Petroleum Transit, a division of Ashland. He joined National Marine early in 1972.

Chesapeake Section Meets And Hears Two Papers At Naval Ship Research And Development Center

Principals of the Chesapeake Section meeting shown above at the Naval Ship Research and Development Center, left to right: **R.J. Boswell,** NSRDC, author; **G.G. Cox,** NSRDC, author; **Phillip Eisenberg,** national president, SNAME; **Seth Hawkins,** vice chairman, Chesapeake Section; **R. Wermter,** NSRDC, technical session moderator; Capt. **P.W. Nelson,** Commander, NSRDC; **C. M. Lee,** NSRDC, author, and **R. M. Curphey,** NSRDC, author.

The Chesapeake Section of The Society of Naval Architects and Marine Engineers held the sixth meeting of its 1972-73 technical program on March 14, 1973, at the Naval Ship Research and Development Center in Carderock, Md.

The meeting began with a demonstration of a SWATH ship in waves in the Maneuvering and Seakeeping Basin at the Naval Ship Research and Development Center. The group was also given a tour of the David Taylor Model Basin, which is over 3,000 feet long and one of the finest examples of a hydrodynamic towing tank in the world. The model basin has two parallel tanks, the first being a deepwater tank which is 22 feet deep and 51 feet wide, and the second being a high-speed facility capable of testing advanced ship concepts requiring high speeds in excess of 40 knots. This tour was followed by the social hour and dinner, which were enjoyed by approximately 190 members and guests.

Vice chairman **Seth Hawkins** opened the meeting by welcoming those in attendance and introducing distinguished visitors, including **Phillip Eisenberg,** national president of SNAME, **Charles Zeien,** executive vice president of J.J. Henry Co., Inc., and Capt. **P.W. Nelson,** Commander, NSRDC.

After completing other normal Section business and after a few welcoming remarks by Captain **Nelson,** vice chairman **Hawkins** introduced **R. Wermter,** Chief, Ship Powering Division, NSRDC, the moderator of the technical session. Mr. **Wermter** stated that there would be two papers and introduced the five authors, representatives of the Ship Performance Department, Naval Ship Research and Development Center, as being among the foremost authorities in their fields.

The authors of the first paper were **C.M. Lee, R.M. Curphey,** and **H.D. Jones** (Mr. **Jones** was not able to attend the meeting), and the title of their paper was "Prediction of Motion and Hydrodynamic Loads of Catamarans." The authors summarized the reason for their work as follows: "A large useful area is one of the obvious advantages associated with catamarans. If this large deck area is to be effectively utilized, it must behave as a stable platform. Thus, the advantages associated with catamaran hull forms may not be fully realized unless they have good seaworthiness characteristics which can compensate for the increased frictional resistance due to the increased wetted hull surface and the added structural problems resulting from the cross-deck structure between the two hulls." Therefore, there is a definite need to develop analytical techniques to study the motion and hydrodynamic loads of catamaran-type hull vessels. This paper is a summary of the results of their efforts to accomplish this task.

The authors of the second paper were **R.J. Boswell** and **G.G. Cox,** both from the Ship Performance Department at NSRDC, and the title of their paper was "Design and Model Evaluation of a Highly-Skewed Propeller for a Cargo Ship."

This paper presented the design process and model evaluation of a highly skewed propeller as compared to a normal propeller for a modern cargoship. The design process was discussed in detail, including considerations of cavitation, mean and fatigue strength, and propeller-excited vibratory forces. Model experimental results were presented which confirm the validity of the design process and show that the highly skewed propeller possesses propulsion performance comparable to the normal propeller now fitted to the ship, has less tendency toward cavitation erosion than the propeller, and possesses adequate strength for ahead and steady astern operation. Theoretical calculations indicate that the highly skewed propeller will produce lower vibration excitation forces than the propeller currently fitted to the ship.

NASSCO Authors Present Paper On San Clemente-Class OBO At San Diego Section Meeting

Principals shown above at the meeting, left to right: **Melvin F. Good,** secretary-treasurer of the San Diego Section; **George A. Uberti,** Section chairman; Comdr. **Raymond W. Bernhardt,** USCG, papers chairman; **Kenneth Evans,** speaker, and **David R. Rodger,** speaker.

The San Diego Section of The Society of Naval Architects and Marine Engineers held their March meeting at the Rodeway Inn, adjacent to Shelter Island.

After the social hour and a very fine dinner, **Dave Rodger** and **Ken Evans** of National Steel and Shipbuilding Company presented their joint paper on the Design and Construction of the 80,500-dwt OBO (Oil, Bulk, Ore Carrier). This paper discussed both the unusual features peculiar to the OBO, as well as other innovations that have been incorporated into this NASSCO-designed ship. A brief history of the decisions leading up to this design was also given, with Mr. **Evans** representing the hull and Mr. **Rodger** the machinery portions, respectively.

The San Clemente-class OBO is the largest ship to be built on the West Coast, and has the following characteristics: length between perpendiculars, 855 feet; breadth, molded, 105 feet 9 inches; depth, molded, 62 feet 6 inches; draft, full load, 45 feet 11 inches; displacement, full load, 99,310 tons, and deadweight, 81,470 tons.

Boeing Received $16 Million For Jetfoils To Run In Chesapeake And Caribbean

Jetfoil International, Inc., a Washington, D.C. firm, has announced the purchase of four Boeing Jetfoils for use in Chesapeake Bay and the Caribbean. Total value of the contract is in excess of $16 million.

Jetfoil is a 190-passenger 106-ton commercial hydrofoil boat built by Boeing Aerospace Company of Seattle, Wash.

Two of the Jetfoils will be used on a commuter-tourist run linking Annapolis, Md., Norfolk, Va., and Williamsburg, Va., where Anheuser Busch is building an extensive residential and resort complex. Present plans call for a personal rapid transit system to link with the Jetfoil landing, providing an integrated transit system for the resort.

Caribbean ports served by the other two Jetfoils will include San Juan, Puerto Rico; St. Thomas and St. Croix in the U.S. Virgin Islands, and Tortola in the British Virgin Islands. The schedules will allow a full day for shopping and sightseeing in each town.

Tourists may purchase round-trip or single-segment tickets on any of these routes. Fares will be comparable to those for feeder airlines and tour boats operating in the area.

Joseph Goldstein, president of Jetfoil International, Inc., also operates the Wilson Boat Line of Washington, D.C., which carries more than 500,000 passengers during the summer months.

"Last year Puerto Rico received over two-million tourists, but their opportunities to visit other islands were limited by inadequate transportation." Mr. **Goldstein** stated. "Conventional boats are slow and the trips are long and often rough. Earlier hydrofoils provided poor ride quality and suffered chronic unreliability. Even the small airplanes are not what the average tourist pictures as an acceptable means of transportation.

"By comparison, the Jetfoil will offer a comfortable ride at 50 miles an hour in spacious air-conditioned interiors. The fully submerged foils and automatic control system provide a superior ride, regardless of sea or weather conditions."

Jetfoil, which combines Boeing's aviation technology with 14 years of experience in hydrofoil design and building, uses a waterjet propulsion system. To date, other Jetfoils have been sold to Far East Hydrofoil Company, Hong Kong; Marianas Jetfoil, Inc., Guam, and Pacific Sea Transportation of Hawaii.

Panama Bureau Of Shipping Appoints Schmahl And Schmahl

Schmahl and Schmahl, Inc., with headquarters in Fort Lauderdale and offices in Miami, Tampa, and other cities, have been appointed representatives for Florida by the Panama Bureau of Shipping, **Horace W. Schmahl Sr.,** president of the firm, announced.

Schmahl and Schmahl, Inc. are authorized to issue without consular validation Load Line Certificates, Solas Certificates, Radiotelephone and Telegraph Certificates, Safety Certificates, etc., on behalf of the Panama Bureau of Shipping.

The Fort Lauderdale firm, which recently moved into its own office building, also represents Germanischer Lloyd, the Hellenic Register, foreign and domestic underwriters, and the Comite Central des Assureurs Maritimes des France.

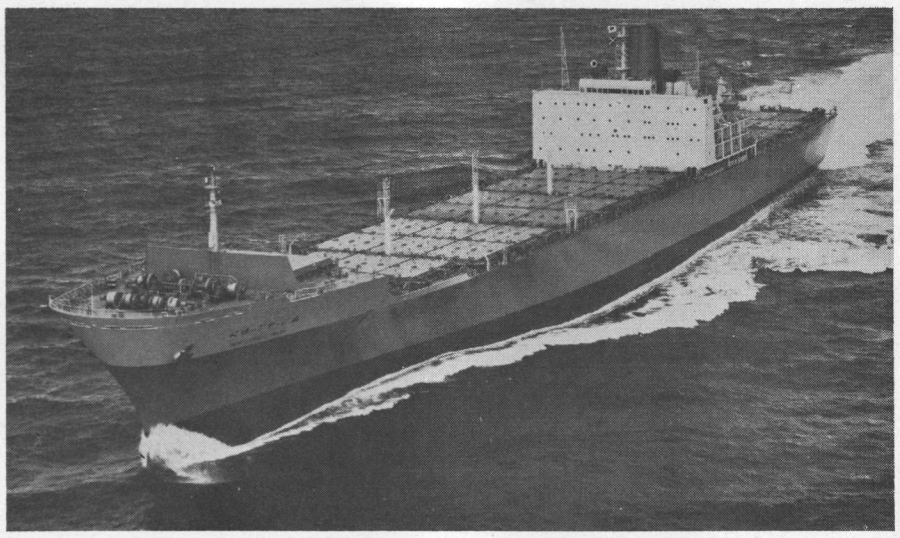
Ocean Fleets Ltd. Names Robert Napier Operations Director

The Honorable **Robert A. Napier** has been appointed director of operations and marine administration, Ocean Fleets Limited, Liverpool, England. He succeeds Capt. **John Smallwood**, who retired from the company at the beginning of April. Ocean Fleets is a member of the Ocean Group.

Mr. **Napier** joined Ocean Transport & Trading Limited (formerly The Ocean Steam Ship Co. Ltd.) as a trainee manager in 1966. He was appointed Group Fleet Deployment Officer, Ocean Management Services, in 1971.

Mr. **Napier** was educated at Winchester College and St. Johns College, Cambridge.

Mitsui Delivers Super-High-Speed Containership



The New Jersey Maru will be placed in service on the Japan/New York route.

The 37,800 - gt super - high - speed containership New Jersey Maru was recently completed at the Tamano Works of Mitsui Shipbuilding & Engineering Co., Ltd., and delivered to her owner, Mitsui O.S.K. Lines Ltd.

The vessel is designed to carry 1,887 containers (including 79 refrigerator containers) at super - high-speed. A twin-engine twin-screw propulsion system with a total output of 69,600 bhp by two Mitsui B&W diesel engines develops a service speed of 26.75 knots, with a maximum trial speed of 29.94 knots. The new containership has a complement of 35 persons.

The approximate measurements are: length overall, 864 feet, molded breadth, 106 feet, and molded depth, 65 feet.

The main features of the New Jersey Maru are:

1. To assure greater container-loading capacity and to use the cargo space of the midship section effectively, the engine room is located as far aft as possible. Five container holds are provided forward of the engine room and two aft.

2. A twin-screw twin-rudder type was adopted to increase ship's maneuvering efficiency in operating at low speed in port as well as passing in narrow channels, and the rudders are installed directly behind the propellers.

3. The living quarters are separated from the work areas. The provision room, dining room, kitchen and smoking room are arranged on the same deck.

4. The main engines are remote-controlled from the wheelhouse and from the control room in the engine room. In the control room, various gages including data loggers required for operating machinery in the engine room are concentrated to enable centralized observation and remote-control of vital machinery.

5. Systems in the engine room are fully automated to acquire the notation "MO" of Nippon Kaiji Kyokai.

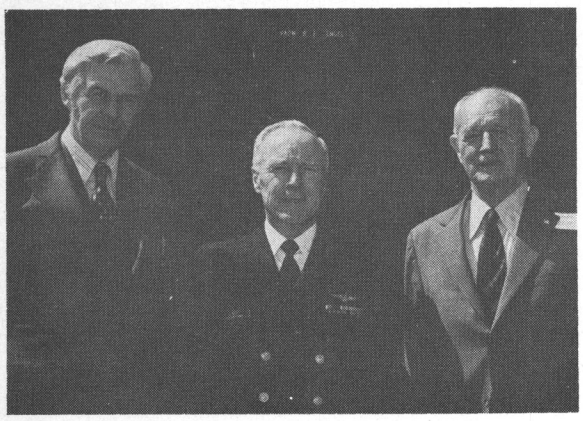
H.M. Tiedemann Elects Nordstrom And Maggio

Henry M. Tiedemann, president of H.M. Tiedemann & Company, New York, N.Y., has announced that at a recent meeting of the board of directors, **Immo-R Nordstrom** was elected vice president-administration and **Albert G. Maggio** was elected assistant vice president in charge of production.

Mr. **Nordstrom** joined Tiedemann & Co. last July and was previously a partner in the firm of Cushing & Nordstrom. Mr. **Nordstrom** is a graduate of Hanover Technische Hochschule, Germany; Tekniska Laroverket, Finland, and the Massachusetts Institute of Technology.

Mr. **Maggio** has been an employee of Tiedemann & Co. for nine years and has taken an active part in the overall administrative and production functions of the company since assuming the position of office manager and manager of design and drafting some years ago. Before joining Tiedemann & Co., Mr. **Maggio** was a senior designer and draftsman with M. Rosenblatt & Son, Inc.

Advisory Committee Organized To Develop Vessel Traffic System For New York Harbor



Capt. **K.C. Torrens** (left) and Adm. **John M. Will,** USN (ret.), (right), two members of the committee, pose with Vice Adm. **B.F. Engel,** Commander, Atlantic Area/3rd Coast Guard Dist. at his headquarters on Governors Island, N.Y.

A major step to create a "vessel traffic system" for waterborne commerce in the waters of the Port Authority of New York and New Jersey was taken on April 6, when 14 representatives of Federal and state governments as well as local maritime interests met for the first time as an advisory committee to the U.S. Coast Guard at Governors Island, N.Y.

Showing a good cross section of maritime interests, the representatives will form the "New York Harbor Vessel Traffic Advisory Committee" and will work with the Coast Guard in building a long-range vessel traffic system to promote safety in the port. Chairman of the committee is retired Navy Adm. **John M. Will,** who is on the Board of Commissioners of Pilots for New York State.

Other members of the committee include: Capt. **Thomas A. King** from the Commerce Department's Maritime Administration; Capt. **K.C. Torrens** from the American Institute of Merchant Shipping; Navy Capt. **R.D. Sante** from the Military Sealift Command; Capt. **Steven M. Seledee** from the American Institute of Marine Underwriters; Army Col. **Harry W. Lombard,** district engineer from the U.S. Army Corps of Engineers; Commodore **Frank Lindner** from the Long Island Sound Commodores' Association; **Alfred Hammon** from the Port Authority of New York and New Jersey; **Howard Lamp'l** from the Federal Environmental Protection Agency; Capt. **Harry C. Breitenfeld** from the United New York Sandy Hook Pilots' Association; Capt. **William H. Burrill** from the Board of Commissioners of Pilots for New Jersey; **Robert Sanders** from the New York Panel, Marine Towing and Transportation Industry; Capt. **L.T. Earl** from the United New Jersey Sandy Hook Pilots' Association, and Capt. **James C. Stillwaggon** from the Interport Pilots' Association.

"This first meeting served to get us all acquainted," Comdr. **H.A. Pledger,** chief of the Third District's Readiness Division and project officer for the vessel traffic system said.

"We are planning our first real 'working' session on June 20 on Governors Island," he continued, "where we'll get into the business of exploring just what kind of a traffic system the harbor really needs." Commander **Pledger** is also serving as coordinator of the committee's activities.

Vessel traffic systems now operate in San Francisco and Puget Sound, with others planned for Houston and New Orleans as well as New York. In both San Francisco and Puget Sound, the system involves the use of radar and shipboard radiotelephones which channel ships' positions into a Coast Guard-manned "operations center." There, the ships' progress through the harbor is traced, and Coast Guard duty officers can alert the ships' masters and pilots to any danger.

"Exactly what form the system will take in New York Harbor will be developed by the committee," Commander **Pledger** said, adding that the committee was hopeful of getting some preliminary stages of the vessel traffic system in operation by late spring of 1974.

Camlock Develops Quick Acting Couplings

A quick means of securing flanges and cover plates in piping circuits and chemical transfer systems has been developed by the Camlock Flange Sales Corp., 449 Sheridan Boulevard, Inwood, N.Y. 11696.

The system uses a limited number of steel helical cams instead of bolts, and incorporates an already positioned "O" ring gasket of a material selected to suit the nature and properties of the fluid to be handled. A standard ASA mating flange is faced to the Camlock Flange, which is self-locating, and a turn by hand of less than one revolution sets each cam and locks the two flanges in a leak-proof seal.

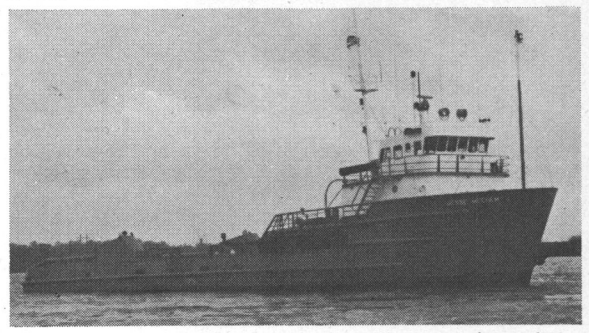
Camlock Couplings are hydrostatically tested to 450 pounds per square inch, and are supplied in the standard form for working pressures of 150 ASA. Greater pressures can be accommodated by the use of heavier flanges and additional cams.

On transfer hose lines and similar applications, the average time required to secure an eight-inch hose connection is less than one minute, with break-away time considerably less.

The helical cam design provides an area contact of considerable efficiency, and the purchase area of three cams, typical for an eight or 10-inch flange, is greater than that given by standard bolting. The coupling can be supplied with studs to secure it permanently to an existing drilled flange, or with a welding or screw neck. Pipe bores in the standard form range from three to 28 inches. Cam units can also be supplied for welding to existing flange equipment and pressure chambers, where quick opening and closing are required.

Camlock Couplings have also increased safety and proved economical when used on extremely low temperature applications, combustible or inflammable liquid petroleum and chemical products. The cryogenic version or the standard Camlock Coupling is constructed with materials that remain unaffected by extremes of temperature. Where flanged connections in conditions of severe frost build up are required, hydraulic actuators can be fitted to assist the operator and facilitate flange break-away.

Halter Marine Delivers New Tug/Supply Vessel For Gulf Of Mexico Service



The 170-foot Jesse Mechem is providing supply and anchor handling services to Shell Oil's operations in the Gulf of Mexico.

Gulf Overseas Marine Corporation has placed into service a new 170-foot tug/supply vessel, the M/V Jesse Mechem, operating for Shell Oil Company in Morgan City, La. The Mechem is powered by two GM 16-V-149 TI diesel engines providing a continuous rating in excess of 2,500 horsepower, driving through Lufkin RS 2512 reduction gears equipped with shaft brakes and controlled with Mathers Air Controls.

Built by Halter Marine in Lockport, La., the vessel has in hull dry-bulk tanks, along with a large clear deck capacity. The vessel is equipped with a SMATCO 225,000# line pull double-drum towing and anchor handling winch with stern roller and complete anchor handling gear. The size, horsepower, carrying capacities, and towing and anchor handling capabilities make the Mechem one of the most versatile vessels sailing in service to the offshore oil industry in the Gulf of Mexico today.

Gulf Overseas Marine will shortly be placing into service a sister ship of the Mechem, the M/V Titusville.

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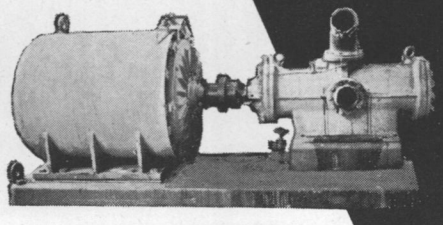

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4-DeLaval horizontal Screw, 700 GPM, 150 PSI, 1180 RPM, with Continental Motors, 100 HP at 1190 RPM, 440/3/60, constant torque, continuous duty, Frame NF746F.

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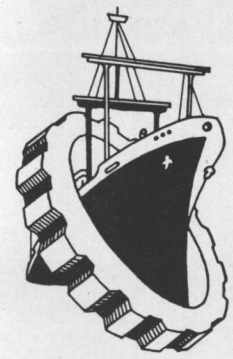

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DORV 618N 10059 RPM ..... 400 KW
Worthington 6097 RPM..... 400 KW
Allis Chalmers 8000 RPM..... 300 KW
Allis Chalmers 5645 RPM..... 300 KW
De Laval 5692 RPM ..... 300 KW
General Electric
DORV 325 5636 RPM..... 300 KW
Joshua Hendy (Terry Design)
HM-5 5965 RPM..... 300 KW
Westinghouse Non-Recessed ..... 300 KW
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Worthington 6097 RPM..... 300 KW
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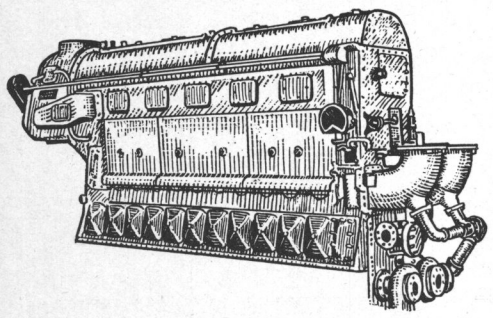

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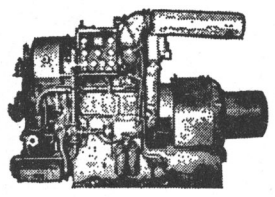
3—COOPER-BESSEMER DIESEL ENGINES, Model LS-8-DR, 1300 HP, 277 RPM, direct reversing, turbo charged.

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

MARINE DIESEL GENERATORS



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

6—SUPERIOR Diesel Engines, Model GBD-8, Marine, 150 HP, 1200 RPM, 8 cylinder, with Delco Generators, 100 KW, 120/240 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, 45/56 KVA, 120/208/3/60.

BUDA, 6DH909, 40 KW, 120 DC.

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

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

BUDA, 6 DHG691, 60 KW, 120 DC.

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

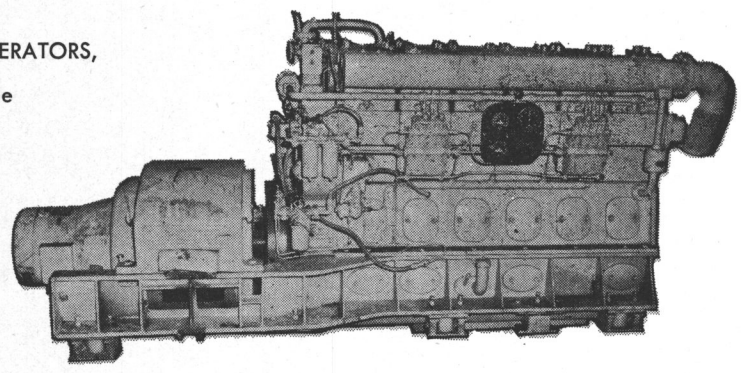
BUDA 6DC844, 75 KW, 125-250 DC.

CATERPILLAR, D17000, 75 KW, 120/240 DC.

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

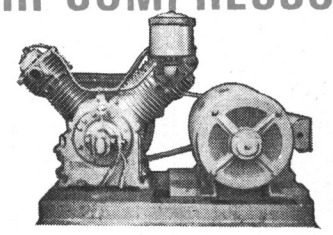
CATERPILLAR, D17000, 85 KW, 220/3/60.

For TURBINE GENERATORS,
See Following Page



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

AIR COMPRESSORS



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

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

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

2—INGERSOLL-RAND, Size 4x1½x3½, 10 CFM, 600 PSI, with Diehl Motor, 7½ HP, 120 Volts DC.

2—WESTINGHOUSE Air Brake Steam, Size 11 x 11 x 12, approximately 60 CFM at 100 PSI.

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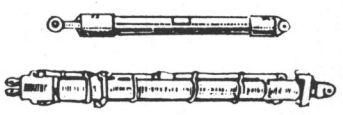

Bore	Overall Stroke	Rod Diameter	retracted length	Action
10"	12"	3.75"	45½"	double
10"	26"	3.75"	58½"	single
2"	8"	1½"	20"	double
2.5"	15"	1.12"	25½"	double
3"	8"	1.37"	1-5½"	double
6"	8'	4"	144"	double

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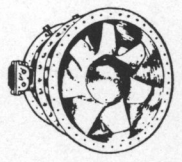

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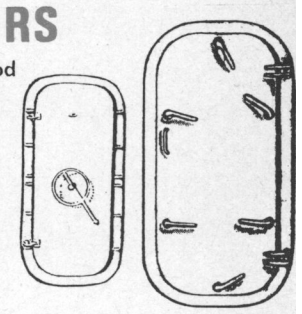

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DE LAVAL Reduction Gear from S/S Texas a C3M ship, Type Double Reduction, 8500 HP size, HP Pinion 5015 RPM, LP Pinion 3461 RPM, low speed gear, 85 RPM.

WESTINGHOUSE Reduction Gear from S/S Montrose, an AP3 ship, size 8500 HP, Gear RPM 85, HP Pinion 5238 RPM, LP Pinion 4422 RPM.

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

WESTINGHOUSE, as orig. used on two 1362 HP electric motors in submarine, 2 pinions, single gear.

FALK Reduction Gears—Port & Starboard, Interchangeable with T-3 Tanker Gears, Falk No. 148-300. Also interchangeable with Falk Gears on AO51 Class Tankers (14 ships). Also on AO97 to AO100 Tankers.

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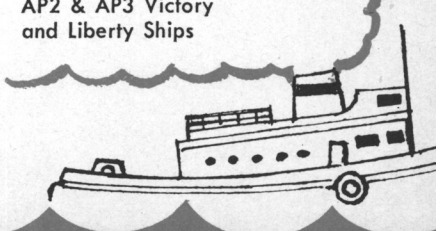

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CAPSTAN WINDLASSES

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

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

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

ANCHOR WINDLASSES

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

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

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

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

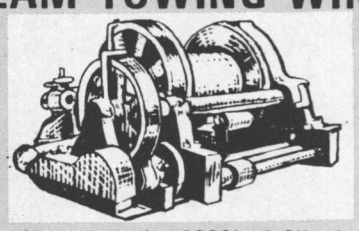
3—HESSE-ERSTED, horizontal, double wildcat, 2⅛" chain, 60 HP, 230 DC.

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

ANCHOR WINCHES

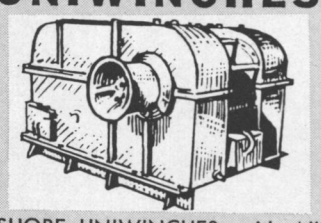
1—JAEGER, single drum—capacity approximately 900' of 1½" wire rope, double gypsy, with 35 HP Motors, 230 Volts DC, complete with electricals.

STEAM TOWING WINCH



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

UNIWINCHES



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

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

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

CARGO HOISTER BLOCKS

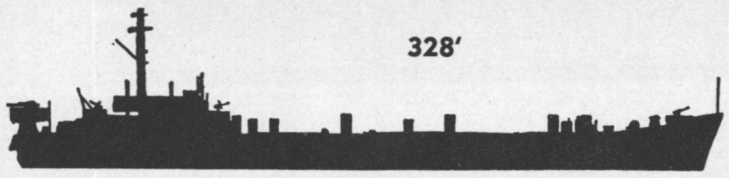
5 ton rated, Steel, as removed from surplus ships. Manufactured by: Young, Draper, etc., 12" & 14" sizes.

$34.50 ea.

$39.50 each with pull test certificates

1—L.S.T. TYPE VESSEL HULL

For Immediate Sale



Steel Hull, 328' overall, 50' extreme beam, maximum draft 14', approximate displacement 1780 tons. To be sold stripped of all machinery and deck house. Located in Portland, Oregon.

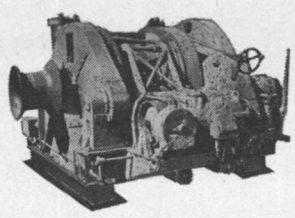
SUBMARINE DIESEL GENERATOR ENGINES

(Without Generators)

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

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

STERN ANCHOR WINCHES



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

Zidell is your "HOT-LINE" to ALL Marine Equipment needs!

If it isn't shown here, please write or phone!

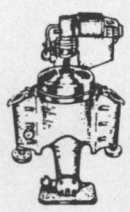
CENTRIFUGES

SHARPLES AND DE LAVAL

150 GPH—440 AC
—230 DC

350 GPH—230 DC

600 GPH—230 DC



Marine Synchronous Motors

8—General Electric, 6000 HP, 2700 Volts, 3 phase, 93⅓ cycles, Type 28, 400 RPM, continuous duty, Typical Serial #5985657.

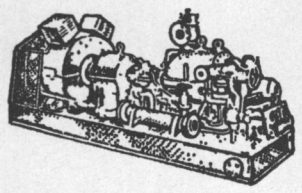
TURBINE GENERATORS

2—DE LAVAL, 360 HP, 440 PSI, 740°F, with Crocker-Wheeler Generators, 250 KW, 240/120 DC, 1200 RPM.

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

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

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



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

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

GENERAL ELECTRIC, Type ATB-2, 1563 KVA, 1250 KW, 450/3/60.

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

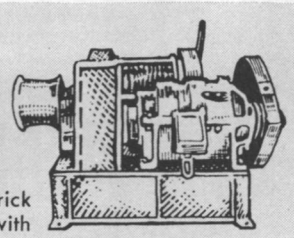
TERRY, TM5, 440 PSI, 740°F, 300 KW, 120/240 DC.

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

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

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

CARGO WINCHES



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

Single Speed, Single Drum

UNIT WINCHES

American Hoist and Derrick Company

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

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

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

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

Contact Ralph E. Ingram, Zidell Explorations, Inc., 3121 S.W. Moody • Portland, Oregon 97201 • Phone 503/228-8691 • Telex 36-05

TERRIFIC INVENTORY... AC & DC

Marine Pumps

CENTRIFUGAL

DC – HORIZONTAL

1—ALLIS-CHALMERS, 40 GPM, 30.2 ft. hd., with Allis-Chalmers Motor, 5 HP, 230 DC, 575/1150/RPM.

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

1—WESTCO, 100 GPM, 100 PSI, 2" suction, 3" discharge, Imperial Motor, 10 HP, 120 DC.

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

1—WARREN, Size 8DM11½, 1175 GPM, 11.1 PSI, with Reliance Motor, 10 HP 230 Volts DC.

1—WORTHINGTON, 3½" suction, 3" discharge, 150 GPM, 23.8 PSI, with Diehl Motor, 3.47 HP, 230 DC, 1750 /3500 RPM.

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

4—WORTHINGTON, Size 8L1, 2100 GPM, 138.5 TDM, 100 HP, 230 DC.

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

5—WORTHINGTON, Size 4L1, 400 GPM, 83' head, 15 HP, 230 DC.

2—ALLIS-CHALMERS, Type 5G, Size 5x5, 650 GPM, 29' head, 7½ HP, 230 DC.

2—ALLIS-CHALMERS, Type SS-L, Size 4x2, 45 GPM, 2 HP, 230 DC.

AC – HORIZONTAL

2—WARREN, 60 GPM, 50 PSI, 1.87 HP, 440/3/60, 3500 RPM.

1—WARREN, 17 GPM, 110 PSI, 3½ HP, 440/3/60, 3500 RPM.

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

1—GARDNER-DENVER, 750 GPM, 360' head, 6" suction, 5" discharge, 3500 RPM, with G.E. Motor, 100 HP, 440/3/60.

1—WARREN, Size 3-SED-8, 150 GPM, 26.2' hd., with Westinghouse Motor, 3.96 HP, 440/3/60.

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

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

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

2—WORTHINGTON, 875 GPM, 10 PSI, 1160/860 RPM, with Westinghouse Motor, 4.45 HP/7.92 HP, 440/3/60.

3—WORTHINGTON, 6" x 6", 550 GPM, 25' head, 6 HP, 440/3/60, 1750 RPM.

2—BUFFALO, 250 GPM, 100 PSI, Class CCS, Size 4 x 3½", with Westinghouse Motors, 25 HP, 440/3/60.

(Continued)

AC – HORIZONTAL

1—GOULDS, 2000 CFM, 470' head, Size 8x10, 350 HP, 2300/3/60.

3—ALLIS-CHALMERS, 35 GPM, 100' head, Size 2x1½, 3 HP, 440/3/60.

DC – VERTICAL

1—AURORA, 4" x 3", with G.E. Motor, 25/40 HP, 230 DC, 1310/1750 RPM.

1—INGERSOLL-RAND, Size 8VCM, 8" suction, 8" discharge, with Westinghouse Motor, 15 HP, 230 DC, 850/ 1210 RPM.

1—INGERSOLL-RAND, 4" suction, 3" discharge, with Westinghouse Motor, 15 HP, 230 DC, 1310/1750 RPM.

1—WARREN, 6" suction, 3" discharge, with G.E. Motor, 5 HP, 440/ 3/60, 1725 RPM.

1—DAYTON-DOWD, 5" suction, 4" discharge, with Century Motor, 15 HP, 230 DC, 1310/1750 RPM.

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

2—ALLIS-CHALMERS, 30 GPM, 208' hd, Type CF2V, 2½" suction, 1½" discharge, 7½ HP, 230 DC.

1—ALLIS-CHALMERS, 12,500 GPM, 10.4 PSI, Type LS-V, Size 20" x 20", 100 HP, 230 DC.

1—ALLIS-CHALMERS, 2520 GPM, 14.4 PSI, Size SE-V, 12" x 12", 30 HP, 230 DC.

2—ALLIS-CHALMERS, 600 GPM, 30 PSI, Type SGV, 5" x 5", 20 HP, 230 DC.

1—ALLIS-CHALMERS, 450 GPM, 120 PSI, 4" x 3", 50 HP, 230 DC.

3—GARDNER-DENVER, 1500 GPM, 56' head, 8" suction, 6" discharge, with 30 HP Motors, 230 DC.

1—WORTHINGTON, Type 20 LAS1, 13,000 GPM, 11:5 PSI, 100 HP, 230 DC.

2—DELAVAL, 80 GPM, 75 PSI, 5/10 HP, 230 DC.

1—WORTHINGTON FIRE & BUTTERWORTH, Size 3 UBS, 400 GPM, 300 PSI, 75 HP, 230 DC.

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

AC – VERTICAL

1—DE LAVAL, 155 GPM, 59.9 PSI, 440/3/60.

1—WARREN, 17 GPM, 55 PSI, with Westinghouse Motor, 4.26 HP, 440/ 3/60.

1—INGERSOLL-RAND, Size 2VHMA, 65 GPM, 75 PSI, 440/3/60.

1—BUFFALO, Size 6, 875 GPM, 10 PSI, 6.3 HP, 440/3/60.

2—WORTHINGTON, 275 GPM, 56.6 PSI, 22.9 HP, 440/3/60.

3—DAYTON-DOWD, 1160 GPM, 15 PSI, 10 HP, 440/3/60.

3—ALLIS-CHALMERS, 68 GPM, 114' head, 7½ HP, 440/3/60.

ROTARY PUMPS

DC – HORIZONTAL

3—NATIONAL TRANSIT, 50 GPM, 50 PSI, 3x2½, with G.E. Motor, 3 HP, 230 DC.

DC – VERTICAL

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

2—QUIMBY, Size 4D, 225 GPM, 50 PSI, 15 HP, 230 DC, 540/740 RPM.

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

2—QUIMBY, Size 6, 500 GPM, 70 PSI, 40 HP, 230 DC.

1—QUIMBY, Size 2½, 17 GPM, 405 PSI, 7½ HP, 230 DC.

2—QUIMBY, Size 5, 400 GPM, 60 PSI, 30 HP, 230 DC.

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

Rotary, AC – Vertical

2—NORTHERN, Size 7020, 10 GPM, 350 PSI, 200 RPM, 3.65 HP, 440/3/ 60, 1720 RPM.

2—BLACKMER, Size IN5INV, 50 GPM, 50 PSI, geared, 2 HP, 440/3/60.

HYDRAULIC PUMPS

WATERBURY, some Model A, some Model B, piston type Pumps, Size 2, Size 5, Size 10, Size 20, Size 50.

BOILER FEED PUMPS-STEAM

Size 11 x 7 x 18 vert. simplex

Size 11 x 7 x 24 vert. simplex

Size 12 x 8 x 24 vert. simplex

Size 12 x 8½ x 12 vert. simplex

Size 14 x 9 x 24 vert. simplex

TURBINE DRIVEN FIRE PUMPS

4—INGERSOLL-RAND, 1200 GPM, 98 PSI, Size 5UV, with Elliott Turbines, 84.3 HP, 3550 RPM, 1 stage, impulse type.

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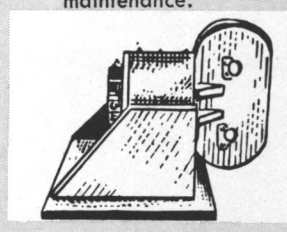
Designed and Manufactured by ZIDELL EXPLORATIONS, INC.

To Give You These Features:

One size fairlead with universal type sheave to accommodate wire rope sizes 1" up to and including 2".

Self Aligning, Swivel Type Head.

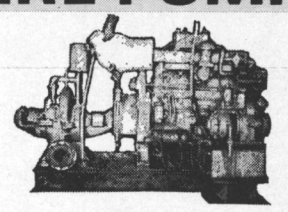
Dependable and Ruggedly built to perform consistently year after year with minimum maintenance.



Model Design
$1350 each

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

FIRE PUMPS



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

CLYDE 17-DE-90 WHIRLEY CRANE

LIFTING RATE: 25 tons at 50 Ft. Radius at 50 to 60 FPM.

BOOM: 80' to headblock (with 10' whip)

WHIP: 10 tons at 125 FPM—2 part line

TRACK CENTERS: 20'—Engine: Cummins HBIS 601, 180 HP supercharged, elec. start

MOTORS: Each leg (4 tot.) 7½ HP, 230 DC.

POWER: Diesel electric (DC)

FORGED STEEL LINE SHAFTING

1000 Tons of miscellaneous line shafting — Call on your requirements.

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Marine Generators

8—General Electric, 4600 KW, 2700 Volts, 93.3 cycles, 3 phase, Form HL, Arm. Amps 984.

ANCHOR CHAIN

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

1-3/8" size
1-1/2" size
2-1/16" size
2-1/4" size
2-5/8" size
2-3/4" size
3-3/8" size

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111′ x 29′ x 12′ 2250 H.P. $1,100,000.00

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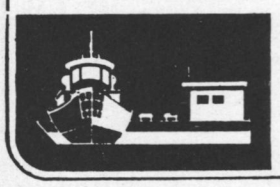

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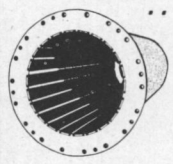

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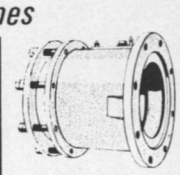

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For A Full Range of Shaft Sizes—*Write for Data*

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5 CIMAVI TYPE VESSELS
for
NON TRANSPORTATION USE

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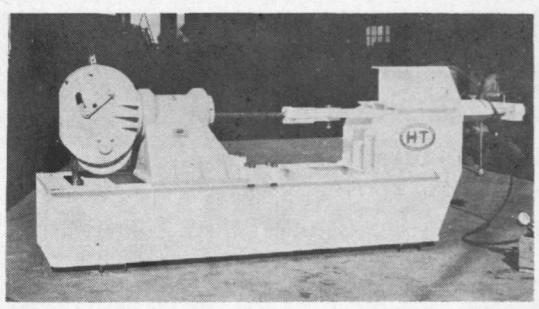

Our Balanced Head Fairleads are tested to break the line at 90° pull. Roller bearings are used throughout. Line sizes from ½″ to 2¼″.

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Ex AOG Tanker M/V Rio Grande

For Non-Transportation Use

Easy Conversion to a floating oil or bulk storage or combination of both. Could be converted to a floating cannery, warehouse, drilling barge, crane ship, breakwater, etc. Has fine lines for easy towing.

Dimensions LOA 310′ Beam 48′ Stowage capacity 2,500 ton (est.). Hull is in sound condition, located Puget Sound. For details, call Gene Anderson.

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DIESEL GENERATORS

Two Diesel Generating Sets complete with heat exchangers. 200 KW, 440 Volts, 60 C. 3 ph. Cooper Bessemer EN 6. Excellent condition. Price One: $10,000—Two: $18,000. Located Jacksonville Shipyard.

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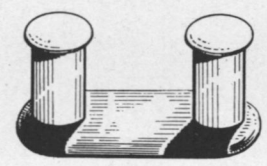
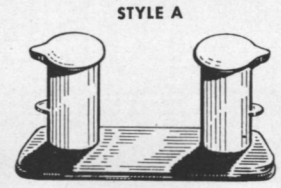
DOUBLE BITTS



STYLE A



STYLE B

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

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

Please Contact: Ralph Ingram

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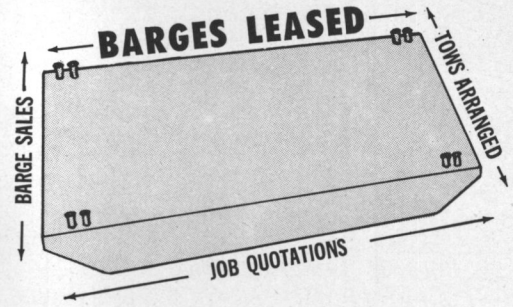
3121 S.W. Moody Ave., Portland, Oregon 97201
Phone: 228-8691, Code 503 — Telex: 36-0503

SERVICE IN ALL DIMENSIONS



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TURBO-GENERATOR SET

100 KW D.C.

TURBINE
MANUFACTURER: Worthington (1962)
MODEL: T2RAGC
RPM: 4533
STEAM: 300 PSIG 622° F. TT

GENERATOR
MANUFACTURER: Westinghouse
VOLTAGE: 115 D.C.
AMPERES: 820
ENCLOSURE: Dripproof
DUTY: Continuous
RPM: 1800
WEIGHT: 11,650 lbs. complete

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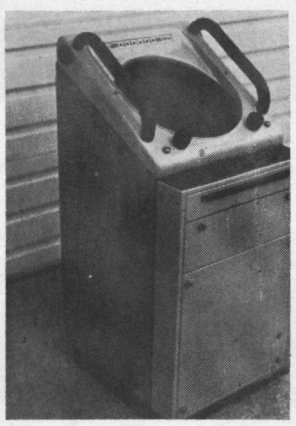

Unused Marine Radars

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The Cadillac of radars, for ships, tugs, yachts, any type vessel. Installation materials included. Nothing else to buy. Parts available. Financing or leasing. $3000 price includes $1000 worth waveguide, accessories, and extras.

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

TURBOGENERATORS

525 KW GENERAL ELECTRIC AUXILIARY TURBOGENERATOR UNIT

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

538 KW WESTINGHOUSE TURBOGENERATOR UNIT

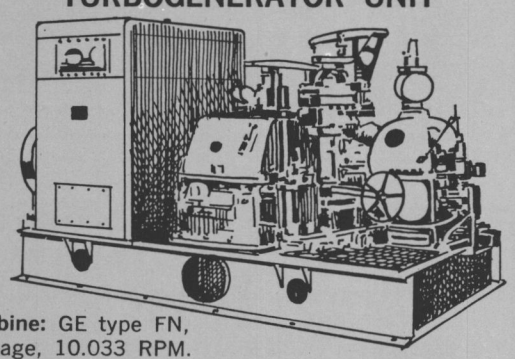
Complete with L.O. Coolers and exciters. **Turbine:** Westinghouse 538 KW, 5010 RPM. Inlet pressure 435 psi. Temp. 750 degrees F.TT. Exhaust pressure 28½ hg vac. **Generators:** (1) 400 KW, 450 VAC, 3 pole, 60 cycle, PF 80%, 1200 RPM, ship's service. (2) 32.5 KW, 125 VDC, 1200 RPM, variable voltage exciter.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

535 KW GENERAL ELECTRIC TURBOGENERATOR UNIT

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

★★ ALSO AVAILABLE!! ★★

600 KW GENERAL ELECTRIC TURBOGENERATOR UNIT



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

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

MAIN MOTOR FOR T2

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

5400 KW MAIN GENERATOR

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

PUMP UNITS

CARGO STRIPPING PUMP

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

MAIN FEED PUMP

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

MAIN FEED PUMP

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

MAIN CIRCULATING PUMP

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

MAIN CIRCULATING PUMP

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

MAIN CARGO PUMP UNIT

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

FUEL AND LUBE OIL PUMP

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

LUBE OIL SERVICE PUMP

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

MAIN CONDENSATE PUMP

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

AIR COMPRESSORS

COMBUSTION CONTROL AIR COMPRESSOR UNIT

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

SHIP SERVICE AIR COMPRESSOR UNIT

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

VALVES

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

TURBINE ROTORS

5400 KW GENERAL ELECTRIC TURBINE ROTOR

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

525 KW GENERAL ELECTRIC TURBINE ROTOR

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

5400 KW WESTINGHOUSE TURBINE ROTOR

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

5400 KW WESTINGHOUSE MAIN TURBINE (Profile type):

5400 KW ELLIOTT TURBINE ROTOR

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

MISCELLANEOUS T-2 EQUIPMENT

MAIN AIR EJECTOR

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

MAIN CONDENSER END

Graham (waterbox).

MAIN CONDENSER END

Westinghouse (waterbox).

MAIN CONDENSER END

Westinghouse (return head).

AUXILIARY CONDENSER END

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

TAIL SHAFTS

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

RUDDER WITH STOCK (complete)

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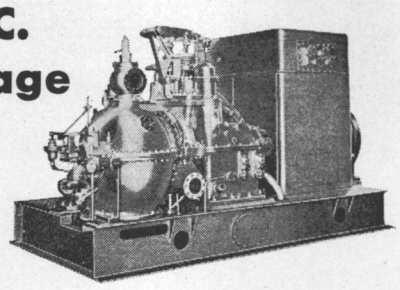
TURBINE GENERATORS
A.C. Voltage



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

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

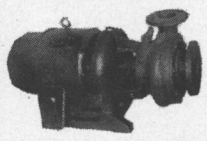
4-500 KW, General Electric. Turbine: Type FN3-FN20, steam 375/425 PSI, 6 Stage, 9987 RPM. Generators: 500 KW, 450/3/60, 1200 RPM, Type ATI.

Used, Clean, Good Condition

Please Contact: Ralph Ingram

ZIDELL
EXPLORATIONS, INC.
3121 S.W. Moody Ave., Portland, Oregon 97201
Phone: 228-8691, Code 503 — Telex: 36-0503

UNUSED 375 G.P.M. ALLIS-CHALMERS PUMP



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

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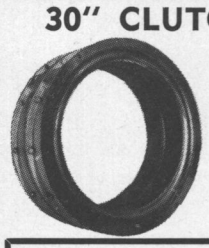
30" CLUTCH DRUM TIRES FOR FALK GEAR



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

$475 each

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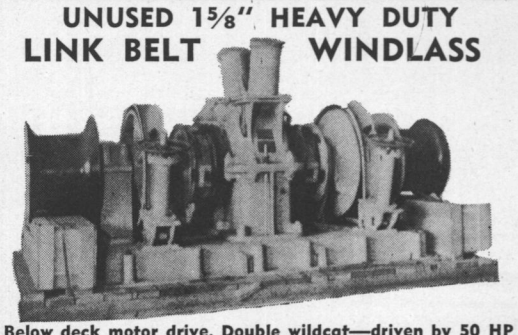
UNUSED 1⅝" HEAVY DUTY LINK BELT WINDLASS



Below deck motor drive. Double wildcat—driven by 50 HP 230 VDC motor with vertical shaft and worm drive. Single speed—handles 7000 lb anchors and 60 fathoms of 1⅝" chain at 7 fathoms per minute. Wildcat centers 56". Complete with all controls and warping features. Total weight 27,500 lbs. With spares.

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ANCHOR WINCHES FOR SALE

2—Manitowac model 390 2-drum Winches with 280 HP Cummins diesel engines and Twin Disc torque converters. 76,000 lb. line pull. All air controls—double brake bands. Set up for one man operation. 3 years old. Top condition.

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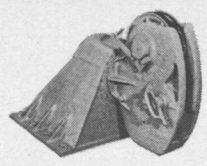

Deck-Mounted BERGER FAIRLEADS

Model 614—1¼" line size — 14" sheave — 5" shank opening. Tapered roller bearings. 985 lbs. Approximate base dimensions: 32" x 24" fore and aft.

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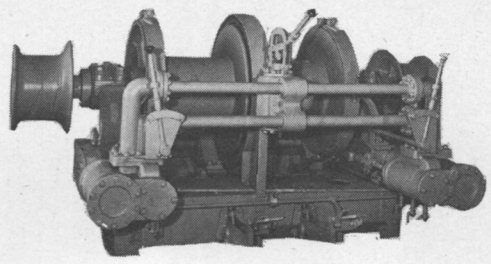
CLYDE 7 x 10 DOUBLE DRUM WINCHES



Drum 8500 lbs @ not less than 120 FPM; 13,000 lbs at no specific speed. Gypsy head 22,500 lbs static pull. Foot brake to hold 17,000 lb. pull. Steam cylinders with standard 250 PSI.

DIMENSIONS:
9' 5¾" wide over winch heads
5' 10½" wide over bedplate
4' 1" deep over bedplate
6' 5" overall—brake pedal, etc.
2" steam—2" exhaust

Drums 16" diameter—20" wide—33 13/16" over flanges. Rebuilt by U.S.N. equal to new.

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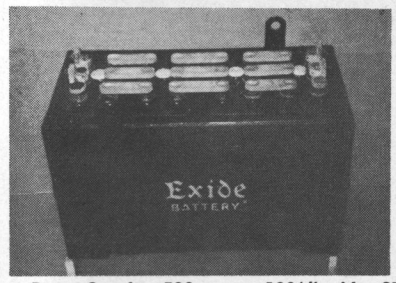
SPECIAL!
BATTERIES
NEW SURPLUS BARGAIN



Heavy Duty, 8 volts, 500 amps, 13¾" wide, 27¼" long, 18" high. Weight in case, 488 lbs.

AL EPSTEIN, INC.
Most Anything in Marine Supplies
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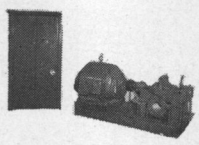
1000 GPM—125 LB
BRONZE FAIRBANKS-MORSE FIRE & GENERAL SERVICE PUMP



PUMP: Mfg by Fairbanks-Morse.. Horizontally split case — 1000 GPM—281' head — 3545 RPM. Suction pressure flooded—6" suction—5" discharge. Steelflex coupling. MOTOR: Fairbanks-Morse—440/3/60—squirrel cage—3600 RPM—class A insulation. Type KZK—continuous duty—dripproof—ambient temp. 50°C. Complete with Cutler-Hammer controller (reduced voltage magnetic starter). DIMENSIONS: 5' 5" OAL—23" OAW—2' 11" OAH. UNIT HAS HAD VERY LITTLE USE.

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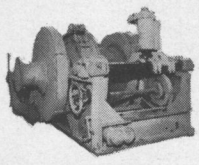
100,000 lb. Almon Johnson Constant Tension Mooring Winches



5 Available. In very good condition. Series 232 mooring & anchoring winches—automatic self-tensioning. Wide range from 100,000 lb line pull at 10 FPM to 26,000 lbs at 400 FPM. Gypsy line pull 12,000 lbs at 125 FPM. Drum declutchable through spiral jaw clutch for free spooling. Driven by 50 HP—230 VDC motors—Westinghouse CK—575 RPM—½ hour—75°C rise—stab. shunt—181 amps—max. RPM 1900. Cutler-Hammer brake—18"—type NM. Complete with magnetic control panel, resistor banks & remote control pedestal—mounted master switch.

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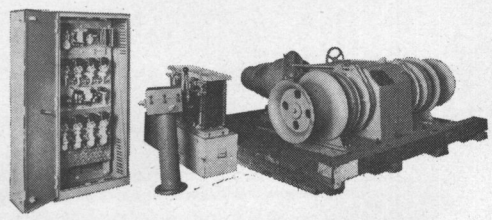
UNUSED 1-5/16" IDEAL WINDLASS



For 1-5/16" chain—on 36" centers. 15 H.P.—115 volts DC—1750 R.P.M.—6000 lb. line pull.

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Carboline Co., 328 Hanley Industrial Court, St. Louis, Mo. 63144
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Bently Nevada Corp., P.O. Box 157, Minden, Nevada 89423
MARINE BLOCKS & RIGGING
Crosby Group, Box 3128, Tulsa, Okla. 74101
MARINE DRIVES—GEARS
Hoffert-Lowe, Inc., 108 Ridge Road, North Arlington, N.J. 07032
Philadelphia Gear Corp., Schuylkill Expressway, King of Prussia, Pa. 19406
Western Gear Corp., Industrial Products Div., P.O. Box 126, Belmont, Calif. 94003
MARINE EQUIPMENT
Comet Marine Supply Corp., 157 Perry St., New York, N.Y. 10014
Homelite Corporation, 70 Riverdale Ave., Port Chester, N.Y. 10573
ITT Henze Service, P.O. Box 1745, Mobile, Ala. 36610
Kearfott Marine Products, 780 South 3rd Ave., Mt. Vernon, N.Y. 10550
Nicolai Joffe Corp., P.O. Box 2445, 445 Littlefield Ave., So. San Francisco, Calif. 94080
Merrin Electric, 162 Chambers St., New York, N.Y. 10007
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742
Stow Mfg. Co., 225 Shear St., Binghamton, N.Y. 13902
Vokes Filter Div., (Cardwell Machine Co.), Cardwell and Castlewood Rd., Richmond, Va. 23221
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wis. 53186
MARINE FURNITURE
Bailey Joiner Co., 115 King Street, Brooklyn, N.Y. 11231
MARINE INSURANCE
Adams & Porter, Cotton Exchange Bldg., Houston, Texas
Midland Insurance Co., One State St. Plaza, New York, N.Y. 10004
R.B. Jones Corp., 301 West 11th St., Kansas City, Mo. 64105
MARINE OIL BURNERS
John Zink Co., 4401 So. Peoria, Tulsa, Okla. 74105
MARINE PROPULSION
Babcock & Wilcox Co., 161 East 42nd Street, New York, N.Y. 10017
Combustion Engineering, Inc., Windsor, Connecticut 06095
Jacuzzi Bros., Inc., 11511 New Benton Highway, Little Rock, Ark. 72204
Murray & Tregurtha, Inc., 2 Hancock St., Quincy, Mass. 02171
Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523
Tech Systems, Inc., 405 Watertown Rd., Thomaston, Conn. 06787
Turbo Power & Marine Systems, Subsidiary of United Aircraft Corp., 1690 New Britain Ave., Farmington, Conn. 06032
MARINE SURVEYORS
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Fla. 33316
MARITIME FINANCING—Leasing
General Electric Credit Corp., 4 Corporate Drive, White Plains, N.Y. 10604
Rhode Island Hospital Trust National Bank, 15 Westminster Street, Providence, R.I. 02903
NAVAL ARCHITECTS AND MARINE ENGINEERS
J. L. Bludworth, 4030 Wynne St., Houston, Texas
Breit Engrg. Inc., 441 Gravier St., New Orleans, La. 70130
James G. Bronson Associates, 166 Altamont Ave., Tarrytown, N.Y. 10591
Childs Engineering Corp., Box 333, Medfield, Mass. 02052
Coast Engineering Co., 711 W. 21st St., Norfolk, Va. 23517
Crandall Dry Dock Engrs., Inc., 238 Main St., Cambridge, Mass. 02142
Francis B. Crocco, Inc., Box 1411, San Juan, Puerto Rico
C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048
Arthur D. Darden, Inc., 1040 International Trade Mart, New Orleans, La. 70130
Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119
Designers & Planners, Inc., 114 Fifth Ave., New York, N.Y. 10011
M. Mack Earle, 103 Mellor Ave., Baltimore, Md. 21228
Christopher J. Foster, 14 Vanderventer Ave., Port Washington, N.Y. 11050
Friede and Goldman, Inc., 225 Baronne St., New Orleans, La. 70112
Gibbs & Cox, Inc., 21 West St., New York, N.Y. 10006
John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110
Morris Gurainick, Associates, Inc., 583 Market St., San Francisco, Calif. 94105
J. J. Henry Co., Inc., 90 West St., New York, 10006
Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, Calif. 93017
C.T. Ilariucci & Associates, Tourism Pier #3, San Juan, P.R. 00902
Jantzen Engineering Co., 15 Charles Plaza, Baltimore, Md. 21201
James S. Krogen, 2500 S. Dixie Hwy., Miami, Fla. 33133
Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460
Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 1180 Ave. of Americas, N.Y., N.Y. 10036
Marine Design Associates, P.O. Box 2674, Palm Beach, Florida
Rudolph F. Matzer & Associates, Inc., 13891 Atlantic Blvd., Jacksonville, Fla. 32225
John J. McMullen Associates, Inc., 1 World Trade Center, New York, N.Y. 10048
George E. Meese, 194 Acton Rd., Annapolis, Md. 21403
Metritape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742
Robert Moore Corp., 350 Main St., Port Washington, N.Y. 11050
Nickum & Spaulding Associates, Inc., 71 Columbia St., Seattle, Wash. 98104
Ocean-Oil International Engrg. Corp., P.O. Box 6173, New Orleans, La. 70114
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156
S.L. Petchul, Inc., 8-D So. New River Drive East, Ft. Lauderdale, Fla. 33301
Potter & McArthur, Inc., 253 Northern Ave., Boston, Mass.
M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013 and 657 Mission St., San Francisco, Calif.
George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007
T. W. Spaetgens, 156 West 8th Ave., Vancouver 10, Canada
R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wisc. 54235
Richard R. Taubler, 44 Court St., Brooklyn, N.Y. 11201
H. M. Tiedemann & Co., Inc., 74 Trinity Pl., New York, N.Y. 10006
Whitman, Requardt & Associates, 1304 St. Paul St., Baltimore, Md. 21202
Yankee Shipwrights, P.O. Box 35251, Minneapolis, Minn. 55435
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American Hydromath Co., 55 Brixton Rd., Garden City, N.Y. 11530
Collins Radio Co., M/S 407-321, Dallas, Texas 75207
Edo Western Corporation, 2645 South 2nd West, Salt Lake City, Utah 84115
ELCO Corp./Safecraft Division, Maryland Road & Computer Ave., Willow Grove, Pa. 19090
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Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
ITT Decca Marine, Inc., 386 Park Ave. South, New York, N.Y. 10016
ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611
Lorain Electronics Corp., 2307 Leavitt Road, Lorain, Ohio 44052
Magnavox Navigation Systems, 2829 Maricopa St., Torrance, Cal. 90503
National Marine Service, 1750 So. Brentwood Blvd., St. Louis, Mo.
Radiomarine Corp., 20 Bridge Avenue, Red Bank, N.J. 07701
Raytheon Co. Marine Products, 676 Island Pond Rd., Manchester, N.H. 03103
Raytheon Co., Submarine Signal Div., P.O. Box 360, Portsmouth, R.I. 02871
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.
Standard Communications Corp., 639 N. Marine Ave., Wilmington, Calif. 90744
Teledyne Hastings Raydist, P.O. Box 1275, Hampton, Va. 23361
Tracor, Inc., 6500 Tracor Lane, Austin, Texas 78721
The Waterways Co., 3512 Metairie Hts. Rd., New Orleans, La. 70002

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ESSO International, Inc., 1251 Avenue of the Americas, N.Y. 10020
Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
Texaco, Inc., 135 E. 42nd St.. New York, N.Y. 10017

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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
International Paint Co., 21 West St., New York, N.Y. 10006
Patterson-Sargent, P.O. Box 494, New Brunswick, N. J.
Porter Paint Company, 400 South 13th Street, Louisville, Ky. 40203
Transocean Marine Paint Association, P.O. Box 456, Delftseplain 37, Rotterdam, Holland

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Independent Petroleum Supply Co., 1345 Ave. of Americas, New York, N.Y. 10019
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
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The West Indies Oil Co., Ltd., St. John's, Antigua, W. I.

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

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

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

PROPELLERS: NEW AND RECONDITIONED
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Coolidge Propellers, 1601 Fairview Ave. East, Seattle, Wash. 98102
Escher Wyss Gmbh, P.O. Box 798, Ravensburg, Germany
Federal Propellers, 1501 Buchanan Ave. S.W., Grand Rapids, Mich. 49502
Ferguson Propeller, 1132 Clinton St., Hoboken, N.J. 07030

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

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

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Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231

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Du Pont Co., Room 31H1, Wilmington, Delaware 19898
Jackson Rope Corp., 9th & Oley, Reading, Pa. 19604
Wall Rope Works, Inc., Beverly, N. J. 08010

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Galbraith-Pilot Marine Corp., 600 Fourth Ave., Brooklyn, N.Y. 11215
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913
Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011
Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

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

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Jered Industries, Inc., 1300 S. Coolidge Rd., Birmingham, Mich. 48008
Koehler-Dayton, Inc., P.O. Box 309, New Britain, Conn. 06050
LaMere Industries, Inc., 277 N. Main Street, Walworth, Wis. 53184

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

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

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

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Agemar, P.O. Box 1465, Maracaibo, Venezuela
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
Mowbray's Tug and Barge Sales Corp., 21 West St., N.Y., N.Y. 10006
Oaksmith Boat Sales, Inc., Fisherman's Terminal, Seattle, Wash. 98119

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

SHIPBUILDING—Repairs, Maintenance, Drydocking
Astilleros Espanoles, S.A. Zurbano, 70, Madrid 10, Spain
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150
Barbour Boat Works, Inc., P.O. Box 1069, New Bern, N.C.
Beliard, Crighton & Cie, P.O. Box 2074, Route des Docks, 59, Dunkirk, France
Beliard Murdoch S. A., Kattendijkdok Westkaai 21, Antwerp, Belgium
Bertram Marine, Division of Whittaker, 3663 N.W. 21 Street, Miami, Fla. 33142.
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004
Blount Marine Corp., P.O. Box 360, Warren, Rhode Island 02885
Bludworth Shipyard, Inc., Box 5426, Cypress St., Brady Island, Houston, Texas 77012
Carrington Slipways Pty. Ltd., Tomago, N.S.W. 2322, Australia
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Curacao Drydock, Inc., P.O. Box 153, Willemstad, Curacao, N.A.
Devcon Corporation, Endicott Street, Danvers, Mass. 01923
Dravo Corporation, Neville Island, Pittsburgh 25, Pa.
Empressa Nacional Bazan, 65 Castellana, Madrid 1, Spain
Equipment Systems, Inc., A Microdot Co., P.O. Box 95, Port Deposit, Md. 21904
Equitable Equipment Co., Inc., P.O. Box 8001, New Orleans, La. 70122
General Dynamics, Electric Boat Division, 99M Eastern Point Road, Groton, Conn. 06340
General Dynamics, Quincy Division, Quincy, Mass. 02169
Halter Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126
Havre de Grace, Havre de Grace, Md.
Hillman Barge & Construction Co., Grant Bldg., Pittsburgh 19, Pa.
Hongkong & Whampoa Dock Co. Ltd., Kowloon Docks, Hong Kong
Ishikawajima-Harima Heavy Industries Co., Ltd., 15 William St., New York, N.Y. 10005
Jacksonville Shipyards, 644 E. Bay St., Jacksonville, Fla. 32203
Jeffboat, Inc., Jeffersonville, Ind. 47130
Kawasaki Dockyard Co., 8 Kaigon-dori, Ikuta-ku, Kobe, Japan
Kelso Marine, Inc., P.O. Box 268, Galveston, Texas 77550
Keppel Shipyard (Private) Ltd., P.O. Box 2169, Singapore
Kockums Malmo, Fack, Malmo, Sweden
Litton Industries, 9920 W. Jefferson Blvd., Culver City, Calif. 90230
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134
Marathon Manufacturing Company
Marathon LeTourneau Offshore Company, 1700 Marathon Building, 600 Jefferson, Houston, Texas 77002
Marathon LeTourneau Gulf Marine Division, P.O. Box 3189, Brownsville, Texas 78520
Marathon LeTourneau Marine Division, LeTourneau Rural Station, Vicksburg, Mississippi 39180
Marathon LeTourneau Offshore Pte., Ltd., P.O. Box 83, Taman Jurong Post Office, Singapore 22, Singapore
Marathon Shipbuilding Company, P.O. Box 870, Vicksburg, Miss. 39180
Marathon Shipbuilding Company (U.K.) Ltd., Clydebank Bunbartonshire, G81-1YB, Scotland
Maryland Shipbuilding & Drydock, P.O. Box 537, Baltimore, Md. 21203
Matton Shipyard Co., Inc., P.O. Box 428, Cohoes, New York 12047
Mitsui Shipbuilding & Engrg. Co. Ltd., 6-4, Tsukiji 5-chome, Chuo-ku, Tokyo, Japan
Mitsubishi Heavy Industries, Ltd., 5-1 Marunouchi 2-chome, Chiyoda-ku, Tokyo, Japan
Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655
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Paceco, Div. Fruehauf Corp., 2350 Blanding Ave., Alameda, Calif. 94501
Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, Fla. 33156
Perth Amboy Dry Dock Co., Perth Amboy, N.J. 08862
St. Louis Shipbuilding—Federal Barge, Inc., 611 East Marceau, St. Louis, Mo. 63111
Sasebo Heavy Industries Co., Ltd., New Ohtemachi Bldg., Chiyoda-ku, Tokyo, Japan
Savannah Machine & Shipyard Co., P.O. Box 787, Savannah, Ga. 31402
Sembawang Shipyard (Pte) Ltd., P.O. Box 3, Sembawang, P.O. Singapore, 27
Slocum Iron Works, Inc., P.O. Box 2506, 1752 Telegraph Road, Mobile, Ala. 36601
Sumitomo Shipbuilding & Machy. Co., Ltd. 2-1 Ohtemachi 2-chome, Chiyoda-ku, Tokyo, Japan
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Teledyne Sewart Seacraft, P.O. Box 108, Berwick, La. 70342
Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004
Tracor/Mas, Inc., P.O. Box 13107, Port Everglades, Fla. 33316
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McDonough Marine Service, P.O. Box 26206, New Orleans, La.
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L. Smit & Co., 11 Broadway, New York, N.Y. 10004
Suderman & Young Towing Co., 329 World Trade Center, Houston, Texas 77002
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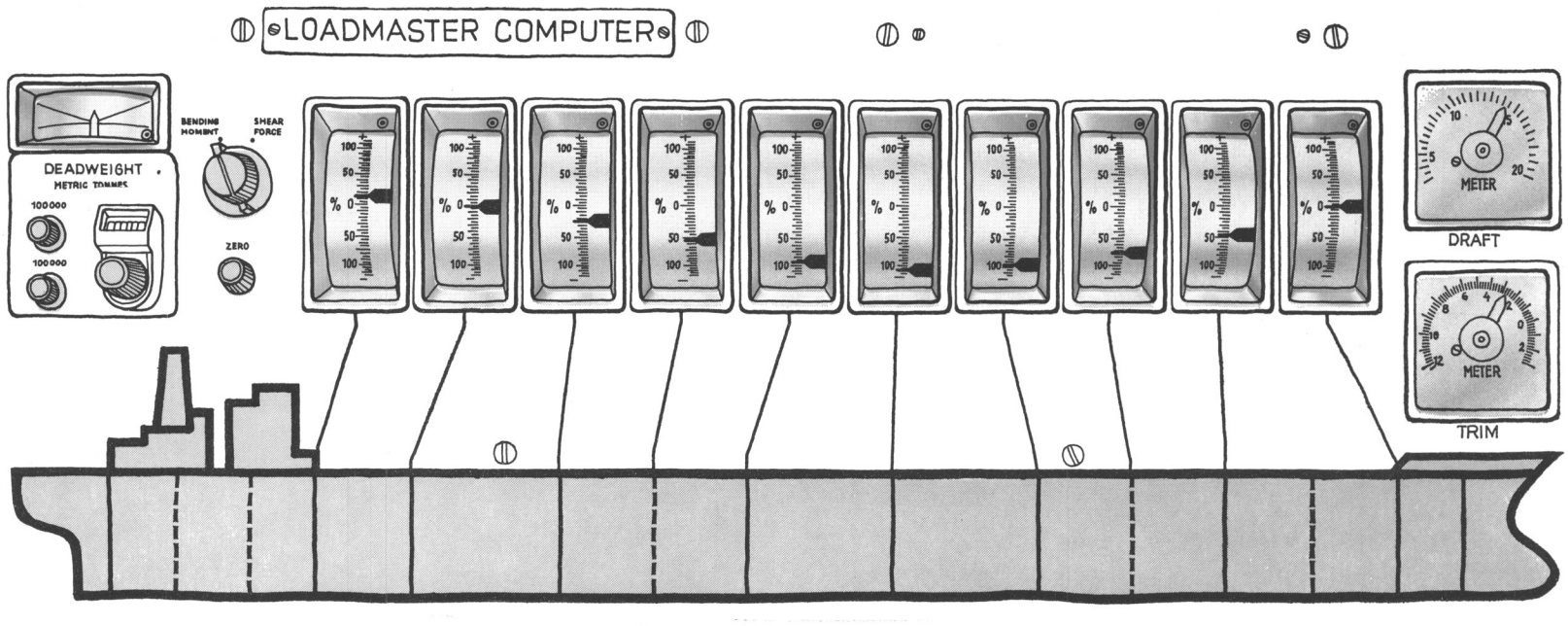

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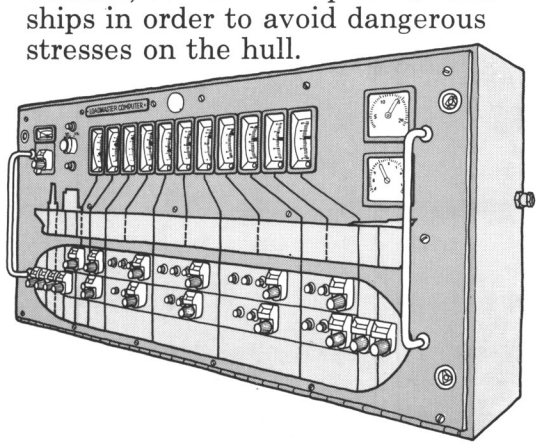

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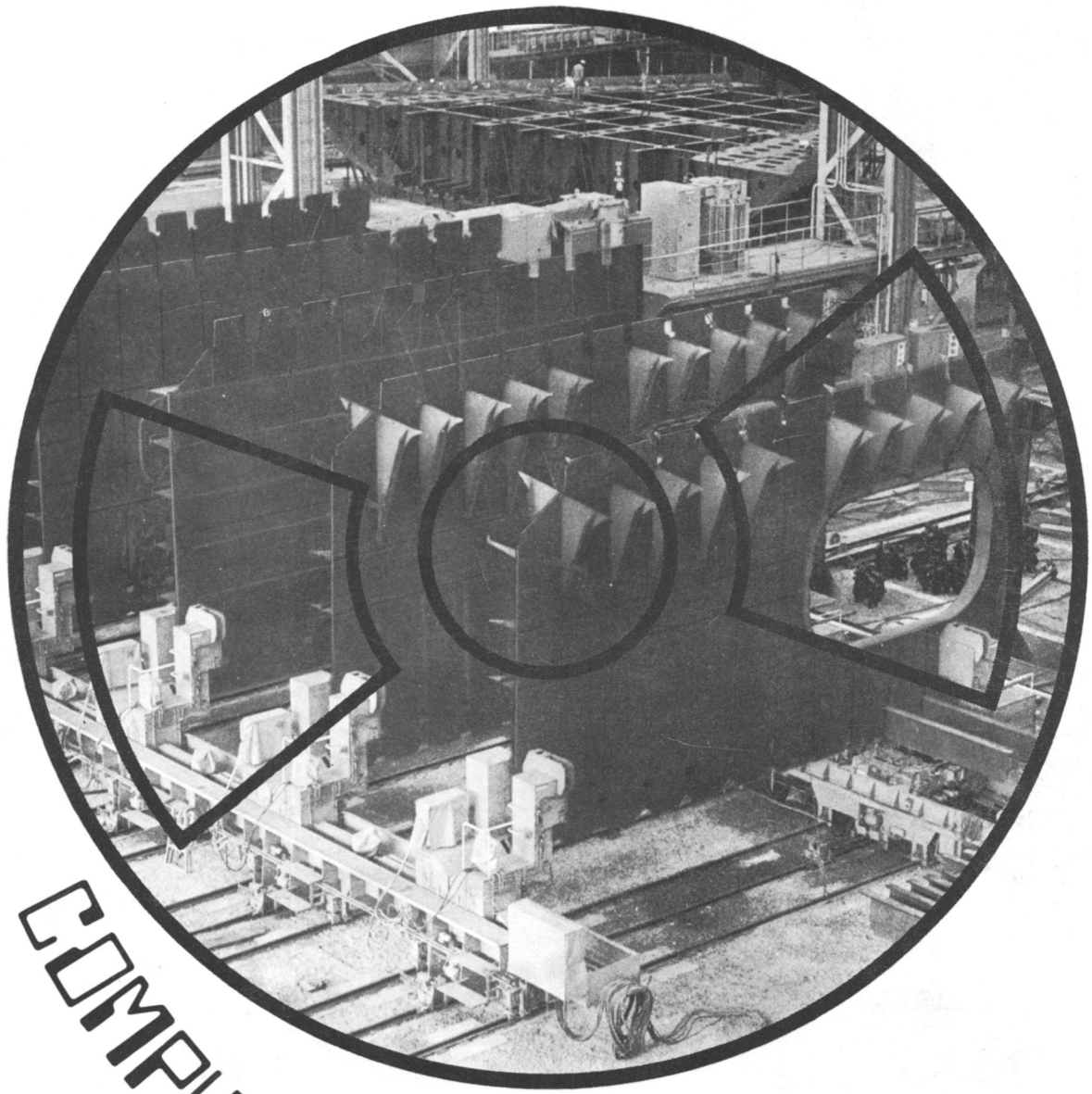

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