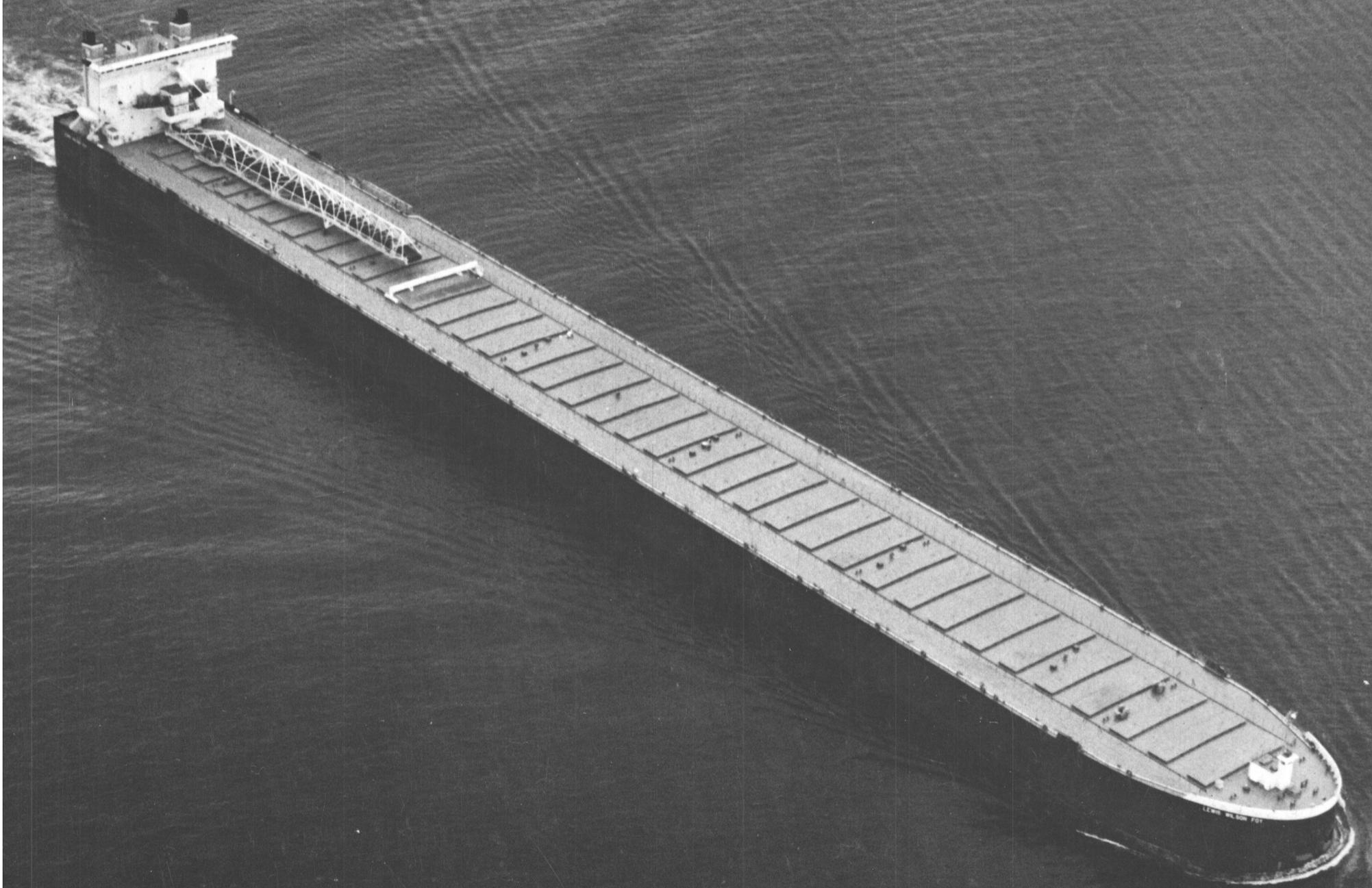


# MARITIME REPORTER AND ENGINEERING NEWS



M/V Lewis Wilson Foy

**Bay Shipbuilding Delivers  
1,000-Foot Bulk Carrier To  
Bethlehem Steel Corporation**

(SEE PAGE 7)

**AUGUST 1, 1978**

# Introducing the NEW Solid State, Galbraith-Pilot Marine "SEA WATCH SEVEN" Single Point Monitoring Salinity Control System

The GPM®  
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measures and controls the  
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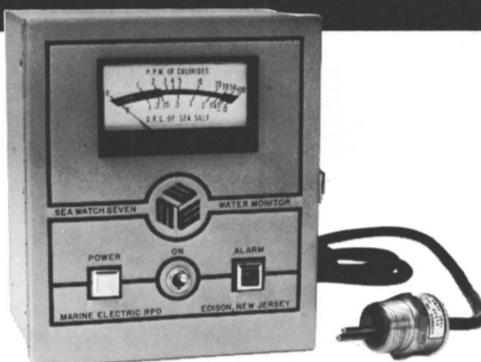
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## GPM® Salinity Systems meet the strictest standards in the world:

The U.S. Public Health Service, the British Board of Trade, the U.S. Coast Guard, the American Bureau of Shipping, Det Norske Veritas, to name a few.



## GPM® Salinity Systems have built-in safeguards against false alarms:

Instantaneous automatic temperature compensation and vibration-proof alarm-point settings.

## GPM® has the flexibility to meet every Salinity control requirement:

Systems are readily adaptable to centralized control and automated ship concepts, compatible with any freshwater generating equipment, available in any measuring system—metric, English, or chemical, in an endless variety of panel configurations.

**What's more, GPM® never abandons a system!** We backup every system with worldwide air service parts replacement. Parts can be on the pier before a ship arrives at its destination.

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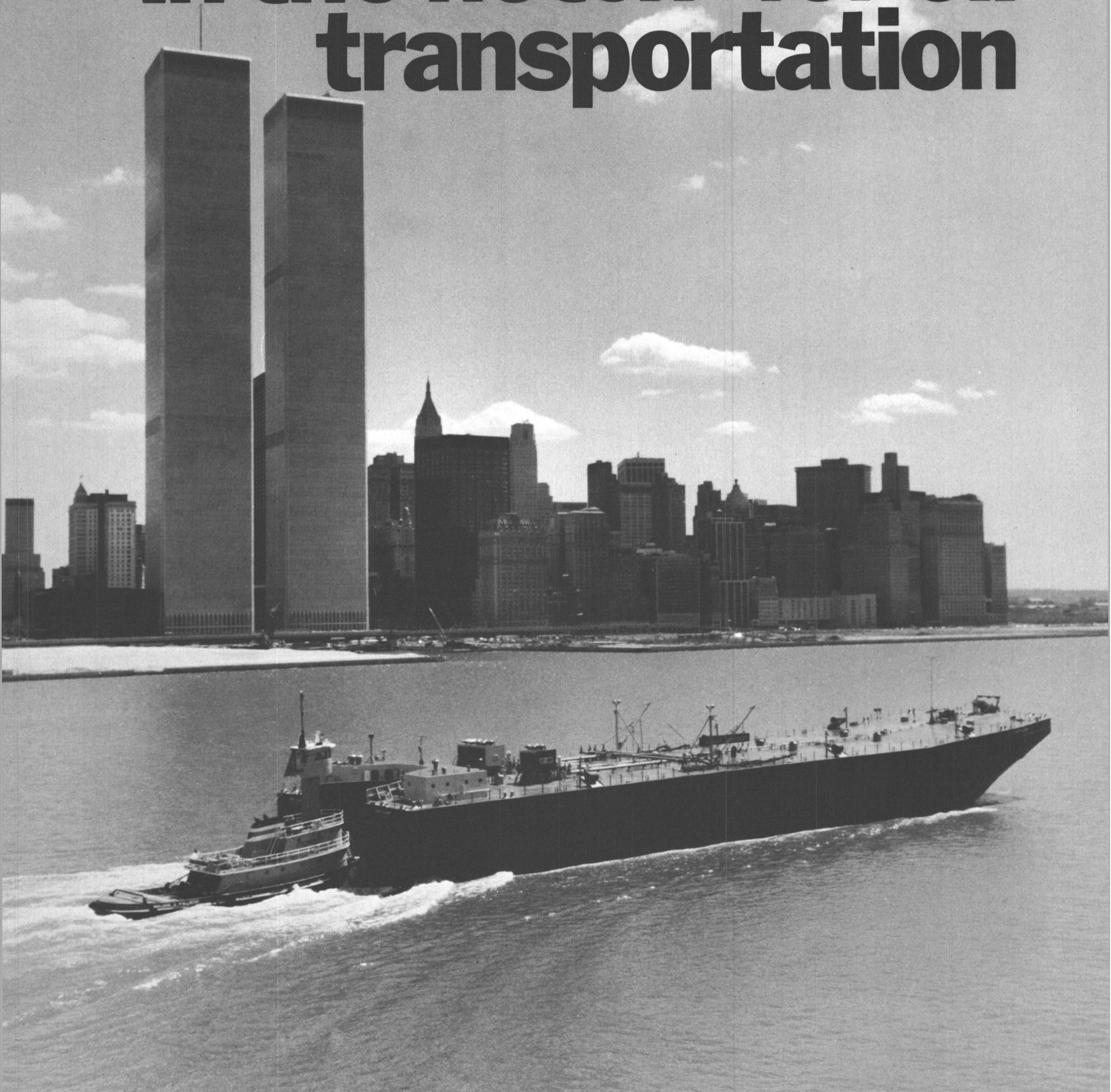
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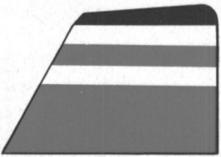
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## Dillingham Of Guam Bids \$294,000 To Repair GPA Barge Inductance

Dillingham Corporation of Guam will repair the barge Inductance for Guam Power Authority.

The barge Inductance, owned by the Navy, is leased by Guam Power Authority as part of the Navy-GPA power pool agreement for joint operation of the island's power system.

Such an agreement also makes GPA responsible for maintenance and overhaul of the Inductance. Dillingham Corporation of Guam is part of the Dillingham Maritime Group whose headquarters are in Honolulu, Hawaii. As successful bidder, Dillingham Guam's bid was \$294,499.

It was also announced that a Marianas contract was awarded to Dillingham Corporation of Guam to tow a fuel barge between Guam and Saipan for the Government of Guam.

**Jim Sterling**, senior vice president-Shipyard Operations, who is in charge of Dillingham Corporation of Guam, stated that more emphasis is being placed on ship repair in Guam. According to Mr. Sterling, Guam is the last stop when headed west, or to the Far East where the U.S. flag is flying.

Dillingham also has a ship repair facility in Honolulu and in Portland, Ore.

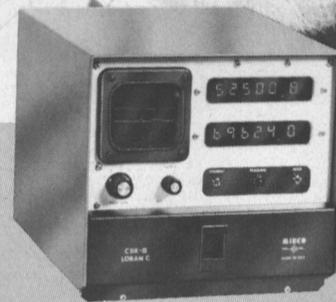
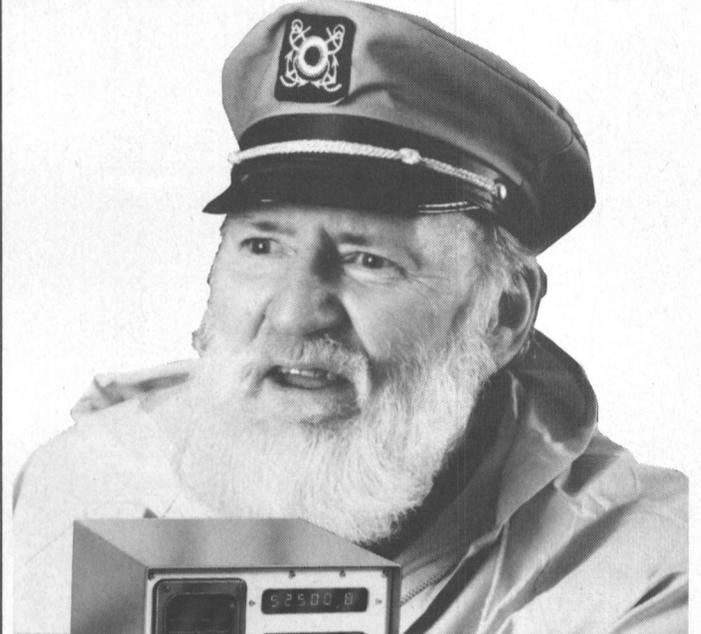
## Global Transport Offers New Brochure Describing Operations And Affiliates

A new capability brochure was recently produced by Global Transport Organisation, San Francisco, Calif., describing the firm's operations, resources and affiliates.

A specialist in international marine transportation, GTO is a joint venture uniting three prominent marine carriers—Crowley Maritime International, Federal Pacific Limited, and Genstar Overseas Limited. GTO is noted for trans-world moves of huge jackup drilling rigs, complete dredging fleets, modular plant components, pressure vessels, and other large or unusual cargo.

Interested companies can obtain copies of the new brochure by writing to **Warren Wheelock**, Global Transport Organisation, One Market Plaza, San Francisco, Calif. 94105.

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## Matson Asks Title XI To Build Containership

Matson Navigation Company, San Francisco, Calif., has applied for a Title XI guarantee to aid in the financing of one containership, to be named Kauai. The vessel will be 720 feet 5 inches in length, 34,700 displacement tons at 31-foot draft, and have a sustained sea speed of 23 knots at 29 feet 6 inches draft. It is designed to carry 911 twenty-four-foot containers, 174 forty-foot containers, and 36 twenty-seven-foot containers, including 302 refrigerated containers. There will be provision for additional 40-foot or 27-foot containers in lieu of 24-foot containers, and provision to carry about 2,400 long tons of molasses.

The applicant has indicated the vessel is intended for commercial use in foreign or domestic commerce, with its expected employment to be in service between California and Hawaii.

The Title XI guarantee would be for \$65 million, which represents 87½ percent of the estimated actual cost of the vessel. Sun Shipbuilding and Dry Dock Co., Chester, Pa., is the proposed shipbuilder.

## American Marine Applies For Title XI To Build Crewboats

American Marine Services, Inc., Lake Charles, La., has applied for a Title XI guarantee to aid in the financing of two crewboats. The guarantee would be for \$367,500, which represents 87½ percent of the estimated actual cost of the vessels. Dravo SteelShip Corporation, is the proposed shipbuilder.

## General Electric Gets \$50-Million Gas Turbine Contract For Navy Ships

Bath Iron Works has placed an order of \$50 million with General Electric for the company's LM-2500 marine gas turbines to power the U.S. Navy's Oliver Hazard Perry-Class guided missile frigates.

The contract was announced by O.R. Bonner, general manager, Marine and Industrial Projects Department, Evendale, Ohio.

The Perry Class has been proposed as a fleet in excess of 50 ships, all powered by the General Electric LM2500 gas turbines.

Each FFG-7 Class, 3,700-ton frigate utilizes two LM2500 gas turbines. Mr. Bonner states that the General Electric LM2500 engine is designed to provide low operating costs, long life, and high reliability.

The LM2500 has a 37 percent peak engine thermal efficiency, with a 21 to 27 percent lower fuel consumption rate than earlier generation powerplants. The LM-2500 also utilizes up to 45 percent

less airflow than gas turbines in the same horsepower class.

The high-pressure turbine operates at some 200 degrees centigrade higher than previous engines, yet with advanced air-cooling techniques, the turbine metals operate cooler than earlier uncooled engines. Longer metal life and improved gas cycle efficiency are the results.

Compared to GE's TF39 and CF6 aircraft engines, the LM2500

operates at 30 percent lower pressure and 110 degrees centigrade lower temperature. These lower operating parameters further improve parts life and maintenance costs.

The LM2500 was also selected by the U.S. Navy to power their 30 Spruance-Class destroyers and six Patrol Hydrofoil ships.

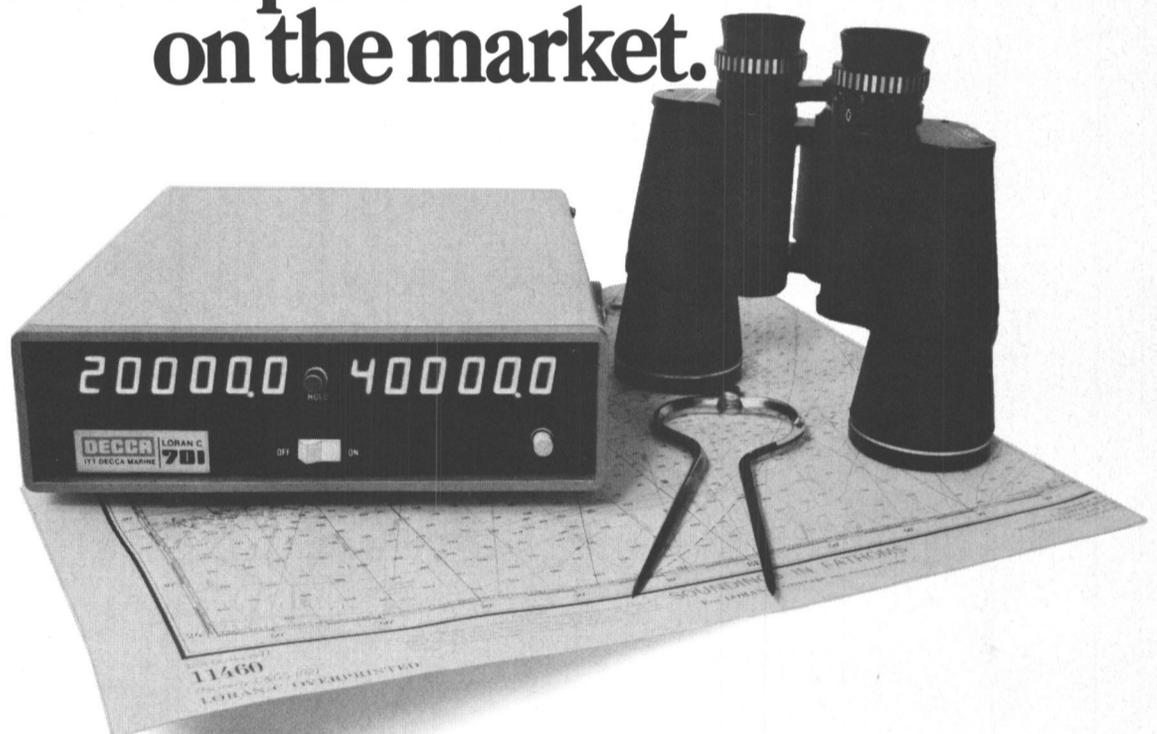
The LM2500 provides the propulsion for 118 ships in 11 navies around the world.

## James E. Smith Named Honorary Consul For Norway In New Orleans

James E. Smith, president of T. Smith & Son, stevedore contractors in New Orleans, La., has been named honorary consul for Norway in New Orleans.

Mr. Smith is also a director and vice chairman of the New Orleans Steamship Association.

# Presenting the smallest, easiest to operate Loran C receiver on the market.



You're looking at the ITT Decca Marine Model 701. Just turn it on (no complicated instructions, confusing dials or keyboards) and in a short time two bright digital displays will show you the Loran C coordinates of your position. Then all you have to do is pick off that position on your Loran C chart.

It gives you accurate position fixes day and night, in any weather, in your cruising area to better than ¼ mile in most cases, with repeatability of typically 50 feet (so you can continuously return to important locations).

Having two readings simultaneously is a feature recommended by the U.S. Coast Guard and eliminates the need to write down each coordinate. The 701 goes even further—and holds the readings as you pick off your position.

**The size?** Amazingly compact, 9.5" x 2.5" x 11.5" deep. So it fits into a small console, on a shelf or can be mounted overhead onto a bulkhead, and at 5.75 lbs, it's light enough to carry home between trips.

**Installation?** A cinch. It operates from 11 to 40 volts and uses less power than your running lights. No FCC license or registration is required, and if you plan an extended voyage, it can be pre-programmed for a new station's reception.

The ITT Decca Marine Model 708 for long distance navigational convenience. It has an added feature that allows you to manually



switch to other Loran C stations, as your craft makes its way along its charted course. In fact, it's the same equipment used by U.S.A. search and rescue vessels and it's only 2.5" higher than the 701.

Both units include *everything for full operation*: antenna, coupler, cables, receiver mounting bracket, and noise rejection filters (which can cost hundreds of dollars when purchased separately). You also have the security of a two year warranty on parts.

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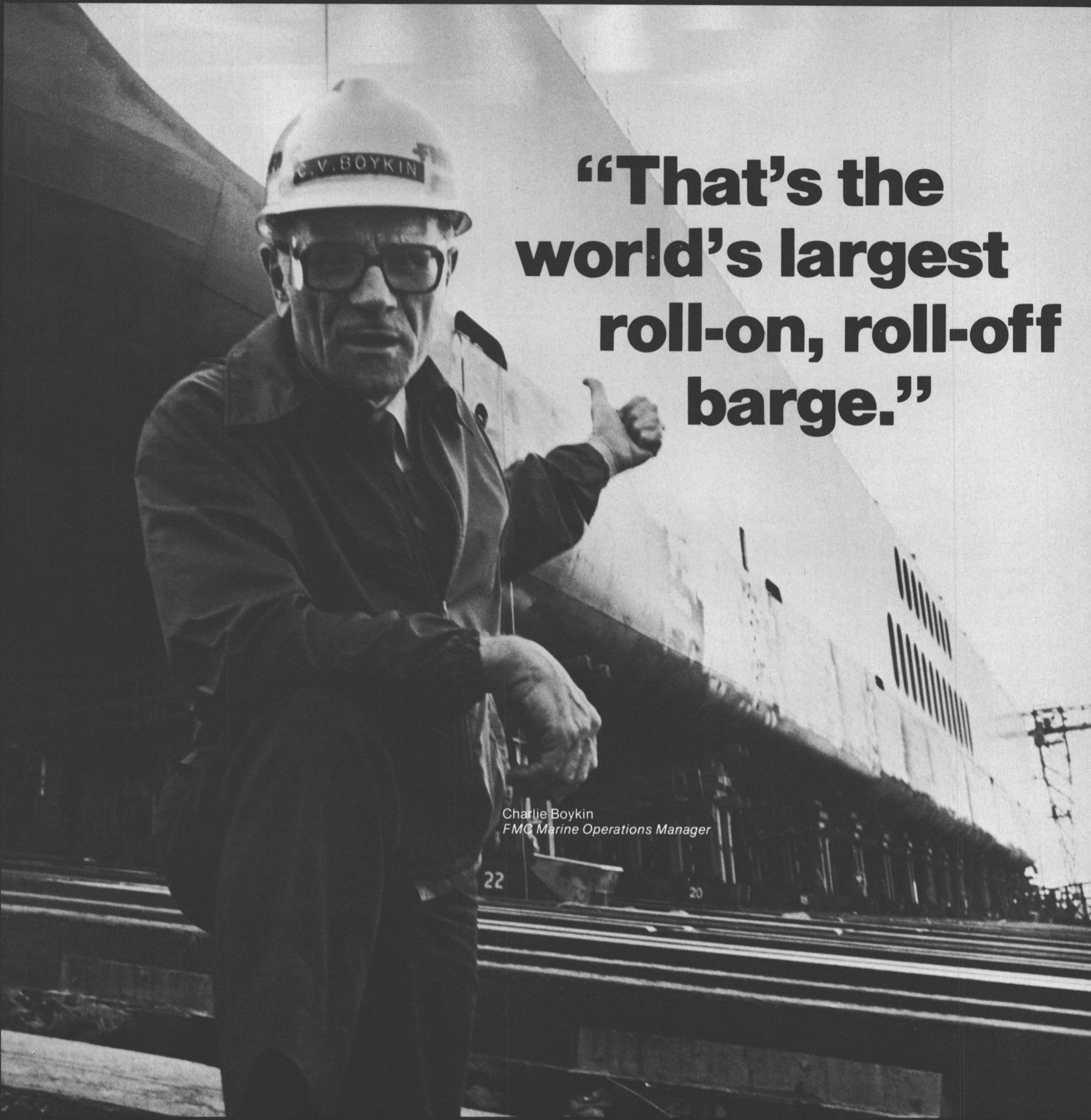
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Nobody had ever built what Crowley Maritime Corporation wanted: a triple-deck cargo barge, 580 feet long, 57 feet deep, with a beam of 105 feet. But Crowley knew FMC’s ways could serve them better, so FMC is building two of them for Trailer Marine Transport Corporation, a Crowley Company.

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FMC quality goes into everything we build. And if we can handle the world’s largest Ro-Ro barges, we can handle your particular job. See how FMC’s ways can serve you better. Call or write Vice President of Sales, FMC Corporation, Marine and Rail Equipment Division, 4700 NW Front Avenue, Portland, Oregon 97208. Telephone (503) 228-9281; Telex 36 0672; Telecopy (503) 223-5036.

**FMC**

## 1,000-Foot Bulk Carrier M/V Lewis Wilson Foy Joins Bethlehem Steel's Great Lakes Fleet



Pictured at the recent christening of Bethlehem Steel's M/V Lewis Wilson Foy are, left to right: Mrs. Arthur J. Zuehke; Mr. Zuehke, president, Bay Shipbuilding Corp.; Mrs. Lewis W. Foy; Mr. Foy, chairman/chief executive officer, Bethlehem Steel Corp.; Mrs. John D. West, and Mr. West, president, The Manitowoc Company.

The newest 1,000-foot vessel on the Great Lakes, Bethlehem Steel Corporation's M/V Lewis Wilson Foy was recently placed in service. Designed and constructed by Bay Shipbuilding Corp., Sturgeon Bay, Wis. 54235, a subsidiary of The Manitowoc Company, Inc., the Foy is the second 1,000-foot bulk carrier delivered by Bay Shipbuilding, the first being American Steamship Company's M/V Belle River.

The ship was christened by Mrs. Lewis Wilson Foy, wife of the chairman/chief executive officer of Bethlehem Steel Corporation, after whom the vessel was named. Mrs. F. Arnold Heller and Mrs. Joseph W. Karaman, daughters of Mr. and Mrs. Foy, acted as matrons-of-honor. Mr. Foy was principal speaker at the christening, which was attended by the top officials of the participating companies, officers of the U.S. Coast Guard, American Bureau of Shipping representatives, and other invited guests.

The Foy, whose keel was laid on October 8, 1976, and was launched on April 8, 1977, made her maiden voyage on June 8, 1978. The vessel will haul pelletized iron ore between the upper Lakes ports of Taconite Harbor, Minn., and Superior, Wis., and Bethlehem's steel plants at Burns Harbor, Ind., and Lackawanna, N.Y.

The Lewis Wilson Foy is the seventh vessel in Bethlehem Steel Corporation's Great Lakes Steamship Division. The vessel, which has a 105-foot width, 56-foot depth and an operating draft of 27½ feet, has a deadweight tonnage of 68,880 short tons. Although specifically intended to carry pelletized ore, it is also well suited to handle other free-flowing bulk cargoes such as coal,

limestone or wheat. The vessel is fitted with self-unloading equipment consisting of a 114-inch-wide hold-loop belt conveyor and a 250-foot boom conveyor, all complete with idlers, electric-drive mechanisms of 3,150 horsepower, hoist and swing mechanism and cargo hold gates. It is capable of discharging 10,000 short tons of coal or 10,000 long tons of iron ore pellets per hour.

The propulsion machinery is located aft and consists of four 3,500-shaft-horsepower diesel engines and two reduction gears driving two controllable-pitch propellers at approximately 120 rpm for a total of 14,000 horsepower and a speed of 16 mph. The plant is arranged so that one engine can drive each propeller shaft continuously at a reduced load. The system's design includes bridge control, and is suitable for operation with machinery surveillance by only one person on watch in the engine room. A central control station is located in an air-conditioned and noise-proof control room in the engine room with necessary remote controls and monitoring and alarm devices.

Two generators of 2,500-kw, 4,160-volt, 3-phase, 60-cycle, a-c, are driven one each by the outboard propulsion engines. Either generator can furnish all power required for either the 3,150-hp unloading machinery or the bow and stern thrusters of 1,500 hp each, and the other generator serves as a standby. Two ship's service diesel-driven generator sets, each 600-kw, 480-volt, 3-phase, 60-cycle, a-c, are installed to furnish power for ship's services.

The crew is housed in quarters located in the deckhouse at the after end of the vessel. All rooms have private baths, and the entire

crew space, including the pilot-house and galley is air-conditioned.

The hull is built of higher strength steel which has a yield point of 51,000 pounds per square inch, and the use of this steel saves about 15 percent in the weight of the hull, as compared to ordinary strength hull steel.

## Gastech 78 LNG/LPG Conference Includes Major Paper From OPEC

The program has been announced for the Gastech 78 LNG and LPG meeting which will be held in the new Monte-Carlo Convention Centre from November 7-10 this year. It will be the sixth in the series.

Leading the program will be a paper of great significance from OPEC—the Organization of the Petroleum Exporting Countries—to be given by **Abderrezak Ferroukhi** (head of the International Economics Section) who will speak on a pricing policy for OPEC LPG. Although OPEC's petroleum pricing activities have been very much in the public eye ever since the round of price increases started in 1974, which led to a quadrupling of crude oil prices, the Gastech 78 meeting will be the first public platform for the announcement of OPEC's next aim—price fixing for LPG and LNG. With LPG and LNG increasingly sought after as a replacement for oil imports—particularly in such pollution-conscious areas as Japan and the U.S. West Coast—there is no doubting the considerable significance of OPEC's new move.

• The Gastech 78 meeting will also bring together a panel from most of the world's leading LPG producers—including government and industry speakers from Abu Dhabi, Saudi Arabia, Kuwait, Qatar, Algeria and Venezuela.

• Presentations and discussions from the gas producers' panel will be followed by a panel from some of the main gas marketers—Mundogas, Bridgestone, Northern Natural Gas, etc.

• Speakers from Shell International Gas and Ocean Phoenix will survey the international base-load LNG trade for the period 1978-90.

• The potential for LNG exports from Australia's Northwest Shelf will be described by **Robert J. Foster** of Broken Hill Pty.

• A Canadian panel, including Petro-Canada's **W. Sidjak** and **Michael Bell** of Melville Shipping, will discuss the ambitious Arctic Pilot Project designed to open up the vast potential of the Canadian Arctic.

• The U.S.A. remains the world's largest gas consumer, and increasingly needs supplies of imported gas. The Institute of Gas Technology's **Philip J. Anderson** will spell out the facts on

America's LNG trade potential, and **David J. Bardin**, administrator of the Economic Regulatory Administration, will give Washington's official view on U.S. LNG import policy.

• Progressing the safety debates of previous Gastech meetings, this year's program will include papers from the U.S. Coast Guard—discussing their new rules based on the IMCO Gas Carrier Code. Essochem, Pullman Kellogg, and the Norwegian classification society Det norske Veritas will also make presentations on safety and reliability programs.

• Offshore development of gas fields will be covered from various angles, including floating LNG production facilities. Speakers from organizations active in Germany, France, Britain and the U.S.A. will present the results of their latest researches into this sector of the gas industry.

• In addition to the plenary sessions in the main auditorium of the new Monte-Carlo Convention Centre, various technical developments will be unveiled in specialist workshop sessions.

• Gastech 78 will close with a panel debate on the future of the liquefied gas business by a number of specialists—**Alexis Pastuhov, J.J. Cuneo** of Energy Transportation, **H. van Engelshoven**, Shell's Natural Gas coordinator, and P & O's **Pat Mitchell**.

The Gastech Week in Monte-Carlo will also feature the world's largest exhibition of LNG and LPG technology, equipment, and services. More than 120 international exhibitors will occupy stands in the Monte-Carlo Convention Centre, Loews Monte-Carlo Hotel, and the nearby Hall du Centenaire. Admission to the exhibition is free of charge to accredited industry personnel.

For fuller details of the conference program and registration particulars, contact the organizers: Gastech 78, 2, Station Road, Rickmansworth, Herts WD 3 1QP, England.

## Jeffboat Receives Tank And Mooring Barge Contracts

Jeffboat, Inc., Jeffersonville, Ind., has announced the sale of two semi-integrated double-skin tank barges to the Parker Towing Company of Tuscaloosa, Ala. The barges will be built to standard Jeffboat designs, and will be delivered in November 1978.

Jeffboat has also been awarded the contract to build a 400-foot mooring barge for the U.S. Army Corps of Engineers. Intended for use in the Vicksburg, Miss., District, the huge barge is actually two 200-foot barges bolted together. It will be launched and transferred in its bolted state. Sale price from public bid was \$3,750,000.

## Admiral Synnot Compliments Todd Shipyards At Launching Of Frigate For Australian Navy

The HMAS Adelaide, the first of three guided missile frigates to be built for the Australian Government, was recently launched at Todd Pacific Shipyards Corporation Seattle (Wash.) Division. Five others of the same design are being built at Todd-Seattle for the United States Navy.

The principal speaker for the launch ceremonies was Vice Adm. **Anthony M. Synnot**, Chief of Naval Staff, for the Royal Australian Navy.

Mrs. **Elizabeth Anne Synnot**, wife of Admiral Synnot, christened the ship, accompanied by her matron-of-honor, Mrs. **Jocelyn Loosli**, wife of Commodore R. **Geoffrey Loosli**,

Australian Naval Attache at the Australian Embassy. Miss **Leesa Garbutt**, daughter of Mr. **John M. Garbutt**, Deputy FFG Program Manager, served as flower girl to the launching party.

Admiral **Synnot** complimented Todd Pacific Shipyards Corporation, Seattle Division, for the skilled workmanship and innovative and competent management which has produced the HMAS Adelaide. Admiral **Synnot** also noted that Todd Pacific Shipyards Corporation has been able to launch the HMAS Adelaide one month ahead of schedule.

Admiral **Synnot** commented on Australian involvement in the FFG program which began in 1973 when Australia was examining options for new destroyers. The Memorandum of Arrangement signed by the United States Government and the Australian Government in 1974 has subsequently

led to a unique arrangement whereby Australian officers have been "totally integrated into the U.S. Navy (FFG) Program Office, to work on the overall acquisition program of FFGs."

Admiral **Synnot** also stressed the important features of the FFG-7 class ship—in particular, the minimum manning concept. This concept was most prominent in the minds of the Australian Defence Department when they were selecting the most suitable ship to "meet Australia's needs in years ahead, because manpower is expensive as is the lengthy and demanding training required to prepare crews to serve on such ships."

Admiral **Synnot** went on to note that the advanced technology of the FFG-7 class ship included gas turbine propulsion driving a single large propeller with variable-pitch, centralized machinery control in a remote position, a totally integrated weapons system heretofore unrealized in other ships, and two helicopters which will "be the eyes of the ship to provide the over horizon information needed to find, identify and direct long-range weapons to their targets."

The frigates are multipurpose combatants of 3,600 tons displacement, 445 feet in length, with gas turbine propulsion of 40,000 horsepower transmitted through a single shaft and variable-pitch propeller system. The ships are outfitted with guns, missiles, torpedoes, and antisubmarine helicopters, and are capable of 28-knot speeds. The HMAS Adelaide is designed for a complement of 176 officers and men.

Keel-laying for the HMAS Adelaide occurred in late July 1977, with the placement of a 35-ton hull section. In the brief span of 11 months, hull sections were fabricated and joined together to form a structurally complete steel hull and aluminum superstructure, ready for launch and outfitting.

Other speakers at the event included **Arthur W. Stout Jr.**, president, Todd Shipyards Corporation; **Sir David L. Nicolson**, member of the board of directors, Todd Shipyards Corporation and chairman of Rothmans International, Limited, London, England; the Honorable **T.M. Casey**, Member of the Legislative Council of the South Australian Parliament and Minister of Tourism, Recreation and Sports, who represented and extended special greetings from the City of Adelaide; **Eugene Hintz**, International Representative of the International Association of Sheet Metal Workers; **Capt. S.P. Pasantino**, Supervisor of Shipbuilding, Conversion, and Repair, Thirteenth Naval District; and **Vice Adm. C.R. Bryan**, Commander, Naval Sea Systems Command, Washington, D.C.

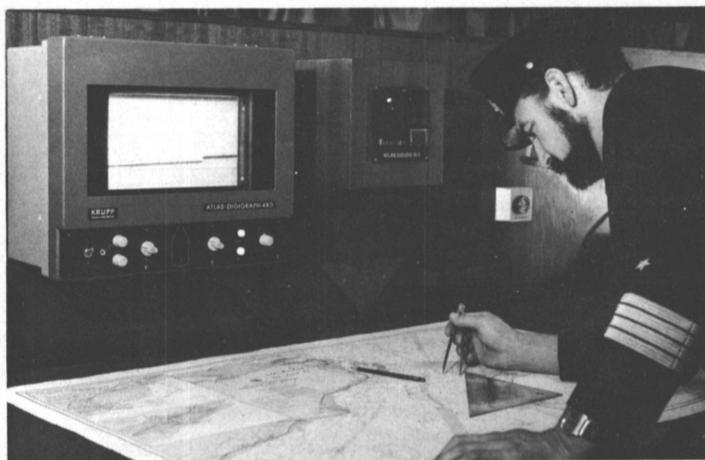
## Morania Asks Title XI For Asphalt Carrier

Morania Barge No. 410, Inc., 136 East 57th Street, New York, N.Y., an affiliate of Morania Oil Tanker Corp., has applied for a Title XI guarantee to aid in financing the construction of a bulk oil barge. The applicant indicated the barge, which would not be self-propelled, would be used to carry asphalt from New York to Jacksonville, Fla., Savannah, Ga., Wilmington, N.C., or Baltimore, Md.

S.B.A. Shipyards, Inc., Jennings, La., is the proposed builder of the vessel.

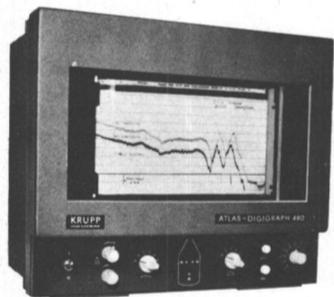
The Title XI guarantee would be for approximately \$2,500,000, which represents 87½ percent of the estimated actual cost of the barge.

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# ATLAS DIGIGRAPH 480 ATLAS 460



ATLAS 480



ATLAS 460

Both the ATLAS DIGIGRAPH 480 and the ATLAS 460 comply with the U.S. Coast Guard rule effective June 1, 1977 requiring all vessels of 1600 gross tons or more operating on the navigable waters of the U.S. to be equipped with 'an echo depth sounding device, a device that can continuously record the depth readings of the vessel's echo depth sounding device'.

The Atlas navigation sounders ATLAS DIGIGRAPH 480 and ATLAS 460 fulfill this USCG requirement, and in addition comply with all IMCO recommendations.

The ATLAS DIGIGRAPH 480 offers a unique range selection from 5 fms for shallow navigation and berthing, to 500 fms for deep water navigation. Operating ranges can be converted from fathoms to meters merely by pushing a button. On shallow ranges, bottom soundings from two transducers can be recorded simultaneously — (up to four transducers can be monitored in groups of two). The selected range and the bottom recording are digitally displayed, and an automatic 15 minute time mark and event marker features are included. Optional plug-in type transducers can be supplied for replacement without dry docking.

The ATLAS 460 offers the same rugged reliability as the more sophisticated DIGIGRAPH 480. The ATLAS 460's three ranges are switchable from fathoms to meters. Maximum depth is 500 fathoms (1000 meters), and the shallow water range is 0-25 fms with a minimum sounding depth of approximately 0.3 fathoms. An event marker is included. Operation with two transducers, switchable at choice, is optional. Plug-in transducers are available.

Both recorders can be fitted with remote digital readouts — ATLAS FILIA 520, and an alarm unit ATLAS ALARM 525.



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**YES!** I WOULD LIKE MORE INFORMATION PLEASE!

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TYPE OF VESSEL(S) \_\_\_\_\_



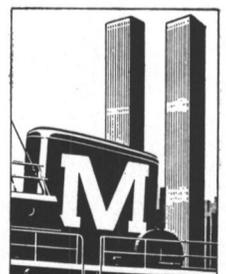
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## Crowley Orders Two Additional Triple-Deck Barges From FMC

Crowley Maritime Corp. has ordered construction of two additional 580-foot, triple-deck barges for the Caribbean roll-on/roll-off service operated by its subsidiary, Trailer Marine Transport Corp. Carrying up to 374 forty-foot

trailers each, the new barges will be identical to Crowley's La Reina which completed its maiden voyage in the Caribbean last May. A second triple-deck barge, El Conquistador, is already under construction at the Marine and Rail Equipment Division of FMC Corp. in Portland, Ore., and will be delivered to TMT in the fall.

Work on the two additional barges is expected to get under-

way in September, with delivery of the first scheduled for summer 1979. The second will be delivered by the end of 1979.

The La Reina and five double-decked barges are now used by TMT to provide roll-on/roll-off service from Jacksonville, Miami and Lake Charles to Puerto Rico, the Virgin Islands, the Leeward and Windward Islands, Venezuela, and the Dominican Republic.

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## International Paint Names Robert Hartley

Robert A. Hartley has been named senior vice president, Technical, North America, by the International Paint Company, Inc. (USA) and International Paints (Canada) Limited.



Robert A. Hartley

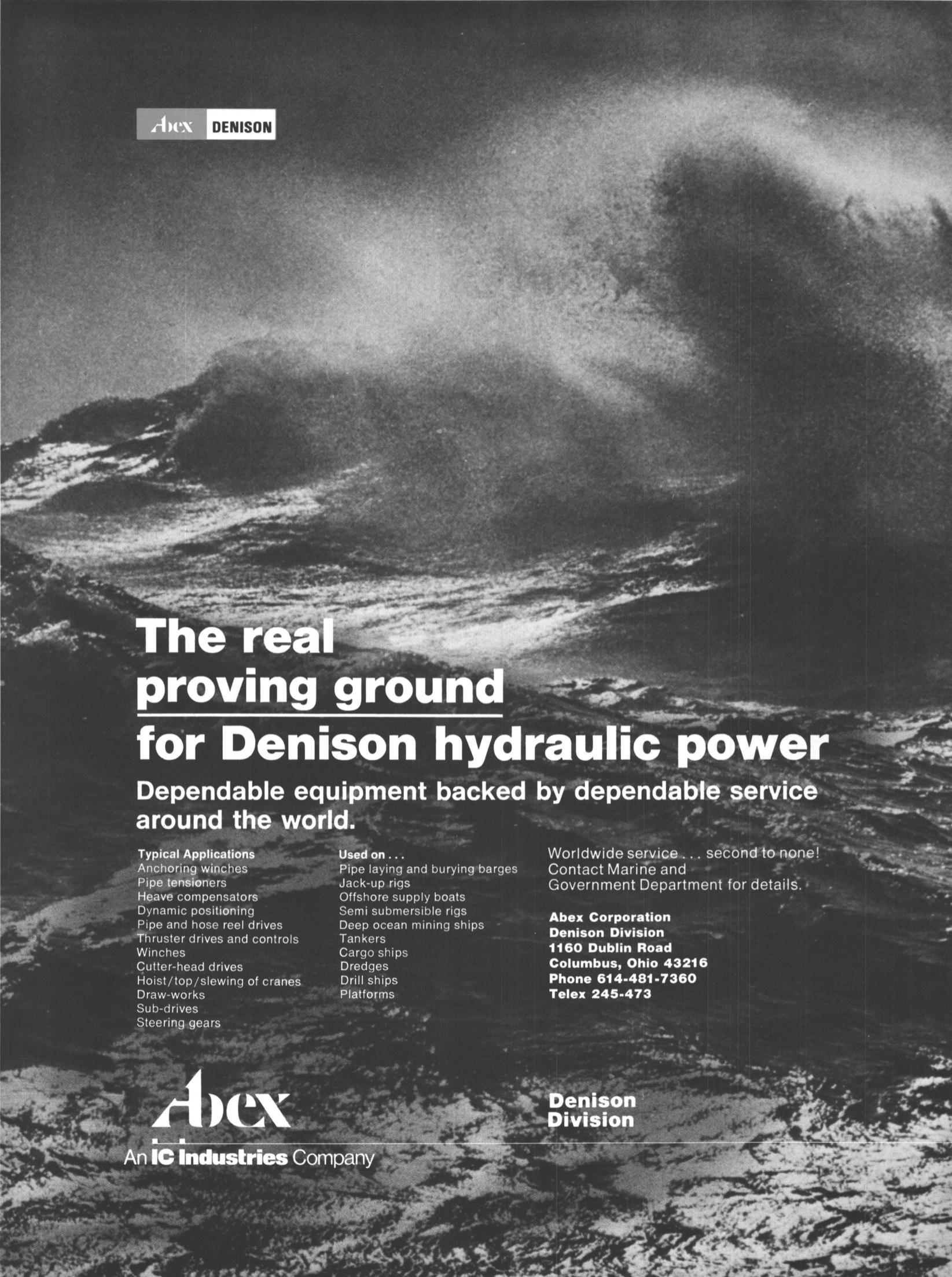
Mr. Hartley will head up the North American Group Laboratories soon to be completed at the Union, N.J., facility of International Paint. This fully staffed and equipped technical setup will consolidate the product development activities in one place for the entire North American market, including the U.S., Canada and Mexico. Communication and information exchange with other International Paint technical facilities around the world will be enhanced.

Mr. Hartley is a native of England and holds a degree in chemistry from the University of London. He has held various technical positions in International Paint for over 20 years and has traveled extensively in North America and around the world. He is a member of The Royal Institute of Chemistry, The National Association of Corrosion Engineers, A. S. T. M., and The Society of Paint Technology.

## Contract Awarded To Design SALM System

Ocean Resources Engineering, Inc., 2060 North Loop West, Houston, Texas 77018, has been awarded a contract by Exxon Production Research Company for the final structural and mechanical design of a SALM (Single Anchor Leg Mooring) System for Shell U.K. Exploration and Production (Operator), and for Esso Exploration and Production U.K. for the Fulmar Field in the North Sea. The facility will accommodate a nominal 200,000-dwt storage tanker, which will remain permanently moored in a water depth of 270 feet.

Harry J. Sweet & Associates and H.O. Mohr & Associates will support Ocean Resources Engineering with finite element analyses and with special design of mechanical components. The design effort will be accomplished in Houston under the oversight of Exxon Production Research Company, and will be ready for construction bidding this winter.



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For more information, call Gerry Gutman, Al Carlson, or Jack Provenzano.

*This announcement appears as a matter of record only.*

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affiliate of

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Waterman Industries Corporation**

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Payment of principal and interest is guaranteed by the  
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*The undersigned has underwritten and publicly offered the above Bonds.*

**Merrill Lynch White Weld Capital Markets Group**  
Merrill Lynch, Pierce, Fenner & Smith Incorporated

June 9, 1978

### Use Of Helicopter To Install 18 Tank Cleaning Machines Saves Operator \$37,000 And Time

How can 18 tank cleaning machines for crude oil washing be permanently retrofitted onboard a 101,500-dwt ore/bulk/oil carrier when its decks have too many hatches to use sheerlegs and the sea is too rough to use a floating crane?

The superintendent of a six-year-old Great Eastern Shipping Ltd. vessel, the Jag Laadki, was faced with just that problem, and solved it. What's more, an unprecedented \$37,000 and nearly 2½ days were saved in the process.

It began when the operators of Great Eastern decided that the Jag Laadki—already equipped with an inert gas system—could provide additional operating efficiencies by switching from water to crude oil washing (COW).

They selected the LAVOMATIC® (SA) tank cleaning machine manufactured by Butterworth Systems Inc., because of its highly efficient use of crude oil as a washing medium. By means of a cam-operated, variable-pitch impeller, the LAVOMATIC (SA) unit can be adjusted to slow its rotational speed when washing critical areas such as tank bottoms, and to increase its speed when washing noncritical areas such as tank sides and tops. This speed programming feature can result in up to 60 percent reduction of both cleaning time and wash fluid used.

Heavy seas and winds up to 30 knots prevailed as the Jag Laadki sailed into Baltimore, Md., and docked alongside a long, narrow jetty to take onboard the 18 LAVOMATIC SA machines delivered by Butterworth Systems. The rough weather ruled out the immediate use of a floating crane for the installation of these machines, while the complex hatch work on the Jag Laadki made it impossible to use sheerlegs.

Faced with substantial losses due to expensive ship downtime, Captain **Shah** came up with an innovative method for raising and positioning the LAVOMATIC SA machines. He chartered a local helicopter.

With the 18 LAVOMATIC SA machines lashed amidship, the Jag Laadki proceeded to the mouth of the Delaware River and a rendezvous with the helicopter. There, a high-risk complication was discovered. The vessel's inert gas system was malfunctioning, and her tanks were filled with a potentially explosive atmosphere. Ever resourceful, Captain **Shah** ordered all tanks flooded with seawater to eliminate any chance of explosion.

The helicopter was able to land on the Jag Laadki, where the pilot reviewed the installation plans with Captain **Shah** and the crew.

One at a time, the helicopter swiftly lifted each LAVOMATIC SA tank cleaning machine from the deck of the Jag Laadki, positioned it over the designated hatch opening, and lowered it precisely on target. The on-deck installation crew carefully guided each machine into place where it was permanently secured.

Captain **Shah's** innovative decision to use a helicopter to install this equipment resulted in considerable savings for the Great Eastern Shipping Company. Expensive ship downtime was avoided, and actual installation time and cost were greatly reduced. A look at the bottom line verifies this.

A floating crane would have completed the installation in three days at a cost of \$40,000. Using the helicopter took only 13 hours—12 for ballasting and deballasting, and only 1 hour for the helicopter installation. The actual cost was only \$3,000. Hence, a saving of \$37,000 in installation costs alone.

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**TYPE 1507** — For cargo pumps and other *heavy duty* marine applications.



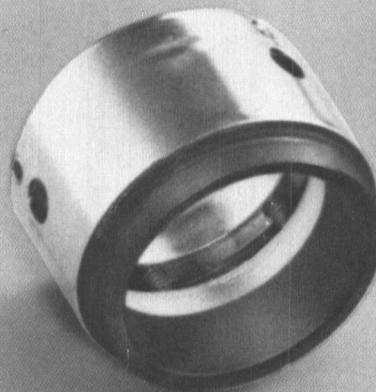
**TYPE 670** — Good for broad range of applications aboard ship. This *welded metal bellows* seal will fit most existing cavities. All Hastelloy C construction for maximum corrosive resistance.



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**U.S. And Canadian Banks Lend \$50 Million To Argentine Shipping Firm**

The Bank of Boston and the Bank of Montreal will lend \$50 million to Argentina's state-owned shipping firm, financing the company's building projects through the end of 1978. The loan will be repayable over seven years.

The two banks are members of a syndicate of international financial institutions created to provide

funds to Empresa Lineas Maritimas Argentina (ELMA).

In all, 28 ships are being built in Argentine and foreign shipyards. Two new freighters, just delivered from yards in Spain and Scotland, bring ELMA's fleet up to 52 vessels, totaling 638,775 tons. Eight more ships will be delivered shortly.

The Tucuman, from Scotland, can transport general, bulk, liquid refrigerated and container cargo. The 14,930-ton vessel,

which is 455 feet long and has a speed of 15.5 knots, will ply the Pacific routes.

The Chaco, from Spain, will carry the same cargo, except for refrigerated goods. The single-screw motor vessel is 517 feet long, has a speed of 15.5 knots, and will travel the northern European routes.

The Argentine merchant fleet is adding new routes to existing ones, particularly to some African states.

**Dr. Wilkins Joins CDI Marine Company**

Paul I. Beining, president of CDI Marine Company, recently announced that Dr. James R. Wilkins Jr. has joined the staff of CDI Marine Company, in the newly established position of chief engineer. Dr. Wilkins is responsible for technical efforts of CDI Marine offices, under CDI Marine's vice president James M. Dunford.



Dr. James R. Wilkins Jr.

Dr. Wilkins graduated from the U.S. Naval Academy in 1950, received a Master of Science degree in naval architecture from Webb Institute of Naval Architecture in July 1956, and later was awarded the degree of Doctor of Engineering, following studies and research at the University of California at Berkeley.

Dr. Wilkins served more than 27 years in successively more responsible positions in U.S. Navy ship design, acquisition, construction, overhaul and repair program. Notably, as the Ship Acquisition Project Manager (SHAPM) of the NATO PHM Project, Dr. Wilkins was involved from the initial stages of development in satisfying the needs of the participating NATO Countries (U.S., Germany and Italy) through the design, specification development and building of a U.S. Navy prototype hydrofoil craft, the USS Pegasus (PHM-1). This craft is currently in service in the U.S. Navy, and a construction contract has been let for five more of these impressively effective ships.

Dr. Wilkins's successful Naval career culminated with his assignment as head of the Naval Ship Engineering Center's Ship Systems Design and Engineering Department, having previously served as the head of the Ship Design Division and Hull Division. As such, his experience is eminently suited to the technical areas in which CDI Marine is working.

CDI Marine Company is a major supplier of naval architectural and marine engineering services to shipyards, both commercial and Navy, and to their supporting industries. Principal offices are located in Jacksonville, Fla., Norfolk, Va., Philadelphia, Pa., and San Diego, Calif. Each is permanently staffed with naval architects, marine engineers, designers and draftsmen.

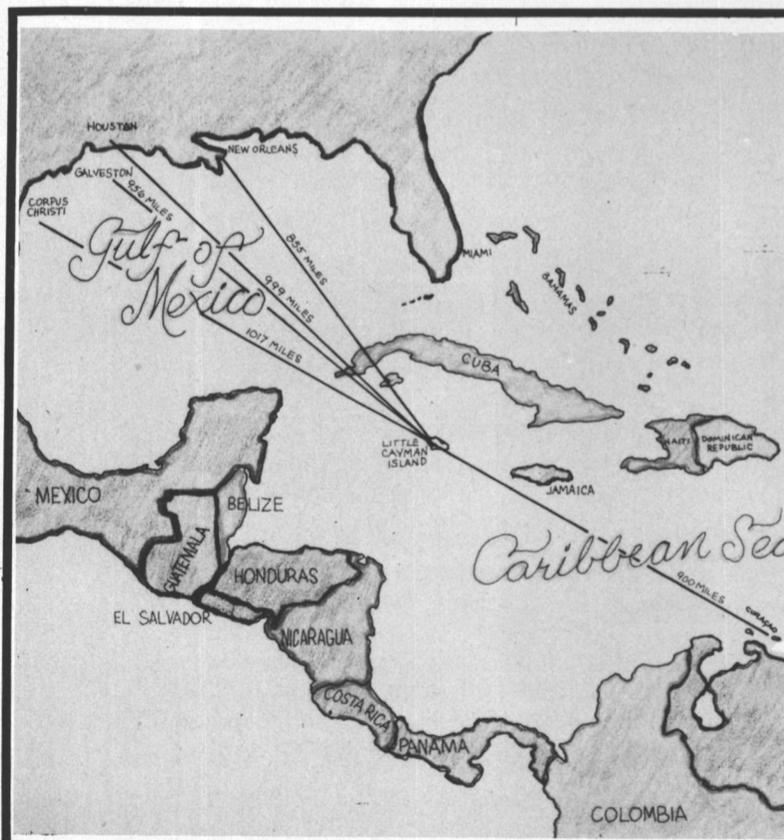
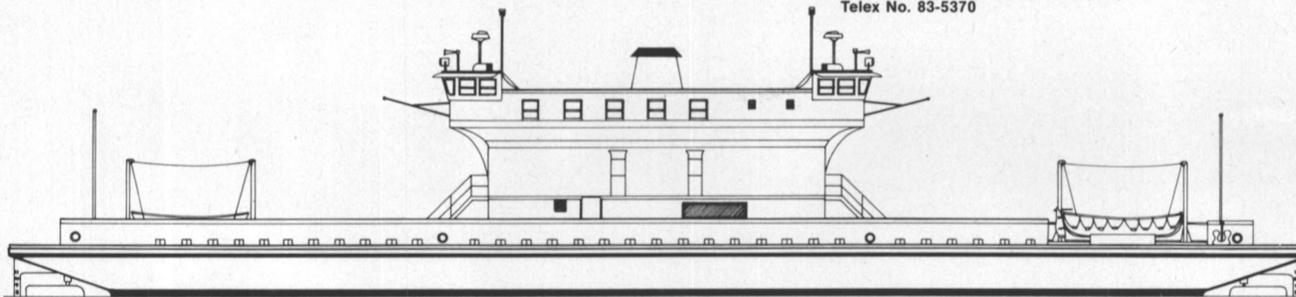
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## Alco Power Names Neil H. Whitehead

Neil H. Whitehead has been appointed sales engineer for the mid-continent region by Alco Power Inc. of Auburn, N.Y.



Neil H. Whitehead

In his new position, Mr. Whitehead will be responsible for the sales and service of Alco POWER BOSS diesel engines and parts in the riverboat and industrial diesel markets. Reporting directly to Ray Cathcart, regional manager, Mr. Whitehead will also work closely with the Alco distributor network effecting complete factory liaison.

The new sales engineer comes to Alco with a wealth of experience, particularly with the waterway industry. This experience dates back to 1953 and includes sales of petroleum products, maintenance articles and bow thrusters for inland waterways vessels, oceangoing vessels, and exploration and drilling equipment.

He is the national vice president of The Propeller Club (third time), and has been on the operating board-Str. Belle of Louisville since 1962.

Alco is a leading manufacturer of diesel engines used for marine propulsion, standby electric power generation, onshore and offshore oil exploration, pumping and locomotive applications.

## Lube Oil Pump Power For Emergency

The Galbraith-Pilot Marine Division of Marine Electric RPD, Inc., 166 National Road, Edison, N.J., has introduced a lube Oil Pump Emergency Power Source to assure protection of ship propulsion machinery after a power interruption.

The emergency power source is an "uninterruptible" power system which goes on immediately after a power interruption, thus assuring a constant flow of lubrication oil for at least 10 minutes, during which time normal power can be restored.

In the past, most shipboard emergency lube oil pumping systems have relied on stored air pressure tanks to drive a pneumatically powered pump for the "wind down" period. However, the need for reliability and repeatability (air pressure tanks must be replaced or repressurized) has given emergence to

stored electrical power as a better approach.

The unit consists of a battery, battery charger and a reduced voltage motor controller assembled in a single metal enclosure suitable for deck mounting. The enclosure is steel construction suitably braced to provide a free-standing structure with mounting angle for bolting. Two compartments are completely isolated

from each other, one compartment for housing the battery and the other compartment for housing the battery charger and the reduced voltage motor controller.

The Galbraith-Pilot Lube Oil Pump Emergency Power Source is fully rejuvenated within eight hours after main a-c power is restored. A battery charger maintains the 120-v d-c battery pack

at full charge, ready to deliver a full 39 amps for up to 10 minutes to the d-c pump motor, 5 hp, 900 rpm.

Complete details of the Galbraith-Pilot Marine Lube Oil Emergency Power Source can be obtained by writing to Robert Stern, Galbraith-Pilot Marine Division, Marine Electric RPD, Inc., 166 National Road, Edison, N.J. 08817.

# Now you can have a 'Telex at Sea' communication system for under \$30,000.\*

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The system enables you to transmit and reliably receive long lists of figures and tables, provisioning, maintenance, administrative data and correspondence—automatically, even without a radio officer on watch. A method of error-detection and error-correction assures the accuracy of each character, of each word.

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In a cooperative spirit between two world leaders in maritime communications—Communication Associates, Inc. and North American Philips Corporation, Communication Systems Division—a stand alone, fully integrated 'Telex at Sea' HF System, capable of operating on SSB, teleprinter, C.W. and other optional special purpose emissions has been developed. It interfaces CAI's high performance CA-35 MS/MKII SSB system with a PHILIPS STB 750 Simplex TOR. It's the integration of two systems that have both proven their reliability aboard hundreds and hundreds of vessels.

The frequency synthesized CA-35 MS/MKII can be programmed for any of the HF marine frequencies, regardless of changes. It is on frequency instantly with 1/2 part per million stability, and has a 1,000 watt antenna coupler, both with two-stage tuning. The PHILIPS-pioneered Simplex Teleprinting Over Radio error

eliminator is narrow-band direct printing radiotelegraphy of a high order. It offers Automatic Request for Repetition (ARQ), Forward Error Correction (FEC), and Unprotected (RTTY) modes of operation. The system provides error detection, error correction, and excellent protection against fading, noise, or other distorting interferences. It turns any ship's radio room into a highly dependable Telex terminal and 'electronic post office.' Installation is as simple as installing an SSB radio.

The system comes packaged within two compact cabinets, along with your choice of teleprinter. Its unattended and automatic capabilities make the data explosion manageable.

For complete technical information on the 'Telex at Sea' system, write: Communication Associates, Inc., 200 McKay Rd., Huntington Station, NY 11746.



World leader in  
SSB communications.



## OCEANS 78 To Feature Public Policy Issues

Discussions and debates on five critical oceans issues will be featured at OCEANS 78, fourth annual combined conference sponsored by the Marine Technology Society and the Institute of Electrical and Electronic Engineers. The conference will be held September 6-8, 1978 at the Sheraton-Park Hotel, Washington, D.C.

The Public Policy Program is an innovation sparked by **Richard A. Frank**, chairman of the conference and Administrator of the National Oceanic and Atmospheric Administration, U.S. Department of Commerce. Added to what has heretofore been primarily a technical conference, the 2½ to 3-hour discussions will focus on actual and potential policy in the United States. They will run concurrently with the technical sessions.

The five policy subjects are: outer continental shelf oil and gas; coastal zone management and ocean use; fisheries policy; ocean mining; and oceans research and development.

Format for the policy sessions will consist of speakers presenting differing viewpoints, followed by a panel discussion and questions or arguments from the audience.

The technical sessions that make up the largest part of the

conference will this year include financing ocean development, deepsea mining, development of ocean energy and related environmental issues, ocean pollution, underwater vehicles and work systems, and state-of-the-art instruments and hardware.

Approximately 150 papers will be presented from scientists and engineers at universities, laboratories and private industry throughout North America and from abroad.

An introductory panel presentation will open OCEANS 78 to discuss benefits and problems associated with Government-industry cooperation in ocean development. Cooperative ventures, regulatory activity, and governmental assistance will be discussed.

The Public Policy Program is being arranged by **Heather L. Ross**, Assistant Secretary for Policy, Budget and Administration of the U.S. Department of the Interior. The Technical Program is being arranged by **Anthony I. Eller** of the Naval Research Laboratory.

Participating organizations in OCEANS 78 include the American Association for the Advancement of Science, American Institute of Aeronautics and Astronautics, American Oceanic Organization, American Society of Mechanical Engineers, American Society of Naval Engineers, National Association of Corrosion Engineers, Sea Grant Association, and The Society of Naval Architects and Marine Engineers.

## Seatrains Subsidiaries

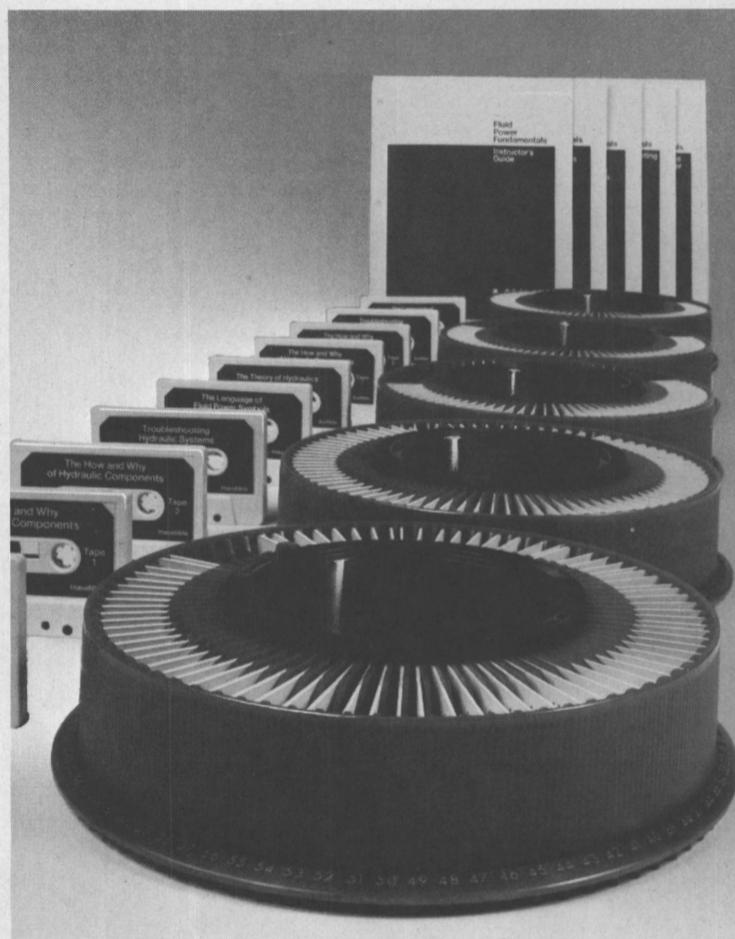
### Apply For Title XI To Build Tank Barges

Three wholly owned subsidiaries of Seatrain Lines, Inc. have applied for Title XI guarantees to aid in the financing of one tank barge each. The applicants are Bedloes Shipping Co., Inc., Governors Shipping Co., Inc., and Liberty Shipping Co., all of One Chase Manhattan Plaza, New York, N.Y.

Each barge will have a capacity of 32,000 deadweight tons, with a draft of 39 feet, overall length of 594 feet, and beam of 95 feet. Each will be capable of carrying four grades of liquid cargo. Tanks are to be coated, and the barges will have the capability of heating the cargo.

The applicants indicated the barges are intended to be operated in the domestic coastwise trade, and are primarily intended to be used in the carriage of bulk oil products. The applicants propose chartering the barges to an affiliated company.

The Title XI guarantee requested by each applicant is \$15,400,000, which represents 87½ percent of the estimated actual cost of each barge. Seatrain Shipbuilding Corporation is the proposed builder for all the barges.



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Our Hydraulic Training program is put together by experts in industrial training and is proven educationally effective. Effective training can save you money by:

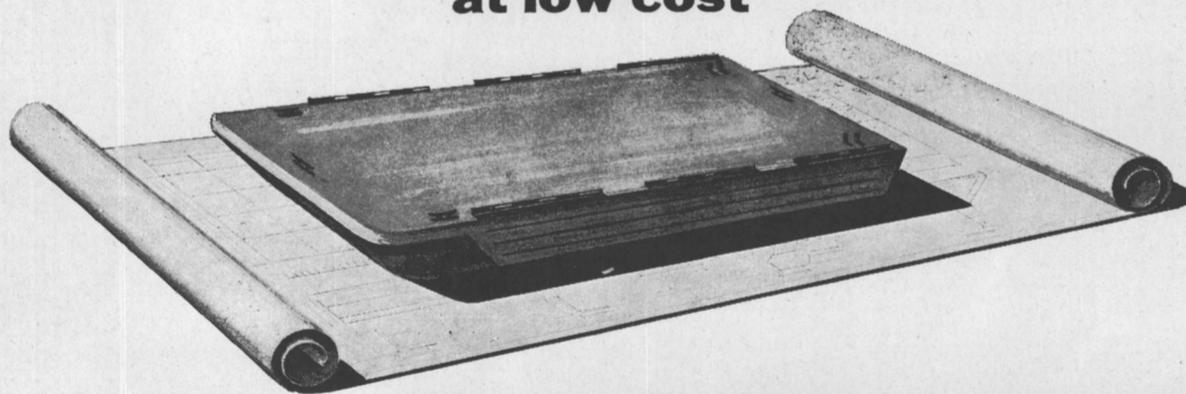
- Eliminating unnecessary downtime
- Reducing your risks and liability
- Increasing equipment life
- Improving the safety in your plant

*Fundamentals of Fluid Power* is available for your inspection on a 30 day trial basis. Taking the 30 day preview does not oblige you to buy. We offer 30 day previews because we want our customers convinced that *Fundamentals of Fluid Power* is the best hydraulic training program on the market. When you send for your preview you will receive; color slides in carousels, pulsed sound tracks in cassettes, instructor's guide, workbooks, and tests.

For more information, contact; Industrial Media Inc. 6303 28th St. S.E., Grand Rapids, MI 49506

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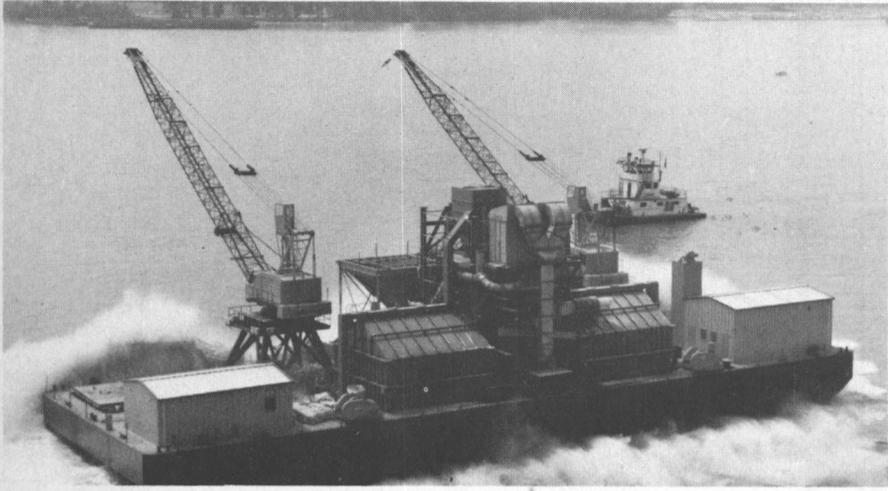


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**Built By Jeffboat, Inc., The Gemini Will Transfer Bulk Materials To Ships In New Orleans Area**



Equipped with twin cranes, the fully automated Gemini features 12 separate modes of transfer operations.

Jeffboat, Inc., Jeffersonville, Ind. 47130, has announced the completion of hull construction and equipment installation on the Gemini—one of the world's largest floating bulk material transfer plants.

Owned and operated by Mid-Stream Transfer, Inc. of Metairie, La., the Gemini will work in the New Orleans, La., area transferring grains and other bulk materials from barges to oceangoing vessels.

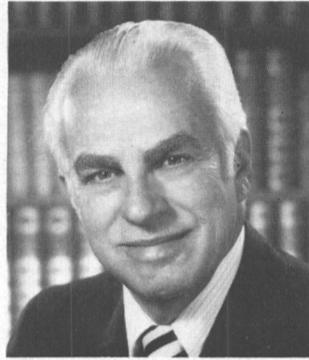
The Gemini, with twin cranes, will have a rated capacity of 1,000 tons per hour, more than twice the capacity of other transfer ves-

sels in the busy New Orleans exporting waterfront.

The fully automated vessel features 12 separate modes of transfer operations, all controlled by an operator in a control cab 80 feet above the deck. Two conveyor systems, rising to a height of 140 feet above the deck, employ a spill-free transfer technique, with elevating legs and loading boom conveyor totally enclosed and dust-tight.

The Gemini is equipped with complete dust collectors, an automatic bulk weighing system, and diesel-driven electric generators providing 2,115 kilowatts.

**Chevron Shipping Elects William Banks President**



William H. Banks

William H. Banks, vice president and general manager-operations, Chevron Shipping Company, San Francisco, Calif. 94105, has been elected president, effective August 1. He replaces Lawrence C. Ford, who is retiring after 40 years of service.

Chevron Shipping Company, a subsidiary of Standard Oil Company of California, directs and manages tanker, barge and re-

lated shipping activities of Standard's U.S. and international fleets in worldwide oil transport operations.

Mr. Banks will be replaced by Douglas C. Wolcott, currently manager, Traffic Division. The new manager, Traffic Division, will be Charles A. Jordan.

Mr. Banks is a native of Louisiana and a graduate of the University of Arkansas. He served in World War II, leaving the U.S. Army Air Corps in 1946 as a lieutenant colonel.

He joined the Standard organization in Los Angeles in 1947 as a Marketing Department engineer. The following year, he was assigned to pipeline operations. Subsequently, he was appointed to a variety of increasingly responsible petroleum supply and distribution and management assignments.

Mr. Banks was transferred to Chevron Shipping in 1965, and the following year he was named vice president and general manager-operations, a position he held until the present.



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## U.S. Maritime Operations Cited For Outstanding Safety Records

Some two dozen United States maritime enterprises, including operators of ocean tankers, general cargoliner vessels, stevedoring and marine terminal facilities, towboats and military ships and shipyards were cited for outstanding records in industry safety.

Their achievements in prolonged accident-free operations were recognized at a special Ship Safety Awards Luncheon at the New York Downtown Athletic Club, sponsored annually by the American Institute of Merchant Shipping (AIMS) and the Marine Section, National Safety Council (NSC). The two groups are leaders in nationwide efforts of the seagoing and shoreside maritime industry in promoting safety and health for its workers.

With Vice Adm. **William F. Rea III**, Commander of the U.S. Coast Guard's Atlantic Area and its Third District based on Governors Island, heading a gathering of upward of 100 industry and government officials on hand for the event, the winning organizations were singled out for safety accomplishments that, in some instances, range over many years. A total of 39 citations were involved in the program this year.

Two types of awards were presented. The Marine Section of NSC based its citations on safety activities over the past year and the awards were issued by Admiral Rea and Capt. **Lars Pedersen**, general chairman of the Marine Section. On the other hand, AIMS based its awards on accident-free operations over extended periods of time by American-flag ocean vessels. Known as the Jones F. Devlin Awards, the presentations were made by AIMS president **James J. Reynolds** and Capt. **Jones F. Devlin**, a former official with

United States Lines Co., after whom the award is named.

A total of 12 companies were eligible to receive the Devlin Award this year, and 23 different ships were cited for continuous operations with no member of the crew missing a turn on watch due to injury.

The Devlin Award has three categories—a two-year minimum, a four-year minimum, and a five-year minimum. And, to underscore the remarkable nature of the safety achievements by such vessels in the AIMS program, six of the ships have operated in accident-free status for between nine and 12 years.

In the five-year category, awards were presented to 10 vessels. They are Middleton and Ashland of Columbia Transportation; Ashley Lykes of Lykes Bros. Steamship Co. Inc.; New York Getty of Getty Fleet Corporation; Texaco Montana, Texaco Georgia, and Texaco Massachusetts of Texaco Inc.; Amoco Illinois of Standard Oil Company (Indiana), and American Ace and American Lark of United States Lines Co.

The four-year category of the AIMS Devlin Award included presentations to one vessel, the Louise Lykes of Lykes Bros. Steamship Co.

In addition, a total of 12 ships were eligible for awards in the two-year category. They included the USNS Bartlett of Military Sealift Command; Exxon Baton Rouge of Exxon Company, USA; Ruth Lykes and Charlotte Lykes of Lykes Bros.; Mobil Aero of Mobil Oil Corporation; Providence Getty of Getty Fleet Corporation; Great Land of InterOcean Management Corp.; Texaco California of Texaco Inc.; Amoco Connecticut of Amoco Shipping Co.; Delta Sud of Delta Steamship Lines Inc., and Pioneer Contender and Pioneer Crusader of United States Lines.

The Marine Section, National Safety Council

awards went to Exxon Company, USA-Everett, Mass., and Exxon Company, USA-Linden, N.J., based on accident-free operations in the past year.

In addition, 14 companies were otherwise cited for outstanding records last year. They included Boston Towboat Company; Nilo Barge Line, Inc.; American President Lines, Ltd.; American Steamship Co.; Ashland Petroleum Company-Marine Repair Terminal; Atlantic Cement Co.-Marine Division; Exxon Company, USA; Howland Hook Marine Terminal Corp.; Neptow Towing Co.; Oglebay Norton Co./Columbia Transportation Division; Pearl Harbor Navy Shipyard; Pitts & Conneaut Dock Co.; Texaco Inc., and United Brands Co.

As leaders in maritime safety, AIMS and the Marine Section of NSC engage in a variety of programs designed to promote accident-free activity.

AIMS represents American-flag vessel companies throughout the country, and it is the largest such organization in the U.S. merchant marine industry.

The Marine Section is one of 28 industrial components comprising the National Safety Council, and it is the largest organization in the U.S. ship industry devoted to safety.

## J.B. Hargrave Names Dawson Vice President

J.B. Hargrave, Naval Architects, Inc. of West Palm Beach, Fla., has announced the appointment of **Dudley A. Dawson** as vice president, with principal responsibility for the firm's commercial craft design.

Mr. Dawson joined the company in 1974 after three years as naval architect at Coast Guard Headquarters in Washington, D.C. He is a graduate of Webb Institute, a member of The Society of Naval Architects and Marine Engineers, and is a Florida registered professional engineer.

Projects in which he has participated during his four years with the Hargrave firm include CATUG integrated tug-barge combinations, fishing vessels, fast aluminum ferries, sightseeing vessels and a variety of marine consulting assignments. He has also assisted on a number of projects in the firm's very considerable pleasure craft design work.

As a result of his experience with the USCG, he is uniquely qualified to monitor the firm's design output for compliance with the many regulations now affecting the marine industry.



*This announcement appears as a matter of record only.*

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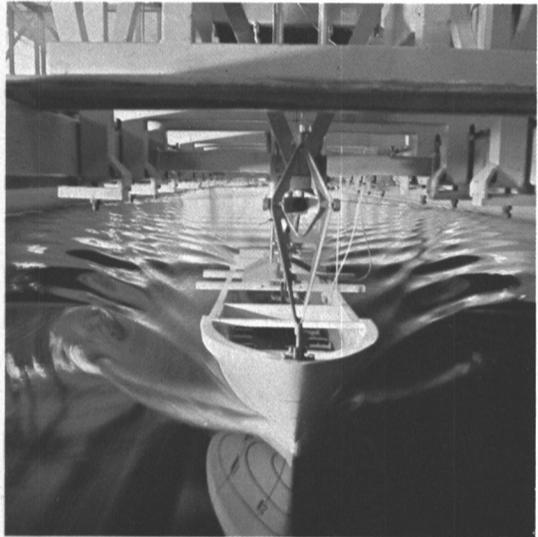
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*The undersigned has underwritten and publicly offered the above Bonds.*

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Pathfinder® Radars feature Raytheon's exclusive two-level digitized video-enhancement. As a result, larger and taller targets are displayed even more brilliantly than smaller or lower targets. The

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Raytheon's Variable Range Marker gives continuous digital readouts from 0 to 64 miles.

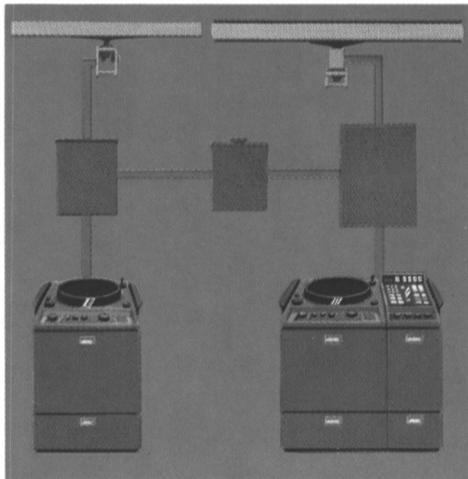
**Automatic intensity control  
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viewing, you can rely on Raytheon for increased scope life. Special video amplifier circuits selectively reduce gain on strong, short-range echoes. This automatically assures a uniform intensity level over the entire scope on all ranges. Viewing is easier... and scope life is increased by eliminating excessive intensity in the center of the scope.

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All operating controls are back-lighted.

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Both 3 and 10-cm Mariners Pathfinder® Radars feature transmitters with very high "average-power" outputs. This ensures maximum long-range target detection.

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**Interswitchable 3 and 10-cm systems for optimum radar versatility.**

Raytheon has provided over 3000 vessels with dual 3 and 10-cm radar interswitch systems. Connecting the antennas, transmitters and the Mariners

Pathfinder® displays, Raytheon's Interswitch Unit lets the operator select any desired combination of 3 and 10-cm presentations.

Typically, one display might be used with 3-cm and the other with 10-cm transmission. However, weather or navigational requirements might dictate that both displays be used on either 10 or 3-cm... one on long range, one on short range... one relative motion, the other true motion.

Whatever the situation demands, Raytheon's Interswitch System lets you select the best radar combination for the job.

**Choice of two relative/true-motion units... with simple collision assessment, or computerized collision warning and avoidance.**

A true motion display, in which fixed objects remain stationary while your ship and other vessels move across the scope on their true courses, improves navigation and collision avoidance

capabilities. Raytheon gives you a choice of two units, each with an Electronic Bearing Line (EBL) that may be positioned anywhere on the display.

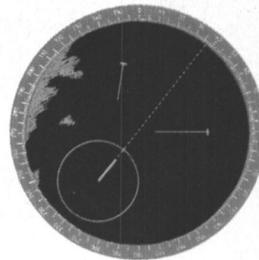
The low-cost TM/AC unit provides a microprocessed true-motion presentation for both the 12 and 16-inch relative motion displays. For collision assessment it displays true and relative courses for up to eight selected targets.

Raytheon's new computerized Anti-Collision Unit (ACU) is one of the most advanced relative and true-motion displays available. It is designed to meet U.S. Coast Guard proposals and MARAD requirements for merchants ships.

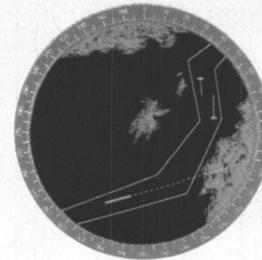
A compact unit that attaches



ACU vectors show true course and speed of tracked targets.



ACU alarm sounds when approaching target penetrates guard ring.



ACU electronic bearing lines set up navigation fairways.

directly to a Mariners Pathfinder® 16-inch display, the ACU will automatically track as many as 20 targets with computer-generated collision warning and digital-readout collision avoidance data. The Raytheon ACU also gives you trial maneuver information, collision avoidance guard rings around the ship, navigational fairways, CPA (Closest Point of Approach) and TCPA (Time to CPA) for tracked targets, and much more.

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**National Maritime  
Historical Society  
Elects Admiral Will**

Adm. John M. Will, USN (ret.), chairman of Arthur Tickle Engineering Works in Brooklyn, N.Y., has been elected chairman of the National Maritime Historical Society. He succeeds Rear Adm. Walter F. Schlech Jr., USN (ret.), of Annapolis, Md., who served the

National Society as chairman for a five-year term beginning in 1973.

The National Maritime Historical Society is sponsor of the Ship Trust, which unites the interests of sea training, nautical archeology, historic ships, and maritime museums. Under the Ship Trust program, the Society recently brought back to the United States the remains of two sailing ships of a hitherto extinct type—the American Down Easter. A sec-

tion of the St. Mary has been returned to the Maine State Museum in Augusta, capital of her native state, and parts of the Kaiulani have been brought back to San Francisco, Calif., her home port throughout her sailing life. The Ship Trust is also concerned with the preservation on the East and West Coasts of Liberty ships built during World War II as “ugly ducklings” of the merchant marine, the return of the immi-

grant sailing schooner Ernestina/Morrissey to Massachusetts, and other projects across the United States.



Adm. John M. Will

Admiral Will commanded a submarine squadron in the Pacific in World War II and subsequently served as Commander, Amphibious Forces in the Far East. This was followed by duty as Commander of the Military Sea Transportation Service. In 1959, he retired from the Navy to become president and subsequently chairman and president of American Export Lines. He has served as president of the New York Shipping Association, and as director or trustee of a number of maritime institutions, including the New York State Maritime College. He was the founding president of the New York State Maritime Museum, and has served since 1976 as advisor to the National Maritime Historical Society, and chairman of its Maritime Industry Committee.

**EDIC Names J. Dalziel  
Engineering Mgr.-Boston  
Marine Industrial Park**



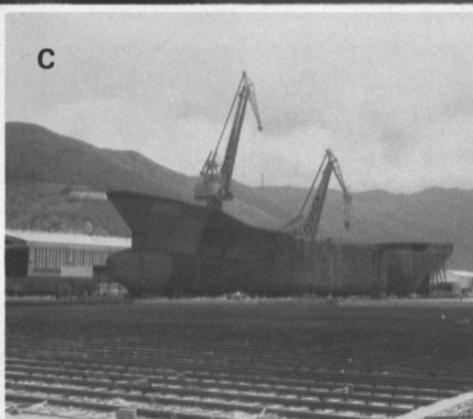
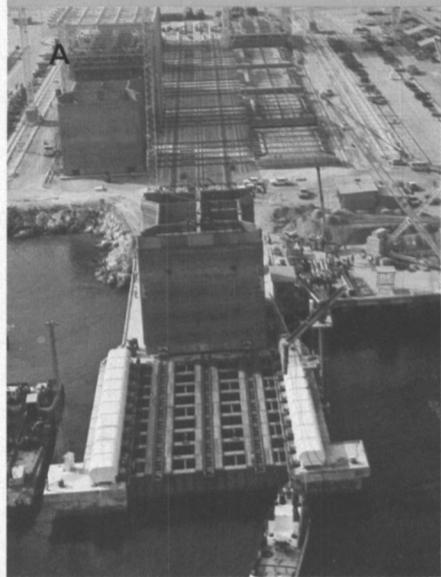
Jack Dalziel

The Economic Development and Industrial Corporation of Boston, Mass., has announced the appointment of Jack Dalziel as engineering manager of the Boston Marine Industrial Park.

An engineering/management professional with more than 20 years of experience, Mr. Dalziel comes to EDIC from Balco, Inc., where he served as vice president of the Contracting Division and where, among many other duties, he was responsible for marketing, sales, and production of engineering and mechanical installations.

The Boston Marine Industrial Park's 100 acres contain a number of buildings formerly occupied by the Navy and now available for occupancy by industrial firms. The 1,176-foot drydock currently in use is also available to ship repair firms.

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## American Society Of Naval Engineers Names Ivan Monk President

Ivan Monk, currently vice chairman of the board of directors of DeLaval Turbine Inc., assumed leadership of the American Society of Naval Engineers on June 30, 1978, as the 85th president of the Society. The presidential term of the Society is one year.



Ivan Monk

Mr. Monk graduated from the Georgia Institute of Technology in 1934, receiving his B.S. degree in mechanical engineering, and subsequently from the Advanced Management Program, Harvard Business School, in 1956. He was commissioned ensign, U.S. Navy, upon his graduation from Georgia Tech in 1934, and from 1941 until 1943 served as engineer officer on the destroyer USS Blakely, during which period he was awarded the Legion of Merit for his role in saving the Blakely after she was torpedoed and blown in half in the Caribbean Sea in May 1942. From 1943 until 1945, he served as engineering officer, USS Bataan, and in this capacity was awarded the Bronze Star for his performance of duty which enabled the Bataan to steam continuously for over 39,000 miles without stopping during operations against enemy Japanese forces in the Pacific Theatre of Operations.

Subsequent thereto, he was engineer officer on the aircraft carrier USS Princeton (1946-47); assistant director, Naval Boiler and Turbine Laboratory, in charge of development testing of advanced designs for turbines, gears, and boilers (1947-49); and in charge of the Turbine and Gear Branch, U.S. Navy Bureau of Ships (1949-53). From 1953 until 1955, he was Design Superintendent, New York Naval Shipyard, and was in charge of the design of the aircraft carrier USS Saratoga, the first carrier to be fitted with a high-pressure, high-temperature steam plant, as well as a self-tilting mast to permit it to pass beneath the Brooklyn Bridge without major structural removal prior to each such passage. In 1955, Mr. Monk returned to the Bureau of Ships where he was in charge of the Aircraft Carrier Branch until 1958, when he became the Director of the Machinery Division, an

assignment which he held until 1960 when he retired from the U.S. Naval Service, having attained the rank of captain.

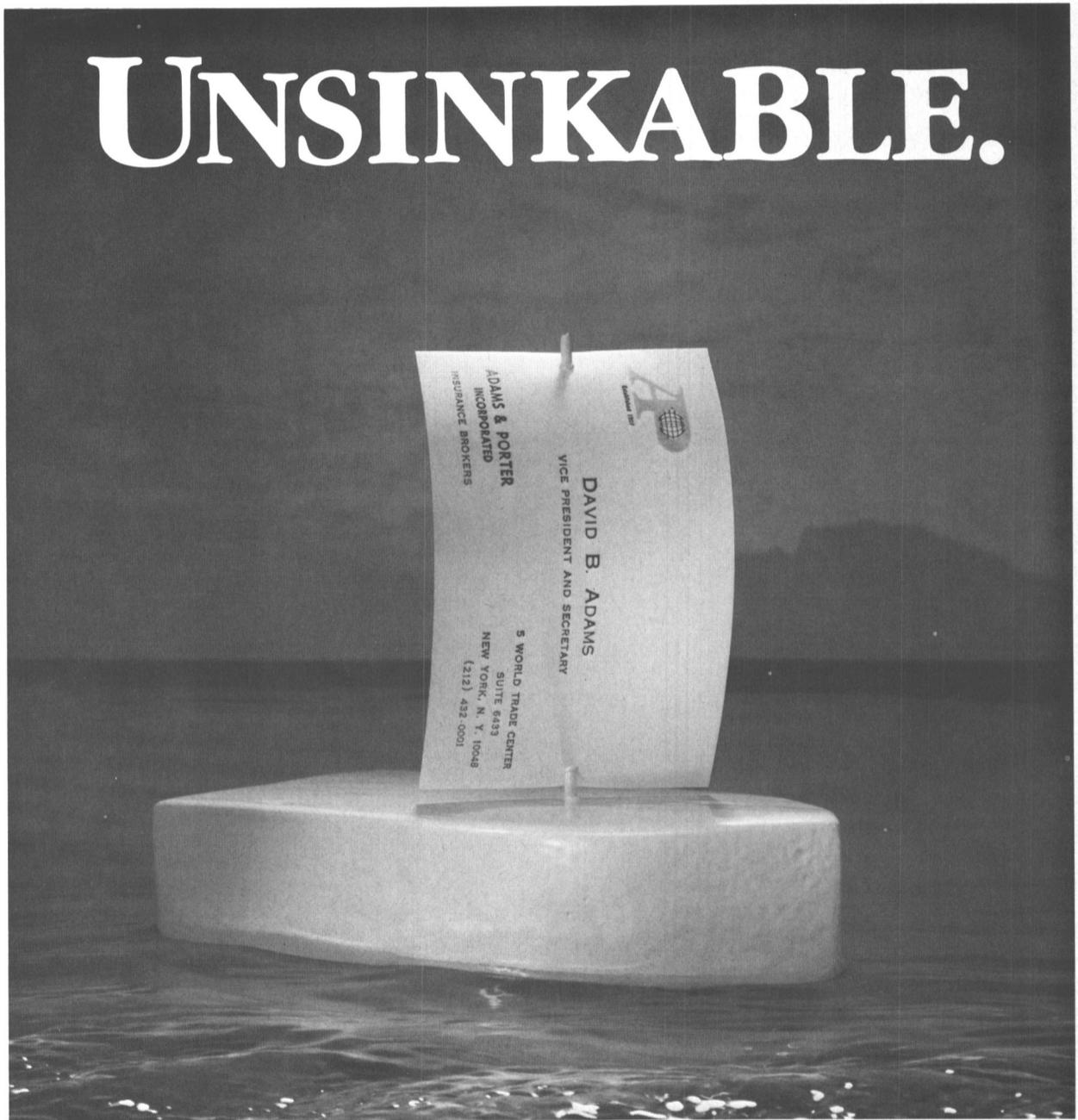
In 1961, he joined DeLaval Turbine Inc. as manager of the Service and Repair Department, Turbine Division. Shortly thereafter, he was promoted to vice president and general manager of the Turbine Division, subsequently assuming positions of responsibility, including group vice president, ex-

ecutive vice president, and president and chief executive officer until 1975, when he was elected vice chairman of DeLaval's board of directors, a position he currently holds.

He is a fellow in the American Society of Mechanical Engineers and past chairman of its Trenton Section; a member of The Society of Naval Architects and Marine Engineers and past chairman of its Philadelphia Section; and a

member of Phi Sigma Kappa and Pi Tau Sigma. In addition, he is listed in Who's Who in the World, and Who's Who in America, is a registered professional engineer in the District of Columbia, and has held an unlimited chief engineer's license in the U.S. merchant marine since 1943. Mr. Monk joined the American Society of Naval Engineers in 1946, subsequently serving on its National Council and as its vice president.

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## NYC Requests Proposals For Use Of High-Speed Passenger Vessels

The Tri-State Regional Planning Commission and the New York Department of Transportation, Bureau of Ferries and General Aviation Operations, is engaged in a United States Department of Transportation, Urban

Mass Transportation Administration Demonstration Project to test the feasibility of using high-speed marine passenger vessels in the New York City Metropolitan Area waterways.

Proposals are requested from qualified contractors for providing equipment and related services on a lease basis.

The proposed demonstration project will use a minimum of

one and not more than three high-speed marine vessels, with a minimum seating capacity of 80 passengers. A contract will be executed with a single firm to provide, under lease arrangement, the required equipment and services.

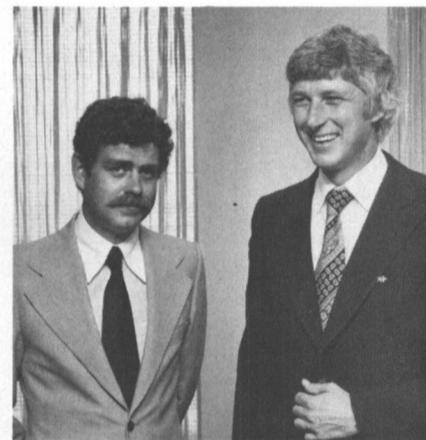
Further information may be obtained in person or by writing. Requests for Proposals may be obtained only on written request

to: Tri-State Regional Planning Commission, c/o John Mok, Senior Coordinator, One World Trade Center — 82nd Floor, New York, N.Y. 10048.

Proposals must be received by the Tri-State Regional Planning Commission at the above address on or before 5 p.m., August 18, 1978.

## Burmeister & Wain American Corporation Organizational Change

In the light of the increasing emphasis on minimizing fuel oil consumption and the subsequent widening interest among U.S. shipowners for the application of the low-speed diesel engine, Burmeister & Wain American Corporation has recently carried out an organizational change, which is meant to further ensure a strengthening of their customer relations.



Named in the recent BWAC organizational change are (left) Lars Krieger Thomsen and (right) Claus Windelev.

The Burmeister & Wain American Corporation (BWAC) is a wholly owned subsidiary of Burmeister & Wain A/S, Copenhagen, Denmark.

In order to intensify the efforts of all their diesel engine oriented activities in the U.S., the various related divisional groups, Engineering, Marine Service, etc., will now be managed by one central body, the Diesel Group.

The manager of the Diesel Group is Claus Windelev, who will refer directly to the president of BWAC, P.C. Knudtson, in all corporate matters, and directly to the divisional managers for the respective B&W divisions in Copenhagen in all product matters.

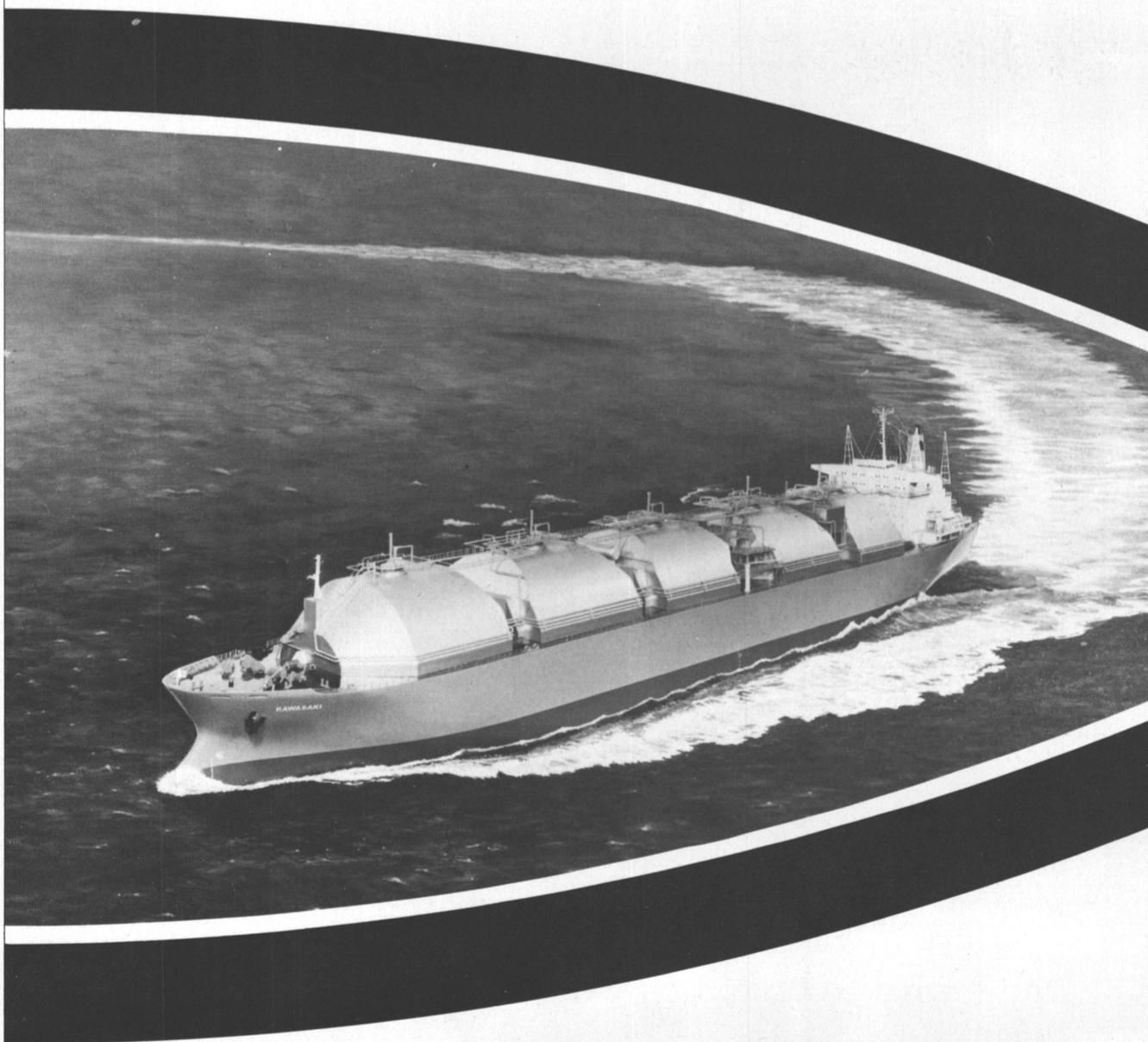
The Marine Service operations in the U.S., including those conducted through their well-reputed New Orleans (La.) Service Center, are being managed by Lars Krieger Thomsen, who is referring directly to Mr. Windelev.

Mr. Windelev, who has a B.S. degree in mechanical engineering from the Technical University of Copenhagen, prior to his New York assignment was in charge of the R&D function in the 4-stroke, medium-speed department at B&W, Copenhagen.

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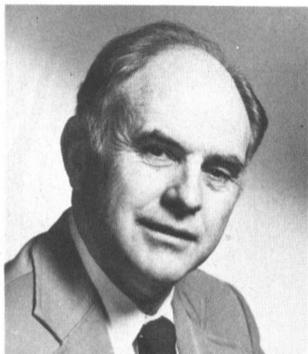


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## Worthington Engineered Pump Division Names Kenneth McGuckin VP

Kenneth J. McGuckin, Taneytown, Md., has been promoted to the position of vice president of the Engineered Pump Division of Worthington Pump Corporation. He will be responsible for the operations of both the Harrison, N.J., and Taneytown manufacturing and marketing operations.



Kenneth J. McGuckin

Mr. McGuckin has been an employee of Worthington for over 25 years, and has held many responsible positions within the company. Most recently, he has been general manager of the manufacturing operation at Taneytown. He has worked in product engineering, quality assurance, manufacturing, research and plant management. Mr. McGuckin is a BSME graduate of Tufts University. He also has an M.S. degree from Stevens Institute of Technology.

Worthington Pump is the world's largest pump company with 21 manufacturing locations in 13 countries. Its U.S. facilities are located in Harrison and East Orange, N.J., Taneytown, Md., and Shawnee, Okla. They manufacture pumps for the electric utility and public works, petroleum, chemical and petrochemical, marine, agricultural and general industries.

## McDermott Delivers Tug/Supply Vessel To Int'l Mooring & Marine

International Mooring & Marine, Inc. recently took delivery of a new 180-foot 3,000-horsepower tug/supply vessel from McDermott Shipyards, New Iberia Division. The M/V Inmar Duke is the second of a four-boat package being constructed for International Mooring & Marine, Inc. and its affiliate, First Inmar of Texas, Ltd.

International Mooring & Marine, Inc., P.O. Box 1553, New Iberia, La. 70560, founded in June 1976 by Charles Mann, Harry Wilson and Wilton Helveston, primarily as an anchor-handling company furnishing personnel, equipment and tools for mooring offshore floating-type drilling vessels. The company also designs and fabricates various types of

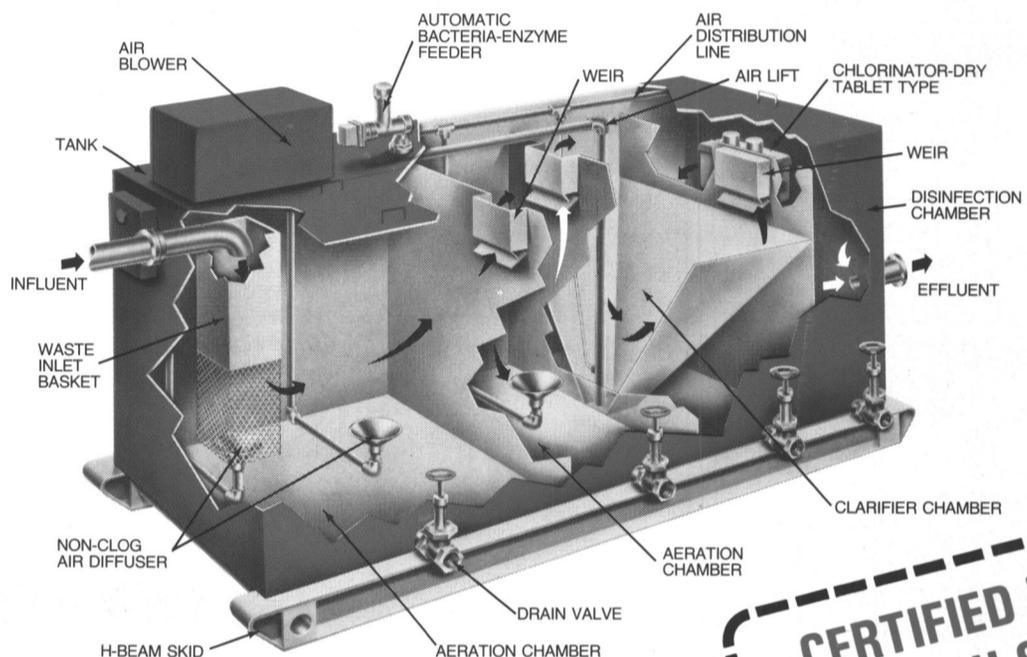
mooring systems. International Mooring & Marine, Inc. is also engaged in platform repair and maintenance. Another major service is the fabrication and installation of platform boat bumpers. The company has developed its own boat bumper design and is presently applying for a patent.

In christening ceremonies for the M/V Inmar Duke, held at

McDermott Shipyards on June 4, 1978, Mr. Mann stated that these are the first boats of this type ever built at the Port of Iberia. The Port of Iberia is expected to become a major Gulf Coast port due to its centralized location, proposed deepwater channel, space for expansion and natural protection from hurricanes and floodings.

Mr. Mann also stated that International Mooring & Marine, Inc. has a 190-foot, 5,000-horsepower tug/supply vessel under construction at Bourg Shipyard, Houma, La. With the delivery of this vessel in September 1978, the company will have taken delivery of five tug/supply vessels in 1978, at a total cost of approximately 13 million dollars.

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**Fast.** Special bacteria-enzymes accelerate degradation and maintain a viable biology. In a day's operation, the Demco system will process as

much as 25% more sewage than competitive designs. Standard Demco units process from 325 to 12,500 GPD. Larger systems are available for special applications.

**Effective.** Demco system design treats all degradable wastes including difficult materials like paper, grease, oil, detergents and garbage processed through a disposal with impressive results. When operated using recommended procedures, Demco sewage treatment plants will remove 85-95% of BOD and suspended solids. The effluent contains a minimum chlorine residual of 1 mg./liter and 1,000 or less coliform bacteria per 100 milliliters.

**Reliable.** Demco sewage treatment plants perform. Performance that

has earned National Sanitation Foundation certification (Standard 23). Demco plants are also certified by the U.S. Coast Guard, and meet or exceed U.S. Geological Survey and anticipated IMCO effluent requirements.

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**Bremer Vulkan Names  
T.A.S.T. Corp. Exclusive  
U.S. Representatives**

Bremer Vulkan Schiffbau Und Maschinenfabrik, located in Bremen, Germany, has announced the appointment of the T.A.S.T. Corporation, International Marine Representatives, of 5 Farmstead Road, North Caldwell, N.J. 07006,

as their exclusive U.S. representative for ship construction and repair.

Alfred E. Stanford, president of T.A.S.T. Corporation, has over 25 years' diversified experience in the marine industry, 10 years of which have been spent in Europe, and his knowledge of the method of new construction and repair makes this representation very appropriate.

Mr. Stanford is a graduate from the State University of New York Maritime College in 1950, with a B.M.S. degree. He is a chartered engineer, a member of The Society of Naval Architects and Marine Engineers, a fellow of the Institute of Marine Engineers, and a fellow of the Royal Institution of Naval Architects.

Mr. Stanford is also president

of Environmental Safety Associates, Inc.

Since its beginning in 1805, then known as the Johann Lang Shipyard, Bremer Vulkan have constructed over 1,300 vessels, including ULCC's, container carriers and all types of vessels for the general cargo trade. In addition to many large-scale conversions, numerous individual machinery plants have been successfully carried out.



Alfred E. Stanford

The facilities offered are: large dock, 331.60 by 57.46 by 7.70 meters (about 1,088 by 189 by 25 feet), 450-ton crane; floating dock, 170 by 23 by 6 meters (about 558 by 75 by 20 feet), 8,500-ton lifting capacity; repair quays for simultaneous repair of several vessels, crane up to 150 tons, floating crane; and repair base at Bremerhaven with floating dock.

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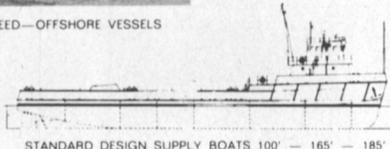
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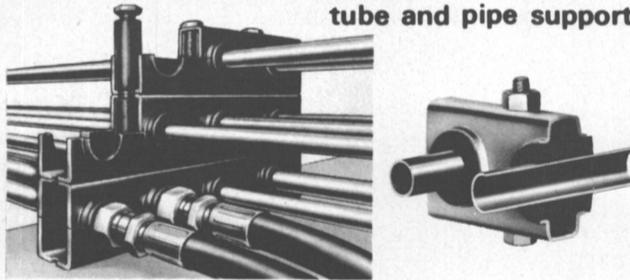


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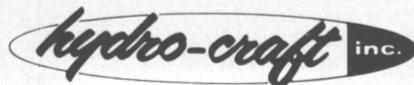
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**Bird-Johnson**  
Expands Product Line  
—Brochure Available

Bird-Johnson Company, Walpole, Mass., has undertaken the exclusive U.S. distributorship for SKF Steel, Coupling Division, Hofors, Sweden. Under this agreement, BJCo will market the OK coupling to both marine and industrial concerns.

The OK-HB coupling will be made available to suit shaft diameters ranging from 25 mm to 1,000 mm. This translates into a torque transmission capacity of 258 ft./lbs. to 19,177,600 ft./lbs. In addition to the HB type, Bird-Johnson will also introduce two new OK couplings to the U.S. These are the OK/flange combination coupling and the industrial OKL coupling. Each is engineered to meet industry standards, and is approved by international classification societies.

The advantages to be realized from using an OK coupling—both from a cost and operating point of view—are detailed in a new brochure released by SKF. To obtain your copy, write to Carol A. Iredale, Bird-Johnson Company, 110 Norfolk Street, Walpole, Mass. 02081.

**Southeast Asian  
Technical Committee  
Formed By ABS**

A new technical committee has been formed by the American Bureau of Shipping (ABS) for the purpose of enabling ABS to maintain closer contacts with scientific and technical matters relating to shipbuilding and engineering in Southeast Asia. The formation of the 33-member Association of Southeast Asian Nations (ASEAN) Technical Committee was announced by **Robert T. Young**, chairman of the board of ABS.

Mr. Young said that the committee is composed of prominent individuals in maritime affairs. Chairman of the committee is **Chor Teck Chua**, managing director, Keppel Shipyard, Republic of Singapore, and the vice chairman is **Miguel Magsaysay**, president, Magsaysay Lines, Inc. Philippines.

The inaugural meeting of the committee was held on July 11 in Singapore, and was attended by Mr. Young and **Warren L. Anderson**, principal surveyor for the Orient, and personnel from the other ABS offices in Southeast Asia.

The Association of Southeast Asian Nations is the 15th overseas technical committee maintained by ABS. In addition to Mr. Chua and Mr. Magsaysay, the members of the new committee are:

From Indonesia — Capt. Drs. **M.J.P. Hahijary**, president/director, P.T. Djakarta Lloyd; Ir. **S. Harsono**, director of marine industries, Direktorat Industri Perkapalan, Ditjen Industri Logam Dan Mesin; **M. Husseyn Umar**, S.H., president/director, Pengembangan Armada Niaga Nasional, P.T.; **Soetopo Iman**, president/director, P.T. Pertamina Tongkang, and **Adil A. Nurimba**, president/director, P.T. Gesuri Lloyd.

From Malaysia—**Leslie Eu**, director and general manager, Malaysian International Shipping Corporation Bhd., and **Ibrahim Mohamed Taib**, joint general manager, Malaysia Shipyard and Engineering Sdn. Bhd.

From Philippines — **Roberto S. Benedicto**, chairman, Northern Lines, Inc.; **Q.S. Camus**, president, Atlantic, Gulf & Pacific Co. of Manila, Inc.; **Robert Coyiuto**, president, Pioneer Insurance Companies; **Constante Farinas**, chairman, National Development Company; **Jose P. Fernandez**, president, Compania Maritima; **Carlos Ledesma**, president, Negros Navigation Company; **Bienvenido L. Lim**, president, Reyes & Lim Company, Inc.; **Eduardo J. Rodriguez**, president, National Steel Corporation; **Adm. Hilario M. Ruiz**, president, Philippine Dockyard Corporation; **Col. Generoso F. Tanseco** (ret.), Administrator, Maritime Industry Authority, and **Emilio**

**T. Yap**, president, Philippine President Lines, Inc.

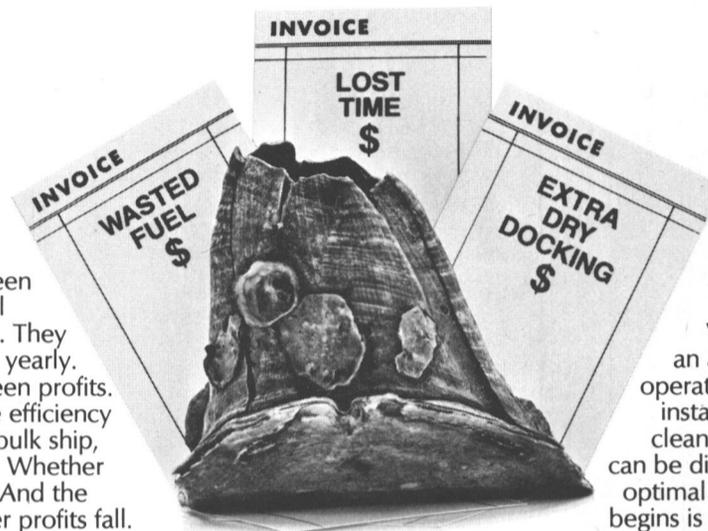
From Republic of Singapore—**Brian Chang**, chairman/managing director, Promet Private Limited; **Y.C. Chang**, managing director, Pacific International Lines (Pte.) Ltd.; **Gek Khiam Koh**, managing director, Sing Koon Seng Private Limited; **Kok Kim Kuah**, chairman, Asiatic Navigation International Limited; **K.C. Lee**, chairman, Asia-Pacific Shipyard Pte.

Ltd.; **S.Y. Loh**, director, Robin Group; **Guan Onn Low**, joint managing director, Jurong Shipyard Limited; **Cheng Eng Lua**, general manager, Neptune Orient Lines Ltd.; **P.H. Meadows**, chairman/managing director, Far East-Levingston Shipbuilding Ltd.; **Isoe Takezawa**, president and director, Mitsubishi Singapore Heavy Industries (Pte.) Ltd.; **C.N. Watson**, managing director, Sembawang Shipyard Limited,

and **Conan Wu**, Conan Wu & Associates Pte. Ltd.

From Thailand — Rear Adm. **Banpot Sudswang**, R.T.N., director general, Thai Maritime Navigation Company, Ltd.

The American Bureau of Shipping is an international ship classification society that establishes standards, called Rules, for the design, construction, and periodic survey of merchant vessels and other marine structures.



Barnacles, sea lettuce, green algae, tube worms. They all have one thing in common. They chew up millions of dollars yearly. Dollars that should have been profits.

They're slow death to the efficiency of any ship. Whether it's a bulk ship, tank ship or dry cargo ship. Whether it's a coastal ship or VLCC. And the bigger they come, the faster profits fall.

With regularly scheduled SCAMP® underwater hull cleanings, fuel savings alone for VLCC's operating between 12 and 14 knots can be anywhere from \$210,000 to \$340,000 over a 2½ year dry dock cycle.

Depending on water temperature, displacement, weather, currents and other variables. Interesting?

Regularly scheduled cleaning will extend dry dock cycles. Vessel downtime is reduced to an absolute minimum and normal operations proceed on schedule. For instance, a 250kDWT VLCC can be cleaned in 8 to 12 hours—and cargo can be discharged at the same time! An optimal cleaning program after fouling begins is once every round trip for long haul vessels, and every three to four months for other vessels. SCAMP hull cleaning stations are strategically located on major trade routes. Bookings can be arranged to accommodate ships' schedules worldwide by contacting Butterworth Systems, our Sales Representatives or any SCAMP hull cleaning station.

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ARUBA & CURACAO (Caribbean)  
Peters Divers Co. Ltd.  
Cable: PDC Curacao PDC Aruba

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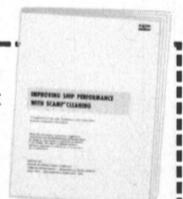
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## C.J. Hendry Company Announces Appointments

Fred Barg, vice president, C.J. Hendry Co., San Francisco, Calif., announces two major changes within the firm's branch in southern California.

Warren (Scotty) Phalen returns to the company as branch manager, San Pedro, with Wally Lynn designated as assistant manager. Ms. Jean Herring was named office manager.

Messrs. Phalen, Barg and Lynn are certainly no strangers to each other as it was Mr. Phalen who was responsible for showing Mr. Barg and Mr. Lynn the ship chandlery business in the early days of their meeting.

Mr. Phalen, San Pedro-born and educated, began with C.J. Hendry in 1937, with Mr. Barg joining the southern California branch in 1940. Mr. Phalen left for U.S. Army service in 1942, returning in 1946. He returned to Hendry

after spending over 25 years with Marine Hardware.

Mr. Lynn, also a San Pedro man, was employed at Marine Hardware until he joined the C.J. Hendry firm in 1977.

Mr. Phalen replaces John Iamarino, who resigned to accept a position with Crowley Maritime Corp., Terminal Island, Calif. In a personal letter, Mr. Barg expressed his appreciation for past services rendered, and wished Mr. Iamarino well in his new venture.

C.J. Hendry, ship chandlers since 1865, are not only noted for their marine services, but are considered safety manufacturing specialists for the marine and industrial industries. Their San Francisco manufacturing line includes Sea Jay chemicals and safety products such as Elliott life rafts, rope ladders, tarps and covers, nets, stretchers, and pump room and rescue equipment. They are also authorized service representatives for US Rubber life rafts in San Francisco.

## San Francisco Dedicates New Ferry Terminal



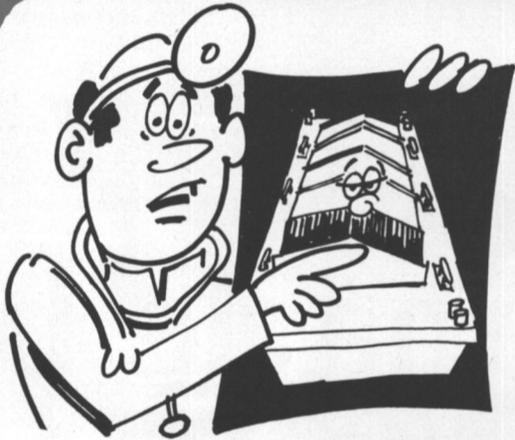
Golden Gate Ferry System's new \$3-million terminal is shown here behind San Francisco's historic Ferry Building. At dockside is one of the Ferry System's three Jacuzzi water-jet-propelled ferryboats, which carry 750 passengers each across San Francisco Bay to Larkspur in Marin County.

With Mayor George Moscone declaring the Golden Gate Bridge District Ferry System "an important transportation link to San Francisco's new downtown," civic dignitaries and U.S. Department of Transportation officials recently dedicated the new \$3-million San Francisco Ferry Terminal at the foot of Market Street east of the historic Ferry Building.

Stephan C. Leonoudakis, Bridge District director, stated that every five passengers that ride Golden

Gate ferries or buses remove four automobiles from the Golden Gate Bridge congestion.

The new Ferry Terminal, under construction since early 1977, was 80 percent funded by the Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation. UMTA has provided better than 70 percent of the financing for the District's three modern Jacuzzi water-jet-propelled ferryboats and the converted ship that makes the Sausalito run.



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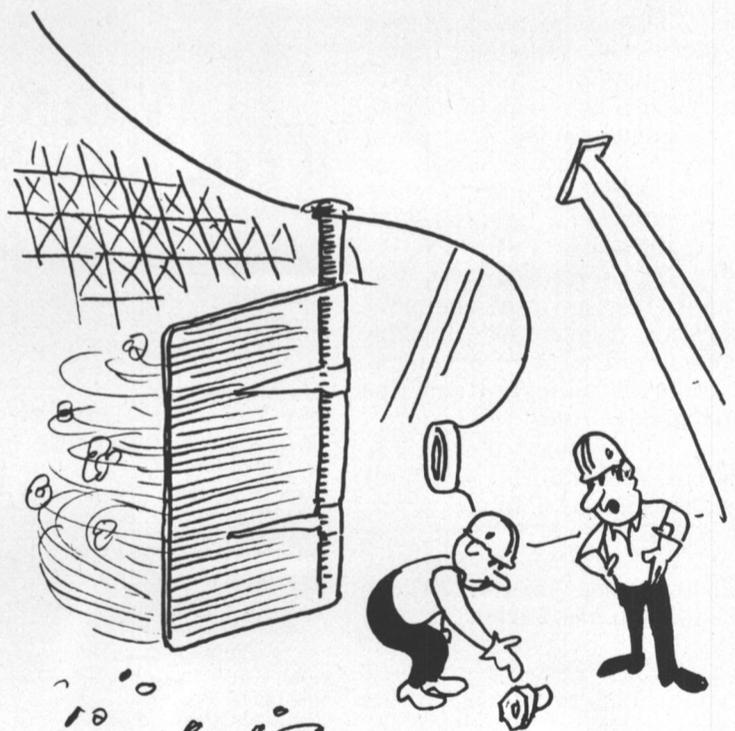
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## Merger Of Lykes Bros. Into LTV Corporation Approved By MSB

The Maritime Subsidy Board has approved the merger of Lykes Corporation, the parent company of Lykes Bros. Steamship Co., Inc. into LTV Corporation. Additionally, the Assistant Secretary has granted written permission for the domestic operation of vessels by an affiliated company of LTV.

Under the terms of the merger, Lykes Bros. Steamship Co., Inc. would be established as a separate wholly owned subsidiary of Jones & Laughlin Industries, Inc., which is a wholly owned subsidiary of LTV. The Attorney General of the United States approved the merger June 21, 1978.

The Transportation Division of Jones & Laughlin Steel Corporation, a subsidiary of LTV, owns and operates five towboats and owns or charters and operates some 210 barges for the transport of coal on certain inland waterways. Since Lykes Bros. Steamship Co., Inc. is a recipient of operating-differential subsidy (ODS), written permission from the Maritime Administration was required for these activities to continue.

Section 805(a) of the Merchant Marine Act of 1936, as amended, provides that recipients of ODS, or their affiliates, cannot own or operate vessels in the domestic trades without such written permission.

## Acetylene Gas Used To Straighten Ships' Decks

Sunderland Shipbuilders, part of British Shipbuilders, is using a new system of heat treatment to straighten the decks of ships. The technique, known as "flame straightening," uses dissolved acetylene gas in a specially developed blowpipe.

When a ship's deck is being constructed, stiffeners are positioned under the deck panels at spaces of between 700 and 800 millimeters. In between the stiffeners, ripples occur which can be as much as 25 millimeters deep.

Previously, straightening was achieved by positioning 76 millimeter flats underneath the deck, which was an expensive and time-consuming method. It is in the shipbuilder's interest to straighten some decks, as subcontractors applying covering compositions charge more if ripples are excessive.

Using the flame-straightening technique, Sunderland Shipbuilders has reduced the ripples to five millimeters variance with an average of two heat cycles. For particularly bad areas, three or four cycles may be necessary.

Panels are first checked using a straight edge, and then are heat treated using the gas in specially developed plate straightener blow-

pipes. Decks treated to date have a plating thickness of between eight and 12 millimeters.

Flame straightening has two significant advantages over previous techniques. These are a faster and more efficient operation with the multi-nozzle blowpipe, and the fact that the principles of application are easily learned by the average workman.

The method is now being used

by Sunderland Shipbuilders at each of its three yards in north-east England, and additional blowpipes are on order. At present, the accommodation decks only are treated in this way, but there is a possibility that hulls will also be treated by the same method.

Ships currently being treated are dry cargo vessels for the Bank Line of London, and bulk carriers for Yugoslavian owners.

The flame-straightening operation takes a man on average one week per ship.

The company has been using the system for six months, and group welding engineer Don Cuthbert reports that it is "the best method we have used to date."

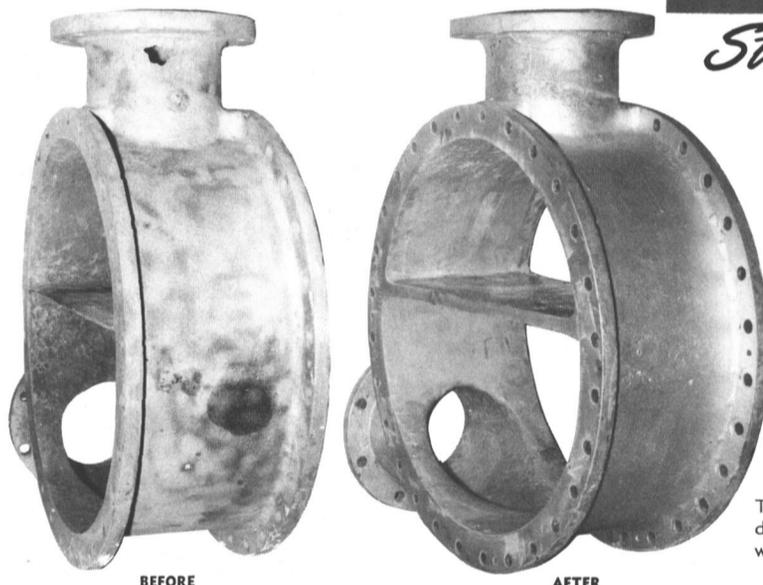
The process was developed by British Oxygen Company (BOC) in collaboration with Sunderland Shipbuilders.

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## G.E. 600 KW GEARED TURBO GENERATORS

- 2** 450/3/60/1200 RPM — 961 amps — type ATI — 0.8 PF. TURBINE: FSN-FN-20 6-stage—525 lbs/825°F — superheat 355°/371°F. GEAR: 10033/1200 — RPM 10033 — total—6390 lbs. steam/hr. steam flow.

## G.E. 400 KW TURBO GENERATORS

- 3** 450/3/60/1200—0.8 PF—641 amps. TURBINE: 6-stage—10059 RPM—525 lbs/825°TT — type GE 618N. Steam rate 5100 lbs/hr.—OAL 10' 10 1/2" — OAW 4' 10 1/2" — OAH 5' 5 1/4" — wt. 14,855 lbs.

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- 4** 400 KW (500 KVA) — 0.8 PF — 1200 RPM — 450/3/60. TURBINE: 585 lbs—840°TT — 28 1/2" vacuum—9018 RPM — serial 10A4462-3 & 10A4462-4. GEAR: 9018/1200 RPM. A.C. GENERATOR: 500 KVA — 400 KW—450 volts—641 amps—0.8 PF — 3-phase 60-cycle — 1200 RPM — CR 40° — excitation amps 41 — excitation voltage 120. Instruction book 5442. Switchgear available.

## UNUSED WESTINGHOUSE 60 KW 120 VDC M-20-EH

- 5** 120 VDC — 1800 RPM. TURBINE: M-20-EH — 20 lbs dry & saturated — 25" vacuum. 7283 RPM. GEAR: 7283/1800. GENERATOR: 60 KW — 120 VDC — 500 amps — SK — stab. shunt wound.

## UNUSED 500 KW DELAVAL-WESTINGHOUSE GEARED TURBO GENERATOR

- 6** GENERATOR: Westinghouse 500 KW — 120/240 volts DC — 2080 amps — 1200 RPM — stab. shunt. TURBINE: DeLaval — 730 HP — 440 PSI working — pressure condensing. Temperature 740° — 9977 RPM. HELICAL GEAR: 9977/1200 RPM. Serial # of turbine 245204 — weight 22,000 lbs.

# TURBINES & ROTORS

## BETH-SPARROWS POINT, QUINCY HULLS

- 7** 1 HP Turbine or rotor — Bethlehem  
1 400 KW Stator only — Westinghouse  
1 HP turbine casing only — Bethlehem  
1 Complete Westinghouse 400 KW turbo generator set  
1 Forced draft motor fan  
1 Anchor windlass — 2 11/16"  
Steering gear motors — 15 HP  
Forced draft fan impeller

## WESTINGHOUSE C-25 CARGO PUMP TURBINE ROTOR VICTORY-AP2 MAIN PROPULSION

- 8** Westinghouse AP2 19-stage HP rotor for 6000 HP Victory — serial #4A-2079 — equal to new. Unused surplus AP2 — Victory Ship complete HP & LP turbines  
Allis-Chalmers HP & LP  
Westinghouse LP AP2 with throttle valve  
G.E. HP & LP with throttle valve

## VICTORY-AP3 MAIN PROPULSION NEW 8500 HP G.E. TURBINES

- 9** Large Victory or C-3  
HP #72271 LP #72272  
10 Boxes spare parts, tools & fittings. With maneuvering valves.

## 8500 HP G.E. — C-3 OR VICTORY

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

## VICTORY SHIP AUXILIARY TURBO GENERATOR SET ROTORS

- 11** 300 KW 5965 RPM JOSHUA HENDY  
Turbine — 3H-69 Gear — 52269  
Turbine — 3H-52 Gear — 52252  
Turbine — 3H-62 Gear — 52262  
ALSO WESTINGHOUSE 2A & 5A SERIES

# - FOR T-2 VESSELS -

- 12** TURBINE: DORV-325M — 525 KW — 5645 RPM — 435 PSIG — 28" exhaust. REDUCTION GEAR: S-162 — form D — 5641/1200. A.C. GENERATOR: 500 KVA — 400 KW — 440/3/60 — 1200 RPM — 0.8 PF. D.C. EXCITATION GENERATORS: 75/55 KW — form AL — 110 volts DC. With new type amplydines.

## 538 KW WESTINGHOUSE T-2 AUXILIARY GENERATOR — COMPLETE

- 13** TURBINE: 538 KW @ 5010 RPM — 438 PSIG — 750°TT — 28 1/2" vacuum. GEAR: 5010/1200 RPM. A.C. GENERATOR: 400 KW — 450/3/60/1200 — 0.8 PF. DC EXCITER: 32.5 KW — 120 volts (variable voltage) — shunt — 4-pole — DC excitation 5 KW. ALWAYS WELL MAINTAINED BY MAJOR OIL CO.

## T-2 UNUSED G.E. MAIN PROPULSION STEAM TURBINE WITH ROTOR

- 14** 10-Stage — 435# — 720°TT — turbine complete with rotor — serial #109166 — 4925/5400 KW — 3600/3720 RPM — 28.5" vacuum.

## WESTINGHOUSE MAIN PROPULSION STEAM TURBINE WITH ROTOR

- 15** EX-CHEVRON VESSEL "MACGAREGILL" Shrouded—like-new condition. Will sell rotor separately. WESTINGHOUSE MAIN PROPULSION TURBINE EX"Pecos" — unshrouded — serial 2A-7733-2 type A

## UNUSED G.E. MAIN PROPULSION STATOR

- 16** Type ATB-2—serial #6978272. 2300/2370 volts — 60/62 cycles — 3-phase — 3600/3720 RPM — armature amps 1237/1315 — 4925/5400 KW — 1.0 PF. Westinghouse stator — from Ex "Pecos"

## WESTINGHOUSE 538 KW AUX. GENERATOR EXCITER ARMATURE

- 17** We have both types:  
110 KW — 32 KW — 5.5 KW  
110 KW — 28 KW — 5.5 KW

## 538 KW WESTINGHOUSE AUXILIARY TURBINE ROTORS

## WESTINGHOUSE T-2 TANKER MAIN GENERATOR COOLERS & MAIN MOTOR COOLERS

- 19** Reconditioned — with A.B.S. Units all ready to ship. Also G.E. Main Generator Coolers

## G.E. 525 KW AUX. GENERATOR EXCITER ARMATURE

- 20** 75-55 KW

## NEW STYLE AMPLIDYNE

- 21** 5LY148A2 — type A.M. — frame 605

## AUXILIARY GENERATOR ROTORS

- 22** G.E. aux. generator rotors — DORV-325M — for 525 KW turbo generator sets

## T-2 MAIN CARGO PUMPS

- 23** Ingersoll-Rand 6GT — 2-stage — bronze — 2000 GPM — 280' head

## LATEST DESIGN 5-SPEED FORCED DRAFT FAN MOTORS

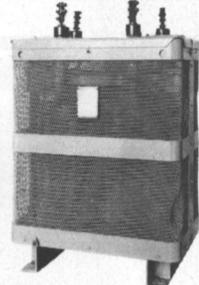
- 24** G.E. Model 5M505FE-1 — frame 5055—type M—440/3/60 — serial S.E.6731807. Controller available. (Complete with fan impeller)

## T-2 SHIPS SERVICE AIR COMPRESSORS

- 25** Worthington — 5 1/2 x 3 1/2 x 3 1/2 — VA2 — 20 C.F.M. — 100 lbs. — 5 H.P. Motors — 440/3/60 — 1750 RPM.

## WESTINGHOUSE DRY TYPE T-2 CARGO PUMP TRANSFORMERS

- 26** 200 KVA — single phase — 60 cycle 2300/450 volts — weight 3720 lbs. each. 4 available.



## G.E. PYRONOL OIL COOLED TRANSFORMERS

- 27** 200 KVA — single phase — 60 cycles — 2300/450 volts — 3 available.

## MISCELLANEOUS DRY-TYPE TRANSFORMERS

- 28** Lighting Transformers—15 KW— 450/120 volts Galley Power Transformers—15 KW—450/220 volts

## INGERSOLL-RAND 14,000 GPM MAIN CIRCULATOR

- 29** 14,000 GPM @ 25' head — model 24UCM — bronze — with 125 HP 440/3/60 580 RPM motor. 26" suction — 24" discharge. Can furnish with Westinghouse type CS frame B-876C or GE type KF vertical motors.



# PUMPS

## BRONZE T-2 TANKER STRIPPING PUMPS

- 30** 14x14x12 — 700 GPM at 100 lbs. Same pump available in steel for fuel oil transfer, etc.



## WESTINGHOUSE 200 H.P. CARGO PUMP MOTORS

- 31** 440/3/60 1750 RPM — 40°

## MISSION TANKER T2SEA2 CIRCULATING PUMP MOTOR

- 32** 150 HP — 440/3/60/590 RPM. Frame 6335 — type KF — 204 amps

## T-2 MAIN ROTOR

- 33** LARGE G.E. MAIN PROPULSION SCHENECTADY TURBINE ROTOR  
Turbine serial 77418 — reconditioned with certificate. Just out of Beth shop 1970



## T-2 MISCELLANEOUS, PUMPS ETC.

- 34** 10 HP Labour Self-Priming Bilge Pumps • Rudder 13 1/2" Rudder Stocks • Main Injection 3-Way Valve Main Condensate Pumps • Fuel Oil Service Pumps Magnablast Breaker • 1 Set New Bull Gear & Pinion for G.E. 525 K.W. Diesel Gen Model S-162 • 32", 24", 15" Rubber Expansion Joints • Mission Tanker Steering Gear Pumps

## TURBINE FIRE PUMPS — BRONZE

- 35** Worthington turbine — 440# — 448° — 3500 RPM — 75 HP — 15# back pressure — 750 GPM @ 125 lbs — 6" suction — 4" discharge.

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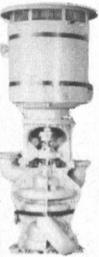
**NEW BLACKMER FUEL OIL TRANSFER PUMP**

36



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

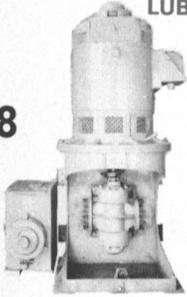
37



**UNUSED BRONZE FEED-WATER BOOSTER PUMPS**

220/237 GPM @ 144' head —  
2-stage — 1750 RPM with 30  
HP 440/3/60 motor control &  
spares. Built for USN

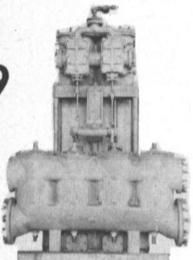
38



**LUBE OIL SERVICE PUMP**

Quimby-Rotex — size 6D —  
500 GPM @ 70 lbs — 6"x6"  
flange — 720 RPM. MOTOR:  
Allis-Chalmers — 40 HP —  
230 VDC — type EBV-147S —  
stab. shunt — 148 amps. Com-  
plete with starter and rheostat  
— designed originally for  
C-1MAV-1 vessels.

39



**WORTHINGTON 16"x14"x18"  
VERTICAL DUPLEX STRIPPING PUMP**

1400 GPM @ 110 PSI; suction  
lift 11.5 ft. Steam back pres-  
sure 15 lbs. Suction 14" —  
discharge 10" — steam 2 1/2"  
— exhaust 4". Overall width  
6' 8" — overall height 9' 1 1/2"  
— depth 3' 9 1/2" — approx.  
wt. 10,000 lbs.

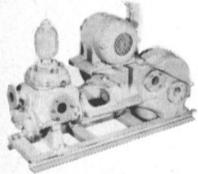
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**NEW WORTHINGTON VERTICAL  
SUBMERSIBLE BILGE PUMP**

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

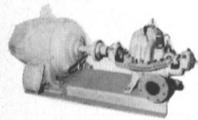
41



**MOTOR-DRIVEN GARDNER-DENVER  
RECIPROCATING BILGE PUMP**

50 GPM — 150 PSI — Model  
ALAXE — serial #106335.  
3 3/4" bore — 4" stroke — 2 1/2"  
suction — 2" discharge. 51"  
long — 21" wide — 21" high  
— weight 750 lbs. MOTOR:  
Diehl — 2.5 HP — 440/3/60  
— 1750 RPM — 3.53 amps.

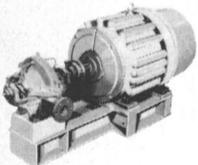
42



**GOULD FIRE AND BILGE PUMP**

Ex-LST — horizontal centrif-  
ugal — bronze — 4" suction —  
3" discharge — 250 GPM @  
100 PSI — 2200 RPM. MO-  
TOR: 30 HP — 230 VDC  
with magnetic starter.

43



**AURORA HEAVY DUTY  
BRONZE FIRE SERVICE PUMP**

Single stage — 2 1/2" suction  
— 2" discharge. 3000 RPM  
— 250 GPM. 100 lb. head.  
Impeller diameter 9 1/2". MO-  
TOR: Air cooled heavy duty  
25 HP Reliance T type ON-  
2S-2 1/2 230 VDC — 110 amps  
— stab. shunt.

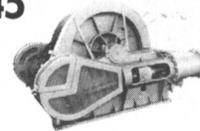
**DIESEL  
GENERATOR SETS**

44

**410 KW ENTERPRISE DIESEL  
GENERATOR SET**

Enterprise DSG-6 6-cylinder diesel engine driving  
Westinghouse generator. 250 volts DC — 1640  
amps — 650 RPM — shunt wound.

45



**AUTOMATIC TENSIONING 12X14 STEAM WINCH**

American Engineering. Drum  
diameter 24". Will stow 1500  
ft of 1 1/2" in 8 layers. Ca-  
pacity 1st layer: 20,000 lbs/  
100 FPM — 16,000 lbs/50  
FPM. Drum width 2' 6 3/4".  
Steam inlet 3" — exhaust 4".  
8' 4 1/2" wide over cylinders.  
Base 6' x 6' 3 1/2".

46



**16"  
BRASS  
PORTLIGHTS**

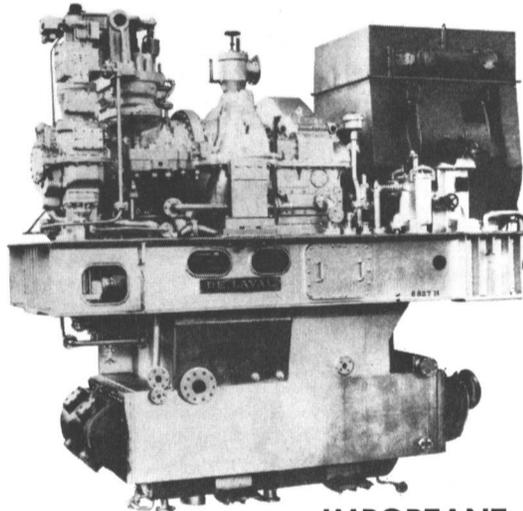
15" and 16" brass portlights.  
16" portlights are 3-dog type.

**MISCELLANEOUS**

47

**IF YOU'RE GOING TO JUMBO-IZE  
YOU CAN ECONOMIZE WITH THESE  
ALLIS-CHALMERS — DELAVAL  
1000 KW GEARED MARINE  
TURBO-GENERATORS**

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units — built to highest Navy stand-  
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brochure. You'll be glad you did...  
and money ahead!

**IMPORTANT INFORMATION**

DELAVAL TURBINE: 1442 HP — 10019 RPM — Class GJ-N — 9-stage — 10,000 RPM — 1050  
PSI — 950°TT — condensing steam rate 10.30 lbs. Typical serial number 652468. DELAVAL  
DOUBLE HELICAL GEAR: 10000/1200 RPM — Allis-Chalmers — 1000 KW — 450 volts — 3-phase  
— 60 cycle — 1200 RPM — 0.8 PF — static excitation — totally enclosed air-to-water cooling — tem-  
perature rise: Stator 130°C — Rotor 110°C — class H insulation — typical serial number 160615  
— type M.A.K.G. Complete with 525 sq.ft. condenser — 190 lbs/hr air ejector — oil coolers —  
strainer — piping & valves — generator switchgear — static excitation control — voltage regula-  
tor. Total weight of unit 40,300 lbs. OAL 12' 9" — OAW 6'. Turbo-generator height 5' 8" —  
total height of turbo-generator & condenser 12' 8". UNITS IN EQUAL-TO-NEW CONDITION.  
Originally designed for DLG Guided Missile Frigate Program. Installed only about 2 years,  
then removed and carefully re-boxed by U.S.N. at Bath Iron Works 1964-65. Navy in-  
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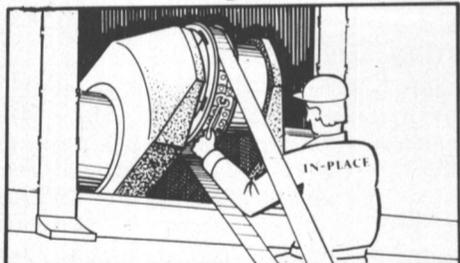
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## Catalog Details All BFG Industrial Hose Products

Every product in the extensive BF Goodrich line of industrial hoses is described thoroughly with a new 136-page color catalog available from the BFG Engineered Systems Division.

Over 100 different products are listed in the catalog's color-coded table of contents. Separate hose and coupling indices provide quick cross-referencing to match products with types of service recommended by BF Goodrich.

Information sections are included to advise customers about proper hose selection, BFG's eight basic hose construction methods, common hose ends and rubber compound properties.

Twelve pages are devoted to coupling selection and attachment. Thread data for couplings, technical data and BFG hose resistance to over 140 chemicals and compounds are chartered to facilitate tube specification.

According to W.R. Bartlett, division general sales manager-industrial products, "BF Goodrich has made over 200 significant hose design and production advancements through more than 100 years in the business. Without question, this catalog is the most complete hose and coupling selection guide we've ever printed."

For a copy of Industrial Hose & Couplings, write to W.R. Bartlett, BF Goodrich Engineered Systems Division, 500 South Main Street, Akron, Ohio 44318.



**NEW CHAIRMAN**—Melvin E. Lemmerhirt, left, vice president of Great Lakes Dredge and Dock Company, newly elected chairman of the board of directors of The New York Towboat & Harbor Carriers Association, is shown presenting a plaque to outgoing chairman of the board Robert J. Hughes, right, president of James Hughes, Inc., lauding him for "dedicated and effective services" as chairman since 1976, as William E. Cleary, center, president of the Association, looks on. Other officers reelected were Michael G. Lorenzo, treasurer; Thomas F. Horan, president of Horan Transportation Corporation, secretary, and Eugene J. O'Connor, assistant secretary. The Association represents over 40 companies operating tugboats, barges and shallow-draft motor-tankers on the waters of New York Harbor, Long Island, and the Hudson River.

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Kuwait:	Al Hamad Subsea Sces Tlx 2138 RAKAN
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Philippines:	Luzon Stevedoring Corp Tlx 7227649 RCA
Norway:	Arnulf L'Orsa A/S Tlx 11187 LORSA
Sharjah:	Hydrospace Divers Int Tlx 8135 HYDRO
Dubai:	Eggs Middle East Ltd Tlx 5961 EGGS
Japan:	Japan Phosmarine Inc Tlx 27274 DYNAMIC
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Venezuela:	CA CALINA Tlx 21356 BBCCS
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## Ocean Minerals Recovered From Floor Of Pacific By OMCO

The research and survey ship Governor Ray has completed its first survey and exploration cruise, and has recovered several thousand pounds of manganese nodules from 18,000 feet on the Pacific Ocean Floor, according to Ocean Minerals Company (OMCO), 465 Bernardo Avenue, Mountain View, Calif.

OMCO is developing technology to commercially mine the nodules, and will use the samples for continued processing tests and ore assay.

The Governor Ray is being used for a series of cruises to plot and sample the rich nodule fields between the Hawaiian Islands and Baja California. The nodules contain manganese, nickel, copper, and cobalt, and are so abundant that known ocean deposits could last for centuries.

Conrad G. Welling, OMCO vice president-programs, said: "Two types of areas are being explored by the Governor Ray. The first measures thousands of square nautical miles and is being surveyed to obtain general data on the characteristics of nodules and exact locations of the vast mineral reserves. The second survey concentrates on an area approximately 100 square nautical miles which has a dense population of nodules and is suited to tests of a mining system.

"Approximately 450 nodule samples were taken by free-fall samplers—torpedo-like objects which are dropped to the ocean floor and return automatically once the sample has been scooped. Data from such samples are used to determine the abundance, ore grade, metal content, and physical characteristics of the nodules."

Some of the free-fall devices were equipped with cameras and sediment samplers to gather additional visual and physical data on the ocean floor environment.

"Two-foot-square sections of the ocean floor (approximately 18 inches thick) will be recovered using a tripod-shaped device called a box corer. Additional visual data on nodule abundance and ocean floor obstacles are being gathered with a tethered camera that automatically takes still photos 18,000 feet below the surface. Data from these instruments will be used to provide information on the characteristics of the mine area. This in turn will provide information for the proper operation of the bottom miner which will travel on the ocean floor and gather nodules. The sediment is known to be extremely soft and can withstand only slight pressure in supporting objects such as a bottom miner," he added.

OMCO has leased the mining ship Glomar Explorer and plans to conduct initial development operations with a test miner later this year. At the start of these tests, the miner will be lowered more than three miles to the ocean floor from the Explorer's huge 200-foot by 74-foot floodable well. Thirty-foot sections of pipe will connect the miner and the ship, and lowering operations alone are expected to take a few days. After the test miner is on the bottom, it will sweep a pre-charted mining site to collect nodules and bring them through the pipe to the surface.

OMCO is a partnership formed in November 1977 by Ocean Minerals Inc. and Amoco Ocean Minerals Co., a subsidiary of Amoco Minerals Co., Chicago, Ill., which in turn is a subsidiary of Standard Oil Company (Indiana). Shareholders in Ocean Minerals Incorporated are: Billiton B.V., a member of the Royal Dutch/Shell Group; BKW Ocean Minerals B.V., a subsidiary of Royal Bos Kalis Westminster Group N.V.; and Lockheed Missiles & Space Co., a subsidiary of Lockheed Corporation.

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*This announcement appears as a matter of record only.*

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April 26, 1978

# Maintaining Design Performance In Marine Boilers

Thomas P. Mastronarde\*

The responsibility to maintain design fuel rates over the service life of a marine steam powerplant rests with the operator. With good plant management, this task is usually accomplished by a combination of frequent periodic adjustment of the equipment controlling powerplant efficiency, and by regular maintenance of major components.

Of the numerous monitoring points associated with main-propulsion boilers, the following are considered to be the most important parameters affecting powerplant efficiency as measured by the specific fuel consumption: excess-air fired, superheater outlet temperature, superheater outlet pressure, and stack temperature.

Other parameters, such as feed temperature and ambient air temperature, affect the boiler output and the cycle efficiency, but are not controlled by the boiler system.

Deviations from design excess air and boiler outlet pressure are governed by control systems which may be adjusted by the operating personnel. The superheater outlet temperature may also deviate from design through improper control or from deterioration of superheater surface, in which case the design temperature cannot be restored without cleaning or restoration of the component itself. The stack temperature reflects the overall cleanliness of the entire boiler, including heat-recovery surface, and cannot be adjusted with controls (assuming the design excess-air level is maintained).

**Excess-Air Deviation**—The achievable excess-air level for a given marine boiler is a function of furnace configuration, the amount of fuel fired per unit furnace volume, and the oil-burner characteristics. In general, the design value, specified by the purchaser, includes some margin for operation with slightly worn burner tips or with fuel-oil viscosities and atomizing steam conditions which are not quite optimum. The design excess-air level maintained by the combustion-control system must also include

margins for the following conditions:

1. Under steady steaming conditions, the combustion-control system may hunt cyclicly above and below the set point value by one or two percent excess air. Alternating torque loadings from the propeller, especially during pitching of the vessel, can also cause significant cyclic variations in the excess air maintained by the control system.

2. Under changing load conditions, such as maneuvering, sufficient margin on excess air must be provided to prevent smoking during the transient.

Flue-gas testing carried out aboard ship with the traditional ORSAT type of analyzer emphasizes the measurement of carbon-dioxide content of the flue gas, with oxygen and carbon monoxide determined to a lesser degree of accuracy because of the proportionally smaller amounts present. It is most desirable to measure the oxygen content of flue gas accurately since this parameter is not dependent on fuel composition, as is carbon-dioxide content. Excess-air values can be accurately determined from the oxygen content of the flue gas without any knowledge of the fuel composition, a definite advantage for shipboard monitoring.

The following procedure used by the author's company on several shipboard tests appears to be readily adaptable to periodic monitoring of the combustion-control system and burners by operating personnel:

1. Obtain an oxygen analyzer which can give continuous readings of oxygen content and can be readily calibrated with air.

2. Fabricate a portable gas-sampling probe from 1/4-inch diameter stainless-steel tubing by drilling small holes along the portion of the probe to be inserted into the gas stream.

3. Install a sampling penetration in the uptake ducting below the economizer or regenerative air heater. This may consist of a 1/2-inch pipe nipple threaded into the duct and fitted with a 1/4-inch O.D. compression adapter that is normally plugged.

4. When a periodic check of combustion-system performance is desired, the plug can be removed from the compression fitting, the probe inserted into the gas stream, and a continuous readout of oxygen content can be obtained from the portable analyzer. Excess air for a given oxygen con-

tent can be determined from a chart.

The amount of excess air fired in a boiler has an impact on the long-term material condition of boiler components related to thermal performance. In the superheater area, excess air is related to the rate of high-temperature corrosion of superheater tubing materials exposed to vanadium compounds.

In the economizer or regenerative air heater, the amount of excess air is related to the corrosion of heat-recovery surface exposed to sulfuric acid in the flue gas. Metal surfaces at temperatures below the sulfuric-acid dewpoint will condense concentrated acid onto the surface. In general, the lower the metal temperature is below the dewpoint, the greater the rate of corrosion. A reduction of excess air from 15 percent to 5 percent causes a reduction in sulfuric-acid dewpoint of about 10°F. Regenerative air-heater corrosion appears to be more definitely influenced by excess-air level so that failure to maintain design excess-air could produce a significant deterioration of air-heater performance, and specific fuel consumption, over a long period of time.

Aside from the long-term aspects of boiler component replacement, the amount of excess air has an immediate effect on both the boiler efficiency and the powerplant cycle fuel rate. Increasing the amount of excess air above the design value causes an increase in stack temperature, an increase in stack losses from the additional mass of heated gas leaving the boiler, and an increase in power consumption for the forced-draft fans. For an increase in excess air of 10 percent above design value (e.g., firing 20 percent excess air in a cycle with design excess air of 10 percent), the increase in specific fuel rate is approximately 0.65 percent. For a vessel with an annual fuel consumption cost of \$3,000,000, operation with excess air 5 percent above design level throughout the year would cost up to \$9,100 per year. This figure is based on the simplifying assumption that 95 percent of the fuel used annually is consumed at the full-power rating.

**Superheater Outlet Temperature Deviation** — Excursions in superheater outlet temperature can be caused by improper adjustment of the control desuperheater, if fitted, or by severe slag accumulation over a period of time.

Although the operator observes superheater outlet temperature on a continuous basis, the accuracy of the ship's instruments can reasonably be questioned. Remote temperature gages can easily be 30°F to 50°F (17°C to 28°C) out of calibration after months of operation. The technique used by the author's company during shipboard tests on vessels in service is recommended for use by the vessel's operators for checking and informal calibration over a wide range of temperatures.

Sheathed Chromel-Alumel (Hoskins Manufacturing Company) (Type K) thermocouple probes are connected by a short length of wire to a portable digital indicator (potentiometer). Several pocket-size indicators on the market are compatible with Type K thermocouples, have built-in reference junction circuitry, ambient compensation, rechargeable batteries, and cover a range of temperatures from -60°F to 2,000°F (-51°C to 1,094°C). These devices require no adjustment and give a reasonably accurate readout of the probe temperature at the flick of a button.

A small thermocouple probe, 1/8-inch diameter by 0.12-inch long (3 mm by 305 mm), responds readily to temperature transients and can be inserted into existing thermowells in the piping by temporarily disconnecting the ship's instrument probe. In this way, the control desuperheater setpoint may be adjusted periodically to maintain the proper design value of superheater outlet temperature at full load.

It has been observed that superheater outlet temperatures on some relatively new vessels are maintained 10°F to 20°F (6°C to 11°C) below design solely because of instrumentation error. A reduction of 20°F (11°C) from design value increases the specific fuel rate by almost 0.5 percent. For a vessel with annual fuel consumption of \$3,000,000, operating continuously with superheater outlet temperature depressed by 10°F (6°C) would cost about \$7,100 per year.

It should be noted that other conditions, such as severe slagging or burnout of refractory baffles, can cause reductions in steam temperature of 30°F and 60°F (17°C and 33°C). An additional technique for controlling severe slagging has been recently tested aboard ship. The addition of between 6 percent and 10 percent water to the fuel in a homogenizing process appears to

\*Mr. Mastronarde, senior engineer, C-E Marine Power Systems, Combustion Engineering, Inc., Windsor, Conn., presented the paper condensed here at the Symposium on Sustaining Design Thermal Performance of Ship Propulsion Machinery held at The United States Merchant Marine Academy, Kings Point, N.Y.

reduce the amount of slag adhering to superheater tubes. While a significant restoration of design steam temperature has been reported by using this technique, the results are considered preliminary and will undoubtedly be the subject of further intensive study.

**Superheater Outlet Pressure Deviation**—The design superheater outlet pressure maintained by the combustion-control system should be checked periodically with a calibrated pressure gage. Safety valves should be regularly maintained to avoid the necessity of operating at lower steam pressures to accommodate valves with a tendency to simmer or relieve prematurely.

A reduction in outlet pressure of 20 psi (1.4 bar) increases the specific fuel rate by 0.17 percent. For a \$3,000,000 annual fuel expenditure, this deviation costs about \$4,900 per year.

**Stack Temperature Deviation**—Although the temperature of flue gas leaving the heat-recovery equipment cannot be adjusted directly during operation, the stack-gas temperature is an important parameter to monitor in assessing thermal performance. In order to verify ship's instrumentation, it is useful to employ the same type of stack penetration for oxygen sampling for a periodic check of stack temperature. This test can be accomplished by inserting a ¼-inch diameter by 24-inch long (6.4 mm by 610 mm) sheathed Chromel-Alumel thermocouple probe into the stack at a location sufficiently far from the economizer or regenerative air heater to assure a representative temperature reading.

In general, if feedwater temperature to an economizer, or air temperature to a regenerative air heater, is assumed to be at the design value, the temperature of the flue gas leaving the heat-recovery device will depend on the material condition of the heat-transfer surface, or on the cleanliness of both the boiler and the heat-recovery surface. Thus, stack temperature can be considered to be an indicator of cleanliness or deterioration of material. It is not uncommon for stack temperatures to rise gradually 10°F to 15°F (6°C to 8°C) above the design value in the 12-hour period between scheduled soot blowing.

Operation with elevated stack temperatures increases the heat lost in stack gas above the design value and reduces the boiler efficiency. A long-term increase in stack temperature by 20°F (11°C) above the design value is reflected in an increase in ship's specific fuel rate of 0.45 percent. For a \$3,000,000 annual fuel expenditure, operation with stack temperatures an average of 10°F (6°C) above normal would cost \$6,500 per year.

**Conclusion**—The steam powerplant operator is faced with dozens of routine maintenance tasks involved in assuring continuous

availability of all the powerplant components. For the marine boiler in particular, a wide variety of activities are carried out on a regular schedule to ensure continuous operation and protect the material condition of components. These activities involve regular feedwater and boiler water analysis and treatment, sootblowing, cleaning of burner tips, periodic cleaning of firesides, adjustment of

safety valves, and combustion-control system adjustment. While many boiler operating parameters are logged and reviewed regularly, it is felt that closely observing the four primary thermal parameters outlined in this paper will enable the plant manager to maintain the original fuel efficiency of the powerplant through many years of service.

Coupled with the necessity for

monitoring thermal performance values is the need for simple, convenient methods for checking the ship's indicating devices. It is felt that knowledge of the true values of the important operating parameters described, combined with an insight into how much deviation in these parameters may affect the powerplant efficiency, will enable the operator to correct deviations in a cost-effective way.



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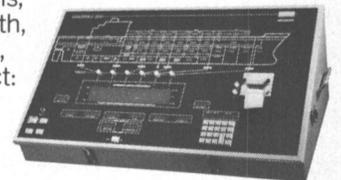
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**RAYTHEON**

## Newpark Shipbuilding Opens Gas-Freeing Facility In Houston

Newpark Shipbuilding & Repair, Inc. has opened a \$2-million barge-cleaning and gas-freeing facility on the Houston Ship Channel, capable of providing a wide range of vessel-cleaning services with extensive environmental safeguards.

John W. Sansing, president of Newpark Shipbuilding & Repair, said the facility represents the most advanced state-of-the-art, both for cleaning and ensuring maximum environmental protection. He said the plant complies fully with all existing safety and environmental regulatory standards.

The facility is located on Brady Island in the Houston Ship Chan-

nel, about one mile below the turning basin in the Port of Houston, Texas.

The plant is basically a dock-side facility where units to be gas-freed are brought alongside and cleaned by any of several appropriate methods.

In addition, it allows Newpark Ship with its five haul-out facilities to provide a full range of services to its customers.

One of the facility's environmental safeguards provides for equipping all storage vessels containing light hydrocarbons capable of escaping with overhead condensers so that vapors are not released in the atmosphere. Lighter, unstable hydrocarbons are burned in a smokeless flare.

Mr. Sansing said water for rinsing will be totally purified before being discharged or recycled.

Newpark Ship is a wholly owned subsidiary of Newpark Resources, Inc., an energy services company listed on the New York Stock Exchange.

## J. Ray McDermott & Co. Building Two 6,000-HP Oceangoing Tugs

Louisiana Marine Tugs Corporation, 1125 First Avenue (P.O. Box 624) Harvey, La., has applied for a Title XI guarantee to aid in financing the construction of two 6,000-horsepower oceangoing tugs.

The applicant owns and operates vessels used primarily in the offshore oil industry in the Gulf of Mexico. The new barges, to be named LAMMCO IV and LAMMCO VI, are also designed to be used in more hostile environments, such as off the East Coast and Alaska. In addition to the offshore oil industry, the vessels will be used in regular ocean towing, the applicant indicated.

J. Ray McDermott & Co., Inc., New Orleans, La., was awarded the contract to construct the two vessels.

The Title XI guarantee would be for approximately \$4,870,383, which represents 87½ percent of the estimated actual cost of the vessels.

## Heavy Plate Punching Brochure Available From W.A. Whitney

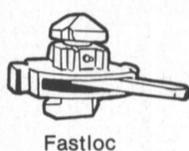
W.A. Whitney Corp., Rockford, Ill., an Esterline Company (NYSE), a leading heavy-plate fabricating machinery manufacturer, recently released a new brochure on their HEVI-Plate Duplicators.

The new brochure has been expanded to include the new Model 7130-60 Duplicator. This new 100-ton heavy-plate duplicating press features a 30½-inch throat, and has the capacity to fabricate plates from 3/16-inch to 1½-inch thick and up to 30 inches wide by 60 inches long. Holes up to 1½-inch diameter can be punched.

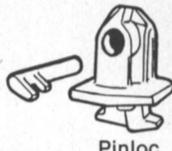
This equipment is ideal for miscellaneous plate fabrication. Costly layouts or cardboard templates used in conventional fabrication of plate parts are not required.

For your free copy of this brochure, write to James J. Henry, W.A. Whitney Corp., 682 South Race Street, Rockford, Ill. 61105.

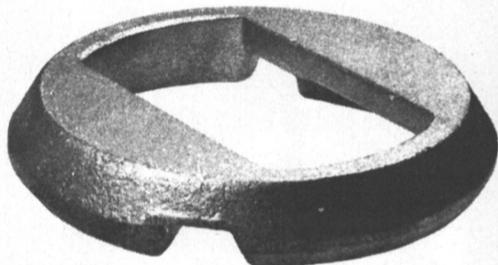
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## Palmer Industries, Inc. Formed For Container Repair And Storage

The formation of Palmer Industries, Inc. has been announced by **Clifford M. Palmer**, chairman of the board.



Clifford M. Palmer

The new firm, according to Mr. **Palmer**, will offer the Port of New York-New Jersey the latest technology in chassis and container repair. Palmer Industries' new facility, located at 8 Lister Avenue, Newark, N.J., has seven fenced-in, paved acres for the storage of containers and chassis, and 60,000 square feet of covered shop area.

The plant, now fully operational, is equipped with the most modern welding machines, container stackers and associated equipment to fully repair and store all types of chassis and dry or refrigerated containers.

Mr. **Palmer** also announced the appointment of **Frank L. Curreri Jr.** as president of the new firm, **August Ambrose** as executive vice president, and **Richard Guido** as vice president-operations. Mr. **Curreri** brings more than 30 years of container repair and related maritime experience to the company.

Additional information can be secured by writing to **Clifford Palmer**, Palmer Industries, 8 Lister Avenue, Newark, N.J. 07105.

## SNAME New York Section Announces New Officers For 1978-1979 Season

The New York Metropolitan Section of The Society of Naval Architects and Marine Engineers recently announced its officers and executive committee members for the 1978-79 season. Officers and committee members are as follows: Officers—**David A. O'Neil**, chairman; **Dr. Walter M. Maclean**, vice chairman, and **Eric E. Lithen**, secretary-treasurer; Executive Committee—**Allen Chin**, **John C. Daidola**, **Nicola F. Pergola**, and **Neil E. Reddy**; Standing Committee Chairmen—**Joseph D. Connors**, Papers Committee; **Capt. Moses W. Hirschowitz**, Membership Committee; **John Higgenbotham**, Meetings Committee, and **Steven E. Sabo**, Publicity and Public Relations Committee; Section Representatives—**Arnold M. Stein**, Section Representative to National Sections Committee, and **William H. Garzke Jr.**, Section Librarian.

## Laborde Named To Head New Orleans Office Of Marsh & McLennan, Inc.

**E. Theodore Laborde**, vice president, has been appointed head of the New Orleans, La., office of Marsh & McLennan, Incorporated, one of the nation's leading insurance brokers, and **Donald L. Pesquie**, vice president, has been named deputy manager.

Mr. **Laborde** succeeds **John B. Mead**, a senior vice president and

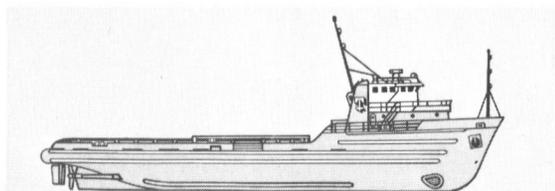
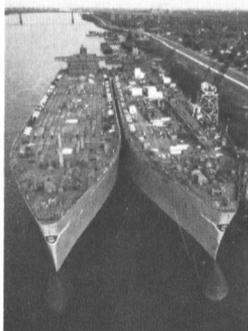
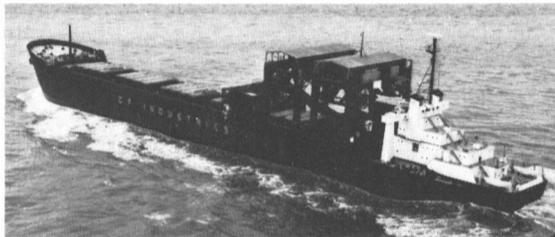
founder of the New Orleans operation, whose new assignment will be to develop sales and marketing programs relative to major clients of Marsh & McLennan's 11 offices in eight southeastern states, including Louisiana. Mr. **Mead** will continue to be based in New Orleans.

A native of Marksville, La., Mr. **Laborde** joined Marsh & McLennan in 1962, was appointed an assistant vice president in 1966 and elected a vice president in 1969.

He is a graduate of Georgetown University.

Mr. **Pesquie** joined Marsh & McLennan in 1960, and was elected a vice president in 1969. He is a lifelong resident of New Orleans, and graduated from Southeastern Louisiana University.

Marsh & McLennan, Incorporated is a principal subsidiary of Marsh & McLennan Companies, Inc., listed on the New York, Midwest and Pacific Stock Exchanges. Its ticker symbol is MMC.



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Avondale never limits its interest in ship construction by type, size or quantity. Our design capability has been developed as a service to the industry for the development of new ship designs, and to review existing designs for possible improvements. We can meet all of your requirements.

## Unique Capabilities

Avondale's facilities are among the most modern in the United States. We are extremely proud of the fact that many unique construction techniques have been developed in response to challenges from the industry for certain types of vessels. But . . . the real reason for Avondale's capabilities is its people and their dedication to being the nation's best shipbuilders.

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**Cummins KT-2300-Marine Diesel  
Makes North American Debut**

The M/V Ocean Marauder, recently launched in the waters off Vancouver, British Columbia, Canada, is the first North American fishing vessel powered by a Cummins KT-2300-M diesel engine.

An 86-foot seiner built by John Manly Shipyards of Vancouver for Ocean Fisheries and Wishing Star Fisheries, also of Vancouver, the Ocean Marauder cruises along the Pacific Northwest Coast, fishing for salmon and herring.

The fish holds are styrofoam lined and fiberglass covered to insulate and protect the catch, and a built-in bubbling system circulates slush ice and brine uniformly through the tanks. The Ocean Marauder provides

comfortable living quarters for Capt. John Lenic and his five-man crew. Fuel and freshwater tanks have capacities of 3,400 and 1,730 gallons, respectively. The sleek steel-hulled vessel's 13-foot molded depth and 24-foot beam accommodates four fish holds, with a total volume of 5,600 cubic feet and catch capacity of 160 tons.

On-deck and bridge equipment includes a 48-inch by 17-inch two-motor purse main winch, manufactured by Hytac Ltd., a Pilkington Blacksmith's net drum, and various boom and line winches by Gearmatic Co. Electronic components onboard, including radar, radio and depth finder units, are manufactured by Wagner.

The Ocean Marauder's compact KT-2300-M V-12 turbocharged diesel, with a continuous duty rating of 700 bhp (522 kw) at 1,800

rpm, drives a three-blade 64-inch by 66-inch Western stainless-steel propeller in a Kort-type nozzle. Power is provided through a Twin Disc MG-527, 5.17:1 gear. The low surface-area-to-volume ratio due to large cylinder displacement along with improved manifolding, short injection period and improved breathing, all make the KT-2300-M one of the most fuel-efficient marine diesels available in its size and horsepower range. For ease of maintenance and serviceability, the Cummins K engine also includes internal fuel and oil lines, and individual cylinder heads.



The Ocean Marauder debuts the first Cummins KT-2300-M diesel engine to power a commercial fishing boat in North America, as it starts sea trials off Vancouver.

Cummins Diesel Sales of B.C. Ltd., North Burnaby, B.C., supplied the KT-2300-M engine and Twin Disc marine gear, as well as the Cummins NT-495 marine auxiliary engine and a Cummins V-555-M rated at 185 hp continuous duty for the seine skiff. The NT-495 operates the vessel's generator, hydraulic system and bow thrusters.

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**READY FOR SERVICE**—Paceco, Inc., a subsidiary of Fruehauf Corporation, Alameda, Calif., recently delivered the first of two new 30-long-ton Rubber Tired Transtainer® cranes ordered by International Transportation Service, Inc., Long Beach, Calif. The Transtainer crane, equipped with automatic steering, an anti-sway system, and telescopic spreader, which will handle 20-foot and 40-foot ISO containers, was delivered to the Port of Long Beach terminal. The delivery of the Transtainer crane makes a total of five Paceco terminal cranes now in use by I.T.S. at Long Beach. Another Transtainer crane, the sixth at the terminal, is scheduled for service imminently. It also has the same advanced engineering features of the fifth Paceco Transtainer crane. Both cranes were manufactured at Paceco's Gulfport, Miss., plant.

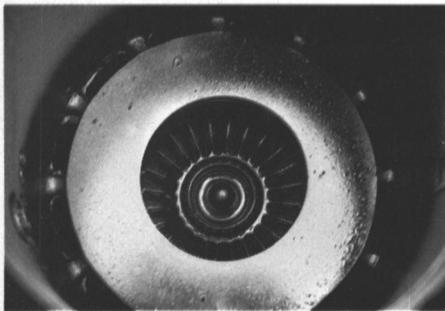


A. E. "Bud" Dacus finds Caprinus R Oil 40 helps keep EMD-567C's in top condition. "Works equally well in my Detroit Diesel 6-71 auxiliary diesels," he says.

## "I'm impressed—Shell's Caprinus® R Oil 40 keeps my EMD's in better condition than any other oil I've used in 20 years."

**Says A. E. "Bud" Dacus, Chief Engineer of the M/V Crescent City since her launching in 1958.**

"We've tried a good many engine oils in the Crescent City over the past 20 years," continues Mr. Dacus, veteran engineer for the Sioux City-New Orleans Barge Company of Hartford, Illinois.



Absence of carbon or ash deposits on piston undercrowns demonstrates outstanding stability of Caprinus T and Caprinus R Oils.

"Until recently, we considered Shell's Caprinus\* T Oil 40 the best. It kept our EMD's in fine condition. But Caprinus R Oil 40 looks even better."

Mr. Dacus made his comments during a routine teardown of his EMD 16-567Cs after 18,875 hours of service. The engine photographed had been on Shell's Caprinus T Oil and switched to Caprinus R Oil for the last 5,000 hours.

### Exceptional Cleanliness

"I never saw an engine look so clean after 5,000 hours on any oil," adds Mr. Dacus. "It looked even cleaner at 18,875 hours than at the 13,000 hour mark. Top decks had just a light oil film. Intake ports were wide open. Practically no sludge in the sump. Minimum wear on rings."

### Guards against corrosion

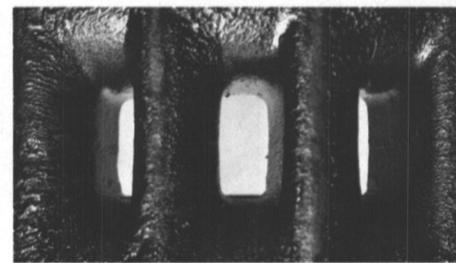
Caprinus R Oil 40 is higher in initial

alkalinity than Caprinus T Oil (10.2 TNB-E compared to 7.5) and retains effective alkalinity in extended high-stress service. It neutralizes combustion acids and guards against corrosive wear of rings and liners over long periods.

Filters frequently last longer, too. Caprinus R Oil's dispersant additive system helps keep insolubles in suspension, prevent heavy deposit buildup. Result — the possibility of significantly extended filter service life, an important maintenance saving.

### The switch is on to Caprinus R

Top engine performance is why nearly 100 towboats, including ten from the Sioux City-New Orleans Barge Company, have already switched to Shell's Caprinus R Oil. Look into this high alkalinity engine oil for your vessels. It could mean important savings in operating costs for you!



Intake ports for an EMD 16-567C cylinder are completely free of deposits after more than 13,000 hours on Caprinus T Oil and 5,000 hours on Caprinus R.

Send for technical bulletin describing the properties and applications of Caprinus R Oil 40 in medium-speed diesels. Just write: Shell Oil Company, Manager, Commercial Communications, One Shell Plaza, Houston, Texas 77002.

**Come to Shell for answers**



\*Caprinus is a trademark and is used as such in this writing.

## Arnessen Marine Systems Appoints William Kuenzel

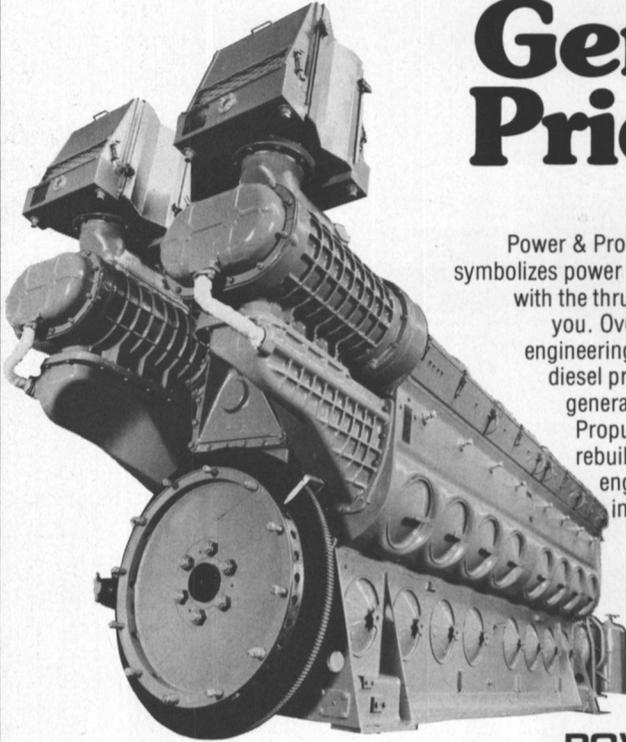
According to an announcement by Robert Izmirlan, executive vice president of The Arnessen Corporation, William R. Kuenzel has been appointed as sales manager for Arnessen Marine Systems, Inc., New York, N.Y.

Mr. Kuenzel has an extensive marine background. Most recent-

ly, he was sales manager at Young Engineering in New Orleans, La., and prior to that, he was an area manager for ITT Decca Marine.

A graduate of New York University's Business School, Mr. Kuenzel spent five years with the North American Air Defense Command in a technical capacity. He is a member of The Society of Naval Architects and Marine Engineers.

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## Harland And Wolff Ltd. And M.A.N. Enter Agreement



Signing for the new company, Harland-M.A.N. Engines Limited, are from left: the Right Honorable John D. Concannon, M.P., P.C., Minister of State of Northern Ireland; Dipl.-Ing. Adolf Schiff, member of the board of management of M.A.N., Maschinenfabrik Augsburg-Nurnberg AG; Sir Brian Morton, chairman of Harland and Wolff; Ronnie Punt, managing director of Harland and Wolff, and (standing) Warner Knapp, sales department of M.A.N.

Harland and Wolff Ltd. of Belfast, Northern Ireland, and M.A.N. (Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft) of Augsburg, in the Federal Republic of Germany, have entered into an agreement covering the production and sale of medium-speed engines of M.A.N. design.

A new company, named Harland-M.A.N. Engines Limited, is being registered in Belfast and will be responsible for marketing and after sales service of all engines of M.A.N. design produced in Belfast under the provisions of a license agreement signed between M.A.N. and Harland and Wolff Ltd. Both parent companies have a substantial investment in Harland-M.A.N. Limited.

The purpose behind the estab-

lishment of the new company is to provide Harland and Wolff Ltd. with information for the production of medium-speed diesel engines and components and to provide M.A.N. with access to the U.K. market and other countries.

The new range of engines to be built by Harland and Wolff Ltd. will augment and be complementary to the diesel and steam marine propulsion units which have traditionally comprised the greater proportion of the work at the Belfast engine works. The M.A.N.-type four-stroke engines, which cover an output range from approximately 1,500 hp (1,100 kw) up to 32,000 hp (24,000 kw) are suitable for both main and auxiliary marine diesel installations and for stationary powerplants.

Harland and Wolff Ltd. has one of the largest and best equipped shipyards and engine works in Europe. The company was founded in 1853, and thus has a long tradition in shipbuilding and marine engine building. Harland and Wolff Ltd. employs approximately 9,000 persons. Last year, it had sales of some £65 million.

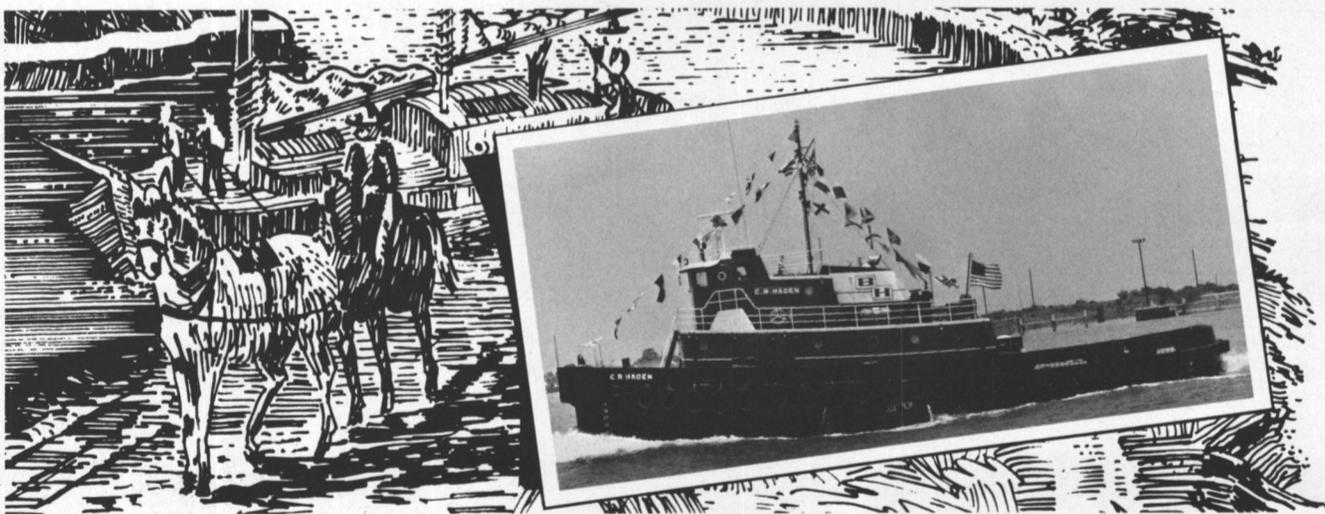
M.A.N. is one of the most outstanding mechanical engineering companies in Europe, with an annual turnover of some DM 4,800 million in 1976-77. The M.A.N. group employs approximately 46,000 persons.

## Frank Miller Elected President Of IAGLP

Frank E. Miller, director of seaport for the Toledo-Lucas County Port Authority, has been elected president of the International Association of Great Lakes Ports (IAGLP) for 1978-79.

The association, which includes 16 U.S. and five Canadian port members, elected Mr. Miller at its annual meeting in Toronto.

Walter J. Clemens of the Lakehead Harbour Commission in Thunder Bay, Ontario, has been chosen to chair the group's Canadian section.



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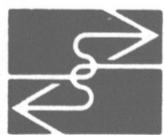
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**Dates Set For  
International Symposium  
On Marine Salvage**

The Maritime Association of the Port of New York and the Marine Technology Society have announced plans to sponsor an International Symposium on Marine Salvage to be held in New York City next year.

The conference, scheduled for

October 1-3, 1979, at the New York Hilton Hotel, will bring members of the worldwide shipping, salvage, insurance, government and maritime law communities together for a three-day meeting to discuss all aspects of marine salvage.

The chairman of the conference's Executive Steering Committee is Capt. W.F. Searle Jr., chairman of the Marine Technology Society Committee on Sal-

vage and Diving. Other members of the Steering Committee are Capt. Hugh Spicer, Mobil Shipping and Transportation; John L. Sullivan, president, Smit International; Edward C. Kalaidjian, partner in the law firm of Thacher, Proffitt and Wood; Thomas A. Fain, president, American Institute of Marine Underwriters; George Emmerson, president, The Salvage Association, Ltd.; Thomas Livingstone, vice chairman of

the board, Frank B. Hall and Co. of New York, Inc., and Richard Jaeschke, president, United States Salvage Association.

Attendance will be limited to 1,000. For more information on the conference, contact the Maritime Association of the Port of New York, 80 Broad Street, New York, N.Y. 10004.

**Worthington Pump  
Appoints Trevor Layne**

Trevor A. Layne, Summit, N.J., has been appointed manager of Energy and Industrial Marketing at Worthington Pump's Harrison, N.J., Engineered Pump Division.



Trevor A. Layne

In his 14 years with Worthington, Mr. Layne has held several responsible positions, both in the USA and Europe. Most recently, Mr. Layne was manager of Industrial Marketing, Harrison. Prior to joining Worthington, Mr. Layne gained fluid handling expertise in the petroleum refining and petrochemical industries. Mr. Layne is a graduate of Birmingham University (U.K.) and has a degree in chemical engineering.

Worthington Pump is the world's largest pump company, with 21 manufacturing locations in 13 countries. Its U.S. facilities are located in Harrison and East Orange, N.J., Taneytown, Md., and Shawnee, Okla. They manufacture pumps for the electric utility and public works, petroleum, chemical and petrochemical, marine, agricultural and general industries.

**Johnsen Named Manager  
For CAORF Simulator  
Located At Kings Point**

ADI Transportation Systems, a Grumman company which develops computer systems for the aviation and maritime industries, has named James J. Johnsen operations manager for the Computer Aided Operations Research Facility (CAORF).

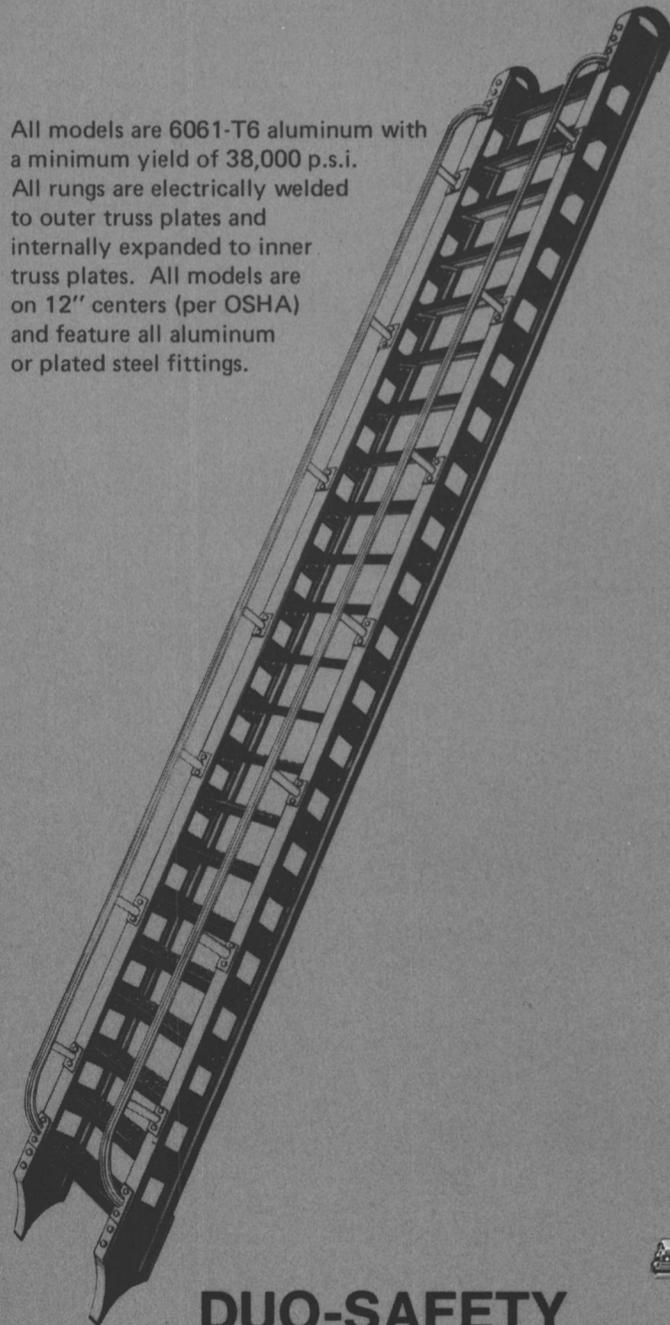
Located at Kings Point, N.Y., CAORF, the world's most sophisticated maritime simulator, is operated by ADI Transportation Systems for the Department of Commerce's National Maritime Research Center.

Mr. Johnsen, who was most recently deputy manager of operations, succeeds Sol Tenenbaum, vice president of ADI and now technical consultant for CAORF.

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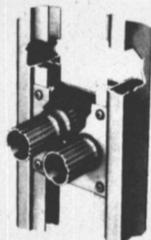
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or without  
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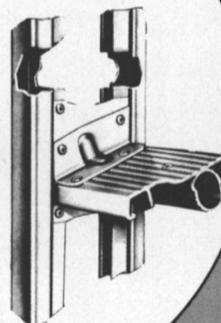
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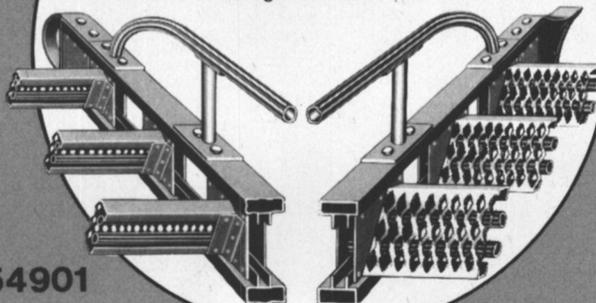
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## Halter Marine Delivers Two Supply Boats To Tidewater

Halter Marine, Inc. of New Orleans, La., has delivered the Jones Tide and the Laughlin Tide, two identical supply vessels, to their owner, Tidewater, Inc., New Orleans.

Each vessel has an overall length of 180 feet, a 40-foot beam, a 14-foot draft, and a normal operating draft of 11 feet. Their normal displacement is 605.33 long tons.

Both are powered by two Caterpillar D-399 engines producing 1,090 horsepower each at 1,225 rpm. They swing 76-inch-diameter stainless-steel four-bladed propellers which are driven by two ABS Grade 2, 7½-inch-diameter forged-steel propeller shafts.

Free-running speed is approximately 12 knots.

Each vessel contains a bulk mud system with a total capacity of 4,000 cubic feet of dry bulk mud, and a liquid mud system with a capacity of 1,300 barrels of liquid mud.



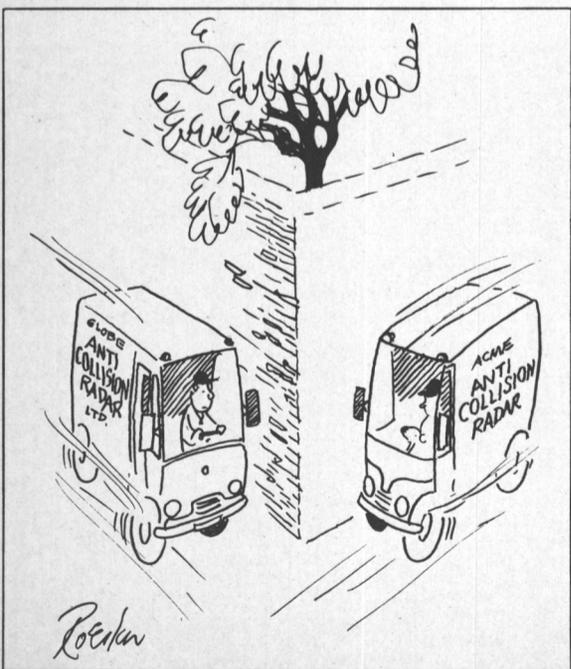
The Jones Tide and her sistership, powered by Caterpillar diesels, have a free running speed of 12 knots.

The Jones Tide and Laughlin Tide are each equipped with two General Motors 8V71 diesel engines driving 125-kw generators. They are fitted with two 2,000-pound anchors with a total of 1,080 feet of 1¼-inch high-strength steel link chain.

Each vessel is also equipped with a Murray Tregurtha bow thruster for improved maneuverability during loading and off-loading.

They are ABS classed, Maltese Cross, A-1, AMS full ocean towing, carry Panama Canal and Suez Canal admeasurement certificates, and are U.S. Public Health approved.

The Tidewater vessels were built at Halter's Moss Point, Miss., Division, one of 10 shipyards owned and operated by Halter in the Southeastern United States. Halter is the world's largest builder of supply vessels for the offshore oil and gas industry.



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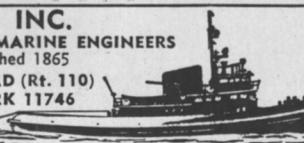
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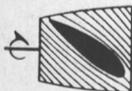


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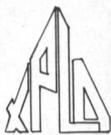
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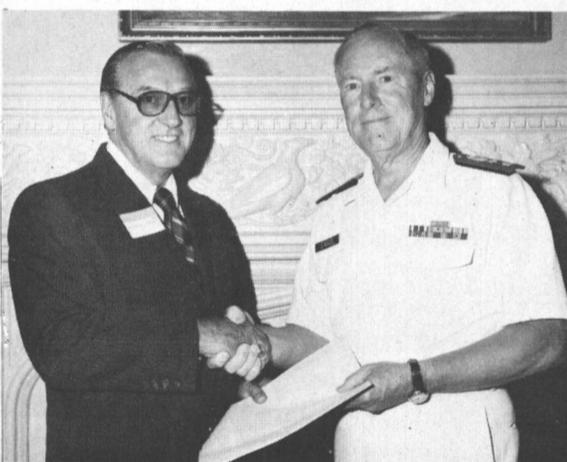
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## Cammell Laird Opens Ship Production Line

A new, large enclosed ship production facility has just been officially opened in England by Cammell Laird, part of the state-owned British Shipbuilders group, with headquarters on the River Mersey. Opening ceremonies were performed by Princess Anne, who by pressing a button lifted the keel section onto the slipway of the facility, which it was said could build vessels much like squeezing toothpaste out of a tube. The first ship under construction is a Royal Navy destroyer, but ships as big as 130,000 dwt could be manufactured in the enclosed area.

Costing £33 million (\$60 million), the plant uses an extruding technique whereby ships under construction are progressively jacked down the production line onto a steeply sloping launch slipway. Prefabricated units weighing as much as 250 tons are assembled on the line and gradually moved down as further sections are added. On the slipway, the superstructure is added and the ship outfitted.

To maintain factory conditions, the gable through which the vessels are extruded can be sealed by large sliding doors 26 meters high (about 85 feet), adjustable to the width of the vessel, and guillotining-type doors adjustable to the height of the vessel, above the slipway. Vertical access is achieved by escalators and transverse access across the vessel by moving bridges.



**GULF ASSISTANCE GRANT**—The Kings Point Fund of the U.S. Merchant Marine Academy Alumni Association has received a \$2,000 Assistance Grant from the Gulf Oil Foundation. Rear Adm. Arthur B. Engel, USCG (ret.), right, accepts the Gulf Oil Foundation Assistance Grant from Arthur Ernst at the Academy in Kings Point. Fund officials said the grant would be used to support midshipman programs at the Academy, such as the sailing team, the regimental band, a student loan program and athletics. The purpose of Gulf Assistance Grants is to further projects by colleges and universities. At the Academy, the programs which the Gulf grant will help underwrite receive no appropriated federal funds.

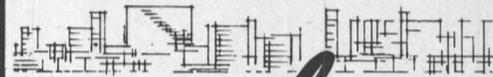
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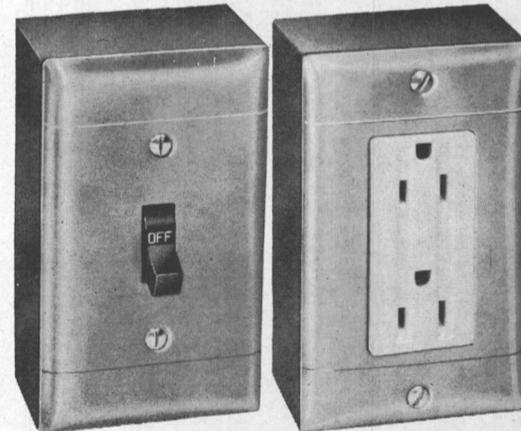
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## ASNE And SNAME Members Tour Long Beach Naval Yard Complex



Shown, with the USS Tarawa-LHA-1 in the background, are left to right: Lt. (jg) Alan W. Lockwood, USN, ship superintendent; Lt. Kenneth M. Smith, USN, ship superintendent; Comdr. Richard J. Kinnear, USN, assistant repair officer, and Ensign Debra L. Deacon, USN, ship superintendent.

The June meeting of the Long Beach-Greater Los Angeles Section of The American Society of Naval Engineers was held jointly with the Los Angeles Metropolitan Section of The Society of Naval Architects and Marine Engineers.

The more than 160 participants who were members of each or both Societies, along with their families and invited guests, convened at the Allen Center Officer's Club at the Long Beach (Calif.) Naval Station where they boarded buses for a "drive-through" tour of the Long Beach Naval Station and the Long Beach Naval Shipyard complex. Each bus had a tour guide who pointed out various buildings, berths, drydocks, ships, etc., and one of the outstanding landmarks viewed was the world's largest self-propelled floating crane, YD-171. This crane is one of four built at Bremerhaven, Germany, during World War II at an estimated cost of \$3.5 million each, and captured by the British at Kiel in 1945. Of the four, one was sunk at Hamburg, one capsized in the English Channel as the British were attempting to move it to their homeland, one was assigned to the Russians, who moved the partially completed crane overland to Danzig, and it has not been heard of since, and the last one was very carefully handled in transiting the Atlantic, Panama Canal, and the final leg up the Pacific Coast to Long Beach.

The crane is of the level luffing type with a lifting capacity of 386 tons at a radius of 114 feet. The hull is fitted with three electrically driven, vertical axis, variable-pitch propellers, giving her a maximum speed of over 6 knots, and by varying the pitch individually on the three thrusters, the crane can be moved omni-directionally for any desired orientation. In 1969, she was repowered from 725-hp motors to 1,200-hp diesel engines driving 960-hp electric motors at a cost

of \$318,000, and is maintained in an active status at all times. She is truly a beautiful piece of machinery and has served well in both Naval and commercial lifting assignments over the past some 30 years.

The tour proceeded to alongside the USS Tarawa-LHA-1, where the buses unloaded the group for the tour of the newest and most versatile amphibious warfare ship in the U.S. Navy. Small groups were guided through the ship by men of the ship's crew, and to many of the Society members it was a much more familiar and meaningful visit than one usually experiences on such a tour. Many had participated in the design, and more than just a few held positions of considerable responsibility during the conceptual and design phases of the ship's evolution. Even though the physical ship was built in Pascagoula, Miss., she was conceived, developed and designed in the Greater Los Angeles area.

The USS Tarawa combines the functions and payloads of four amphibious force ships in that she carries helicopters, landing craft, tanks, jeeps, cargo and troops. Her flight deck extends the full 820 feet of her length, permitting simultaneous operation of nine helicopters. She also has a very large "wet well deck" in her stern which allows docking landing craft within the hull where they may be loaded with men, tanks, trucks, jeeps or cargo at the same time that similar materiel is being deployed by the helicopters up topside. The movement of materiel within the ship from the storage areas to the flight deck and the "wet well deck" is accomplished by means of an elaborate system of conveyors, elevators and inclined ramps, affording her the capability of almost single-handedly conducting landing force operations.

Her electronics and communications systems are both extensive and versatile, and

have as a heart of the electronics a system called Integrated Tactical Amphibious Warfare Data Computer System which, in addition to keeping track of the landing forces after leaving the ship, also tracks the enemy targets ashore. With this system the computer can direct, aim and fire the ship's guns and missiles, or can direct other supporting ships to do so. She can also maintain both air and surface traffic control for her own helicopters and landing craft and additionally those of the combat air patrols and the task force supply ships.

She has extensive medical facilities which include two main and two emergency operating rooms, two X-ray rooms, a blood bank, laboratories, and hospital wards with 300 beds, all staffed with competent doctors, nurses, technicians, specialists and corpsmen.

Fleet Admiral Chester W. Nimitz once said "The U.S. Navy's errands of mercy have saved more lives than all its guns have destroyed," and the USS Tarawa is by far better suited than any other Naval vessel to sustain this tradition. No matter what the disaster—be it typhoon, earthquake or hurricane—she has the capability to provide food, clothing, shelter, medical care, communications and transportation to aid the victims.

On completion of the inspection of the USS Tarawa, the group again boarded the waiting buses to return to the Allen Center where a no-host buffet luncheon was served.

### Matson Names McClelland To Post In Hawaii

Joseph J. McClelland, a Matson Navigation Company vice president in San Francisco, Calif., has been named assistant area manager-Hawaii, R.J. Pfeiffer, president, announced.

Mr. McClelland, a retired Coast Guard admiral, joined Matson in February as a vice president and director of corporate development. He retired as Coast Guard Commander, Pacific Area, in San Francisco in 1976 after 36 years of service, including a tour as superintendent of the Coast Guard Academy, New London, Conn.

### Seatrains Lines Sells Interest To Dodwell

Completion of the sale of a 26 percent interest in its Pacific Container Division to Dodwell and Co., a wholly owned subsidiary of Inchcape and Co. Ltd., has been announced by Seatrain Lines, Inc.

Forming a new joint venture that will operate Seatrain's Pacific container service between the U.S. West Coast and the Far East, Dodwell will pay the carrier approximately \$12 million, plus an additional payment of up to \$5 million, depending on the division's future financial performance.

Seatrains will control the other 74 percent of the new company, which will continue to operate as Seatrain Pacific Services. The division has seven containerlines in the West Coast-Far East trade.

A tentative agreement with Dodwell, which has been acting as Seatrain's Japan and Hong Kong agent for some years, was first announced last May.

Dodwell's parent company, Inchcape, is a multinational corporation which recorded net earnings of approximately \$28.6 million in 1976. Other subsidiaries of the company are involved in ship operations, forwarding, lightering, port operations, marine and general engineering, commodity dealing, insurance brokering, and other businesses.

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MR

## General Dynamics Names Lennox General Manager Quincy Shipbuilding



Joseph H. Lennox

Joseph H. Lennox has been named general manager of General Dynamics Quincy Shipbuilding Division, Quincy, Mass.

Mr. Lennox, who has over 21 years of shipbuilding experience, joined General Dynamics at Quincy in 1973, and most recently served as assistant general manager of the division, with primary responsibility for construction of the liquefied natural gas (LNG) tankers being built there.

A native of Belfast, Northern Ireland, Mr. Lennox attended the

College of Technology, Queen's University there. In 1957, he joined Davie Shipbuilding Ltd., Quebec, Canada, where he held a number of increasingly important management positions including general superintendent.

Peter J. Gwyn, who has been acting general manager of the Quincy Division since October 1977, has been named general manager of the division's Charleston, S.C., Facility, with responsibility for construction of the 120-foot-diameter spherical aluminum cargo tanks for the Quincy LNG ships. He will also be responsible for development of additional major business for the facility.

A native of Kingsheath, England, Mr. Gwyn attended The Royal Military College, St. Jean, Quebec, The Royal Naval College, Greenwich, England, and The Quebec School of Naval Architecture. From 1953 to 1961, he served in the Royal Canadian Navy, rising to the rank of lieutenant. In 1961, he joined Davie Shipbuilding Ltd., Quebec, and was assistant general manager there when he joined General Dynamics at Quincy in 1973. From 1973 to

late 1977, he was assistant general manager at Quincy.

Constantin Hatzis, who has been general manager of the Charleston Facility since October 1977, will return to Quincy with major responsibilities in the LNG Ship Construction Program.

During the past year, the Quincy Shipbuilding Division has delivered three of the huge 125,000-cubic-meter liquefied natural gas tankers and holds contracts for seven more.

## TTT Ship Agencies Promotes Cromwell

TTT Ship Agencies, Inc., 71 Broadway, New York, N.Y., announces the promotion of Richard H. Cromwell to vice president and general manager, TTT Stevedores of Texas, Inc. He is responsible for TTT's stevedoring business in the ports of Houston, Galveston, Beaumont and Freeport, Texas, and Lake Charles, La.

Mr. Cromwell has been in the stevedoring business for 23 years, with most of his experience gained in the New York, Baltimore and

Norfolk areas. In 1974, he served as president of the Steamship Trade Association, Baltimore, Md., having served through the ranks of the association for the previous eight years. He was also one of the founders of the Council of North Atlantic Shipping Associations, which negotiates the master contract with the ILA for all North Atlantic ports.

In 1969-70, Mr. Cromwell also served as president of The Propeller Club, Port of Baltimore. He joined TTT in Houston in May of last year.

## Eriksberg Shipyard Installs Butterworth Tank Cleaning Machines

Getty Marine Corporation, a subsidiary of Getty Oil Company, has selected a fixed-in-place tank cleaning system from Butterworth Systems for its newly christened vessel, the M/T Houston Getty.

Fifty-two LAVOMATIC® SA tank cleaning machines were installed in the deck of this 135-mdwton crude oil carrier at the Eriksberg Shipyard in Goteborg, Sweden, early in April.

The full shipset complement installation provides Crude Oil Washing (COW) or seawater washing for all cargo tanks. The Selective Arc capabilities of the LAVOMATIC SA machine permit the use of the latest tank cleaning procedures.

For more information, contact Donald Powell, Butterworth Systems Inc., 224 Park Avenue, P.O. Box 352, Florham Park, N.J. 07932, or Butterworth Systems (UK) Ltd., 445 Brighton Road, South Croydon, Surrey CR2 6EU, England.

## Gazoccean Offers Capabilities Brochure

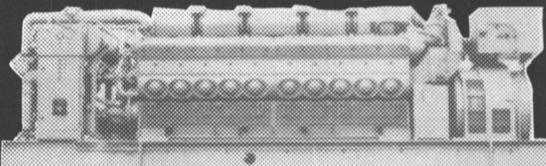
Gazoccean, an international firm which currently has over 25 percent of the world's LPG ocean transport market, announces the availability of a 20-page, full-color, English language edition of its new capabilities brochure.

The brochure explains how Gazoccean has "come of age" over the past 21 years, from a small company in a two-room office to a worldwide conglomerate of LPG, LNG and ethylene shipping, trading, storage and engineering companies.

The brochure also describes the services and innovative technology which have made Gazoccean the leader in the growing worldwide LPG transportation market, with over 25 percent of the current market share.

Copies of the brochure are available free of charge by writing to James D. Benedict, Gazoccean, U.S.A., Inc., Pennzoil Place South Tower, 711 Louisiana, Suite 1200, Houston, Texas 77002.

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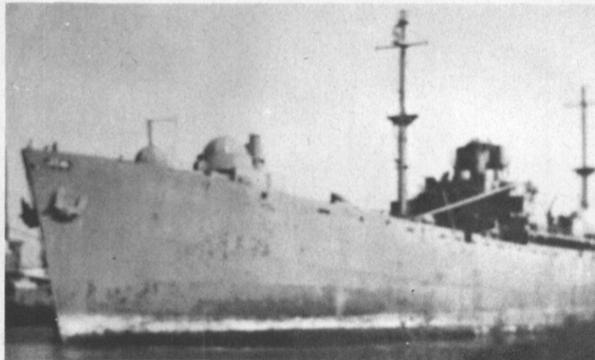
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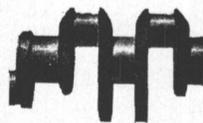
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## Bath Iron Appoints

### Robert J. Bellonzi

President **John F. Sullivan** of Bath Iron Works, Bath, Maine, has announced the appointment of **Robert J. Bellonzi** as manager of Manufacturing Engineering.

He reports to **William E. Hagggett**, executive vice president.



Robert J. Bellonzi

Mr. Bellonzi directs the managers of industrial engineering, plant engineering, the Maritime Administration program, and office maintenance at the shipyard.

A veteran executive, he joined Bath Iron Works from N L Industries, Inc., where he directed national and international manufacturing operations.

Previously, he served in management positions with the General Electric Company after starting with the firm as a management and manufacturing trainee.

A former first lieutenant in the U.S. Army Corps of Engineers, he was graduated from Northeastern University with a degree in industrial engineering, and also took advanced courses in manufacturing management and computer sciences.

## Far East-Levingston Building Pipelay Barge For NPCC, Abu Dhabi

Far East-Levingston Shipbuilding Ltd. has been awarded a contract to build a pipelay barge for the National Petroleum Construction Company (NPCC), Abu Dhabi.

The pipelay barge, measuring 106 meters in length (about 348 feet), 30 meters in breadth (about 98 feet), and 7.5 meters in depth (about 25 feet), with a designed draft of 4.2 meters (about 14 feet), is intended for operations in water depth ranging from 16 to 100 feet in the Arabian Gulf, with weather conditions of the area taken into account. Five welding stations provide central lay of heavily coated concrete pipe ranging from 6 to 24 inches diameter, with capability to lay up to 42 inches diameter.

All pipe handling on both sides of the central lay line is fully automated. The pipe tensioning equipment has a capacity of 100,000 pounds and includes a single drum abandon-and-recovery winch which is remote controlled.

The barge is provided with bal-

lasting capacity to enable adjustments for drafts, list and trim. Air-conditioned quarters are provided for 230 men, including a hospital.

The barge is constructed, fully equipped and outfitted in accordance to the classification of American Bureau of Shipping, Maltese Cross, all ocean, and to U.S. Coast Guard standards. Special consid-

eration in building has been given to eliminate factors contributing to barge downtime due to difficult or frequent maintenance or repair or access to such components that may require maintenance or repair.

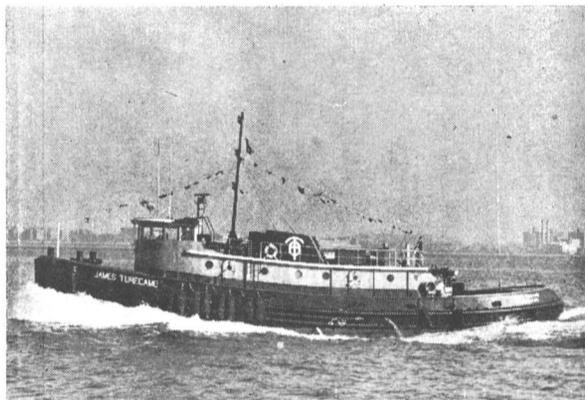
Far East-Levingston Shipbuilding Ltd. is a Singapore-based builder of offshore and marine equipment. Past projects have in-

cluded several types of jackup mobile offshore drilling units, semisubmersibles, drillships and craneships. A current project involves a jackup for delivery to Saudi Arabia.

Far East-Levingston Shipbuilding is a member of the Keppel Group of Singapore and is entirely Singapore-owned and managed.

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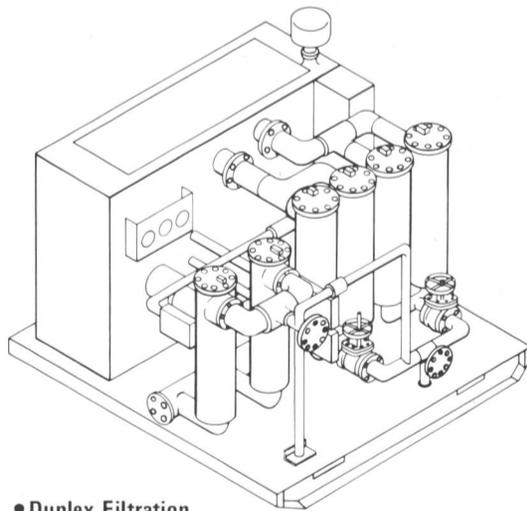
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M.I.T.'s 7th Annual Sea Grant Lecture, "Oil Pollution of the Oceans: The Tanker Owner's Perspective," will be delivered by **Erling D. Naess** on October 24, at 3 p.m., in the Little Kresge Theatre on the M.I.T. campus.

For more information, contact **E.R. Pariser**, Associate Director, M.I.T. Sea Grant Program, 77 Massachusetts Avenue, Cambridge, Mass. 02139.

## Schottel Of America, Inc. Opens New Office And Plant

**Franz Krautkremer**, president of the Schottel Group of Companies, recently officiated at the opening of new offices of Schottel of America, Inc., now located at 8375 N.W. 56th Street, Miami, Fla. 33166.

Schottel, the world's largest supplier of specialized propulsion equipment, has offices, warehouses and production facilities on all five continents and in 13 major cities.

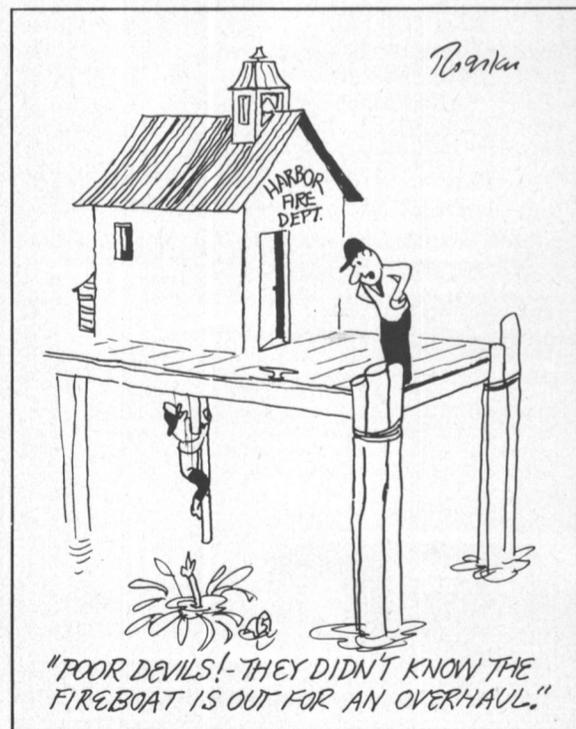
For the past five years, Schottel has steadily expanded its production of propulsion equipment at its former plant on N.W. South River Drive. The production area in the new building enables Schottel to build—in the United States—larger size bow thrusters and other types of right-angle drive propulsion units.

The relocation of the offices and workshop was necessary in order to fill a backlog of orders, and also to expand the warehouse facilities for the spare parts requirements of an ever-increasing number of propulsion units sold and serviced by Schottel of America.

The new building houses a complete machine shop, complete welding and fabrication shop, and complete assembly and repair facility.

Schottel currently has under construction six 1,250-horsepower containerized thruster units to be used for dynamic positioning, station-keeping and propulsion assist on offshore drilling rigs.

Schottel Rudder-Propellers, thrusters and other maneuvering aids have been installed in major newly constructed dynamically positioned vessels, tugboats, offshore rigs, supply vessels, and inland barges in the United States and in Europe.



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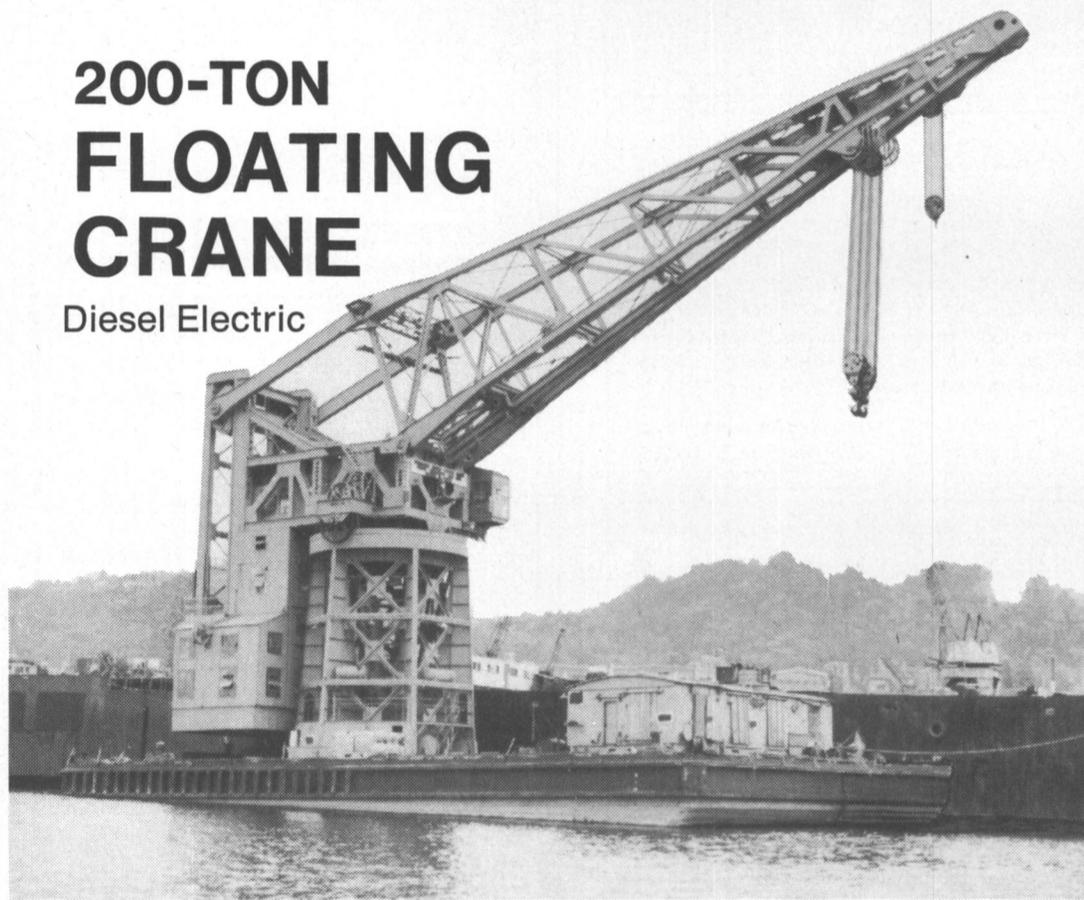
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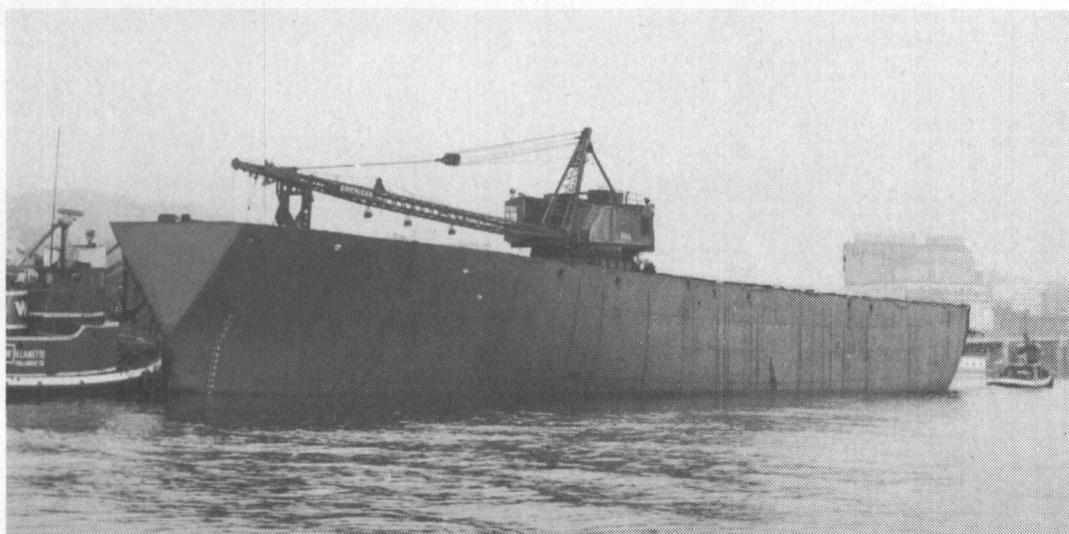
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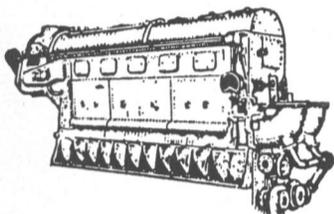
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### D. C.

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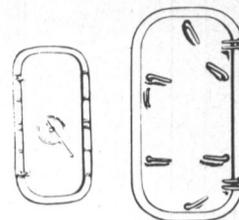
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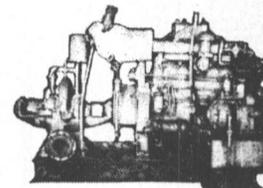
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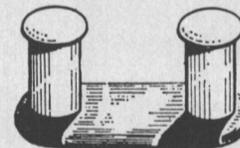
1—GARDNER-DENVER, 150 CFM, 125 PSI, Class WB, Size 7x5 1/4 x5, with Diehl Motors, 45 HP, 230 Volts DC, 870 RPM, 167 Amperes.

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

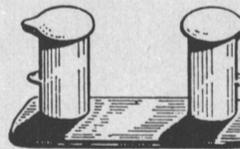
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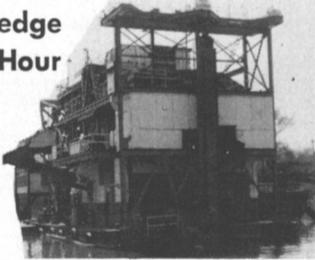
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225 KW 230 V DC

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280 KW — 220 V — DC 500 R.P.M.

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Single out 3,957:1

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Length 269' x 64' x 25'  
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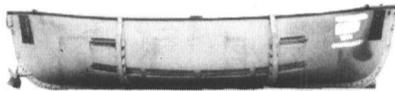
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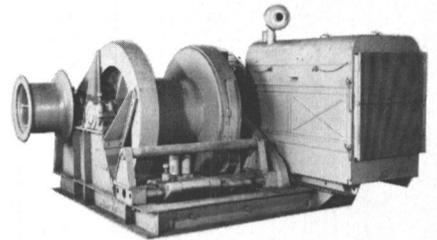
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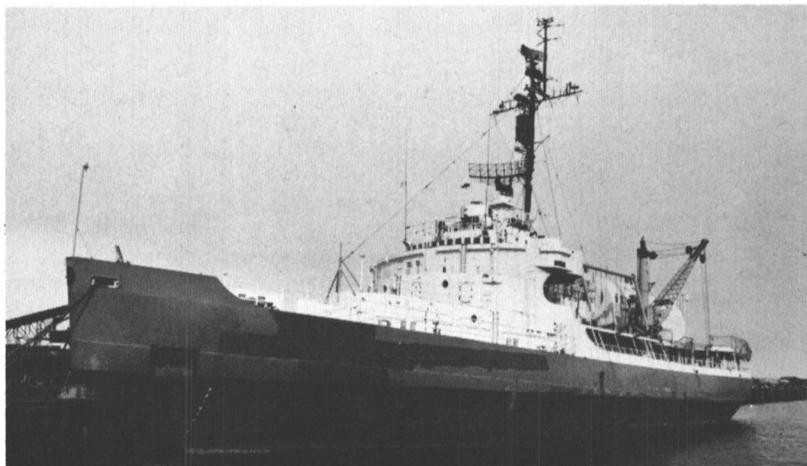
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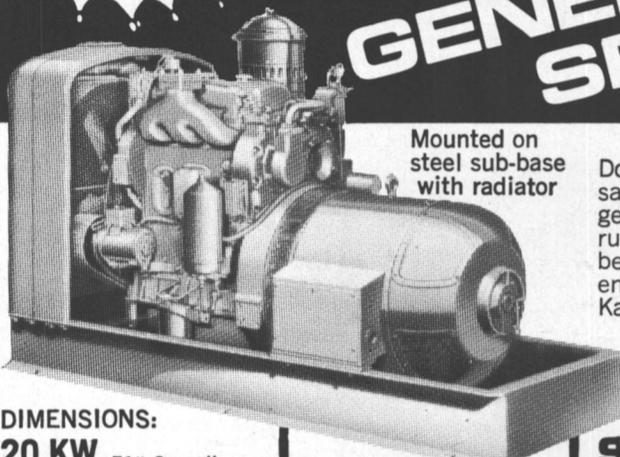
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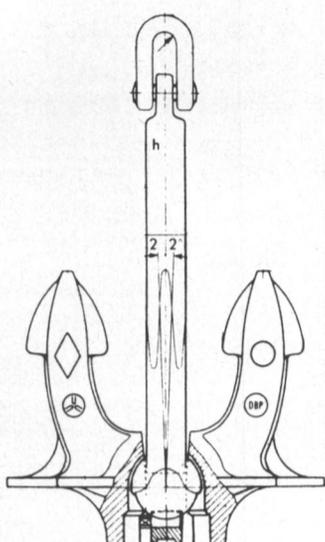
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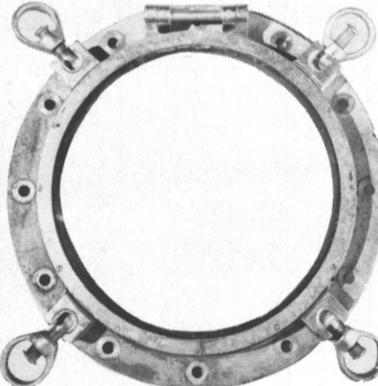
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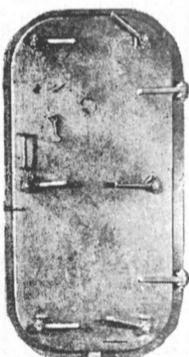
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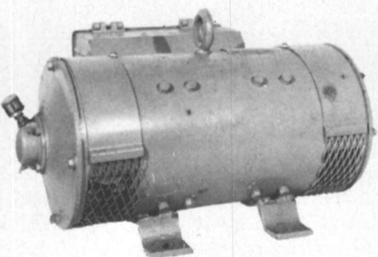
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Marine Electric RPD Inc., 166 National Road, Edison, N.J. 08817  
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Sperry Marine Systems Div., Charlottesville, Va., 22901, Division of Sperry Rand Corp.

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Marsh & McLennan Inc., 1221 Ave. of the Americas, New York, N.Y. 10020

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Coast Engineering Co., 711 W. 21st St., Norfolk, Va. 23517

Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, Mass. 02026

Crane Consultants Inc., 15301 1st Ave., So. Seattle, Washington 98148

Francis B. Crocco, Inc., Box 1411, San Juan, Puerto Rico

C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048

Daniel Yacht & Ship Brokerage Ltd., 1861 S.E. 17th St., Suite 206, Ft. Lauderdale, Fla. 33316

Design Associates, Inc., 3308 Tulane Ave., New Orleans, La. 70119

Designers & Planners Inc., One State Street Plaza, New York, N.Y. 10004

M. Mack Earle, 103 Mellor Ave., Baltimore, Md. 21228

Parker C. Emerson & Associates, 17935 Cardinal Drive, Lake Oswego, Oregon 97034

Christopher J. Foster, Inc., 14 Vanderventer Ave., Port Washington, N.Y. 11050

Friede and Goldman, Ltd., 225 Baronne St., New Orleans, La. 70112

Gibbs & Cox, Inc., 40 Rector Street, New York, N.Y. 10006

John W. Gilbert Associates, Inc., 58 Commercial Wharf, Boston, Mass. 02110

Arthur A. Grant & Son, Inc., 1745 First National Bank of Commerce Bldg., New Orleans, La. 70112

Phillip Gresser & Associates (PTE) Ltd., 122 Eng Neo Ave., Singapore 11

Morris Guralnick Associates, Inc., 550 Kearny Street, San Francisco, Calif. 94108

J.J. Henry Co., Inc., Two World Trade Center—Suite 9528, New York, N.Y. 10048

Hydranautics, Incorporated, 7210 Pindell School Road, Howard County, Laurel, Maryland 20810

Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, Md. 21227

James S. Krogen & Co., Inc., 3333 Rice St., Miami, Fla. 33133

Littleton Research and Engrg. Corp., 95 Russell St., Littleton, Mass. 01460

Robert H. Macy, P.O. Box 758, Pascagoula, Miss. 39567

Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114

Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, N.Y. 11746

Maritime Service Company, 1357 Rosecrans St., Suite B, San Diego, CA 92106

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

Metricape, Inc., 77 Commonwealth Ave., West Concord, Mass. 01742

Nelson & Associates, Inc., 2001 N.W. 7th Street, Miami, Florida 33125

Nickum & Spaulding Associates, Inc., 811 First Ave., Seattle, Wash. 98104

Ocean-Oil International Engineering Corporation, 3019 Mercedes Blvd., New Orleans, La. 70114

Pearson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, Florida 33156

S.L. Petchul, Inc., 1380 SW 57th Ave., Fort Lauderdale, Fla. 33317

Proto-Power Management Corporation, P.O. Box 494, Mystic, Conn. 06355

M. Rosenblatt & Son, Inc., 350 Broadway, New York, N.Y. 10013

and 657 Mission St., San Francisco, Calif.

Sargent & Herkes, Inc., 611 Gravier St., New Orleans, La. 70130

Schmah and Schmah, Inc., 1209 S.E. Third Ave., Fort Lauderdale, Florida 33316

Seaworthy Engine Systems, 73 Main Street, Essex, Conn. 06426

George G. Sharp, Inc., 100 Church St., New York, N.Y. 10007

T. W. Spaetgens, 156 West 8th Ave., Vancouver, Canada V5Y 1N2

SRS Shipping Research Services Inc., 205 S. Whiting St., Alexandria, VA 22304

The Stanwick Company Maritime Systems Department, 3661 E. Virginia Beach Blvd., Norfolk, VA 23502

R. A. Stearn, Inc., 100 Iowa St., Sturgeon Bay, Wisc. 54235

Richard R. Taubler Inc., 8 Columbia St., Milford, Del. 19963

H.M. Tiedemann & Co., Inc., 295 Greenwich Ave., Greenwich, Conn. 06830

Thames Engineering Consultants Inc., P.O. Box 589, New London, Ct. 06320

Timco, 951 Government St., Suite 2161, Mobile, Alabama 36604

Uhlig & Associates, Inc., 8295 S.W. 188th St., Miami, Florida 33157

Undersea Systems, 112 W. Main St., Bay Shore, N.Y. 11706

Wesley D. Wheeler Associates, Ltd., 104 East 40 St., Suite 207, New York, N.Y. 10016

## NAVIGATION & COMMUNICATIONS EQUIPMENT

American Hydromath Co., Buckwheat Bridge Rd., Germantown, N.Y. 12526

Anschuetz of America, 444 5th Ave., New York, N.Y. 10018

Automated Marine Systems Division, Litton Systems Canada Limited, 21101 Oxnard St., Woodland Hills, CA 91364

Communication Associates, Inc., 200 McKay Road, Huntington Station, N.Y. 11746

Comsat General Corp., 950 L'Enfant Plaza, S.W., Washington, D.C. 20024

Electro-Nav, Inc., 1201 Corbin St., Elizabeth Marine Terminal, Elizabeth, N.J. 07201

Griffith Marine Navigation, Inc., 134 North Avenue, New Rochelle, N.Y. 10801

Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913

Hose McCann Telephone Co., Inc., 524 W. 23rd St., N.Y. 10011

Intermarine Electronics, Inc., Flowerfield Bldg. #7, St. James, N.Y. 11780

Iatron Corp., 5 Alfred Circle, Bedford, Mass. 01730

ITT Decca Marine Inc., P.O. Box G, Palm Coast, Fla. 32037

ITT Mackay Marine, 2912 Wake Forest Road, Raleigh, N.C. 27611

Konel Corporation, 271 Harbor Way, So. San Francisco, Calif. 94080

Krupp Atlas—Elektronik, A Div. of Krupp Intl. Inc., P.O. Box 58218,

## BUYERS DIRECTORY (continued)

### OIL PURIFIERS—Separators

Golden Marine Co., Inc., 160 Van Brunt St., Brooklyn, N.Y. 11231

### OILS—Marine—Additives

Gulf Oil Trading Co., 1290 Ave. of Americas, New York, N.Y. 10019  
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002  
Mobil Oil Corporation, 150 East 42nd St., New York, N.Y. 10017  
Texaco, Inc. (International Marine) 135 East 42nd St., N.Y., N.Y. 10017

### PAINT—Coatings, Protective

Carboline Co., Marine Div., 350 Hanley Industrial Court, St. Louis, Mo. 63144  
Devoe & Reynolds Co., Inc., P.O. Box 7600, Louisville, Ky. 40207  
Hanline Bros., Inc. (Consol Paint), 1400 Warner St., Baltimore, Md. 21230  
International Paint Co., 17 Battery Place North, Suite 1150, New York, N.Y. 10004  
Mobil Chemical Co., Maintenance & Marine Coatings Dept., P.O. Box 250, Edison, N.J. 08817  
Petterson Sargent Co., 1471 Jersey Ave., New Brunswick, N.J. 08901  
Products Research & Chemical Corp., (PRC Coating and Sealants Div.) 5430 San Fernando Road, Glendale, California 91203

### PETROLEUM SUPPLIES

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

### PILOT LADDERS—Wood Products

A.L. Don Co., 58 Grant Avenue, Carteret, N.J. 07008

### PIPE—HOSE—Cargo Transfer, Clamps, Couplings

Camlock Flange Sales Corp., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696  
Hydro-Craft, Inc., 4223 Edgeland, Royal Oak, Mich. 48073  
Kubota, Ltd., 22, Funade-cho 2-chome, Naniwa-Ku, Osaka, Japan  
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

### PLASTICS—Marine Applications

Hubeva Marine Plastics, Inc., 390 Hamilton Ave., Bklyn, N.Y. 11231

### PLATENS

Welding Wholesale Co., Div. J.A. Cunningham Eqpt., Inc., 2151 Dreer St., Philadelphia, Pa. 19125

### PROPELLERS: NEW AND RECONDITIONED—SYSTEMS

Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150  
Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081  
The Columbian Bronze Corp., 216 North Main Street, Freeport, N.Y. 11520  
Coolidge Propellers, 1601 Fairview Ave. East, Seattle, Wash. 98102  
Escher Wyss Gmbh, P.O. Box 798, Ravensburg, Germany  
Lips BV, Lipsstraat 52, Drunen, Netherlands  
LIPS Propeller Works Inc., 420 Lexington Ave., New York, N.Y. 10017  
Voith Schneider—U.S. Agent: Krupp International, Inc., 550 Mamaroneck Ave., Harrison, N.Y. 10528

### PROPULSION—Marine

Combustion Engineering, Inc., Windsor, Connecticut 06095  
Delaval Turbine Inc., Turbine Div., Trenton, N.J. 08602  
In-Place Machining Co., 1929 N. Buffman St., Milwaukee, WI 53212  
Port Electric Turbine Div., 155-157 Perry St., New York, N.Y. 10014  
Schottel of America, Inc., 21 N.W. South River Dr., Miami, Fla. 33128  
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 10523

### PUMPS—Repairs—Drives

Delaval Turbine Inc., IMO Pump Division, P.O. Box 321, Trenton, N.J. 08602  
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030  
Worthington Pump Inc., P.O. Box 1250, Mountainside, N.J. 07092

### RATCHETS

CM American, Division Columbus McKinnon Corp., P.O. Box 74, McKees Rocks, Pa. 15136

### REFRIGERATION—Refrigerant Valves

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231  
Part Refrigeration Div., 157 Perry Street, New York, N.Y. 10014  
Stal-Laval, Inc., 400 Executive Blvd., Elmsford, N.Y. 19523

### RIGGING & BLOCKS

Superior Switchboard & Devices, Division of Union Metal Manufacturing Company, P.O. Box 590, Canton, Ohio 44701  
D. Van Beest En Zn.B.V., P.O. Box 57, Merwestraat 1-5, Slidrecht, The Netherlands

### ROPE—Manila—Nylon—Hawsers—Fibers

American Mfg. Co., Inc., Willow Avenue, Honesdale, Pa. 18431  
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110  
The Cordage Group, Columbian Drive, Auburn, N.Y. 13021  
Wall Rope Works, Inc., Beverly, N. J. 08010

### RUDDER ANGLE INDICATORS

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

### SCAFFOLDING EQUIPMENT—Work Platforms

Chamberlain Manufacturing Corp., 845 Larch Ave., Elmhurst, Ill. 60126  
Patent Scaffolding Co., 2125 Center Ave., Fort Lee, N.J. 07024  
Spider Staging Sales Co., P.O. Box 182, Renton, Washington 98055  
Trus Joist Corp., P.O. Box 60, Boise, Idaho 83707

### SEWAGE—Pollution Control

Argo Marine, Pollution Systems Division, 140 Franklin St., New York, N.Y. 10013  
Clear Water, Inc., N. Main Street, Walworth, WI 53184  
Colt Industries, Water & Waste Management Operation, Beloit, Wisc. 53511  
Demco, Inc., P.O. Box 94700, Oklahoma City, Oklahoma 73109  
Engelhard Industries, Chloropac Systems, 2655 U.S. Rt. 22, Union, N.J. 07083  
Marine Moisture Control Co., Inc., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696  
Marland Environmental Systems, Inc., N. Main Street, Walworth, WI 53184  
Microphor, Inc., P.O. Box 490, Willits, CA 95490  
Red Fox Industries, P.O. Drawer 640, New Iberia, La. 70560  
Research Products/Blankenship, 2639 Andjon, Dallas, Texas 75220  
St. Louis Ship FAST Sewage Systems, 611 East Marceau St., St. Louis, Mo. 63111

### SHAFTS, SHAFT REVOLUTION INDICATOR EQUIP.

Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043  
Henschel Corp., 14 Cedar St., Amesbury, Mass. 01913  
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

### SHIPBREAKING—Salvage

American Ship Dismantlers, Inc., Division of Schnitzer Industries, 3300 N.W. Yeon Avenue, Portland, Ore. 97210  
The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202  
Levin Metals Corp., 1310 Canal Blvd., Richmond, CA 94807  
National Metal & Steel Corp., 691 New Dock St., Terminal Island, Cal. 90731  
Zidell Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201

### SHIPBUILDING STEEL

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

### SHIPBUILDING—Repairs, Maintenance, Drydocking

Arab Shipbuilding & Repair Yard Co., P.O. Box 5110, Bab-Al-Bahrain Building, Bahrain, Arabian Gulf  
Astilleros Espanoles, S.A., 17, Padilla, Madrid 6, Spain  
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans La. 70150  
Bergeron Industries Inc., P.O. Box 38, St. Bernard, La. 70085  
Bethlehem Steel Corp., Shipbuilding, 25 Broadway, N.Y., N.Y. 10004  
Blohm + Voss AG, D-2000 Hamburg 1, P.O.B. 10 07 20  
Blohm + Voss Co., 55 Morris Ave., Springfield, N.J. 07081  
Blount Marine Corp., P.O. Box 368, Warren, RI 02885  
Bludworth Shipyard, Inc. (Subsidiary of Elpac, Inc.), 8502 Cypress St., Houston, Texas 77012  
Boston Marine Industrial Park, Public Drydock No. 3, 60 Congress St., Boston, Mass. 02109  
Carrington Slipways Pty, Ltd., Old Punt Road, Tomago, N.S.W., Australia 2322  
CCL Shipcare Limited, Easton Lane Winnall Estate, Winchester Hampshire, England SO237QU  
China Shipbuilding Corp., c/o Allegro Transportation Supply Co., 393 Seventh Ave., Room 234, New York, N.Y. 10001  
Conrad Industries, P.O. Box 790, Morgan City, La. 70380  
Curacao Drydock Co., Inc., P.O. Box 153, Willemstad, Curacao, Netherlands Antilles  
Curacao Drydock, 26 Broadway, Suite 741, New York, N.Y. 10004  
Dravo Corporation, One Oliver Plaza, Pittsburgh, Pa. 15222  
Dravo Steelship Corp., R.4, Box 167, Pine Bluff, Ark. 71602  
Equitable Shipyards, Inc., P.O. Box 8001, New Orleans, La. 70122  
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, Oregon 97208  
General Dynamics, Quincy Division, Quincy, Mass. 02169  
Gladding-Hearn Shipbuilding Corporation, 1 Riverside Avenue, Somerset, Mass. 02725  
Granges Repair Service GMBH, P.O. Box 3166, Gutenbergring 64, D-2000 Hamburg-Norderstedt Germany  
Halper Marine Services, Inc., Route 6, Box 287H, New Orleans, La. 70126  
Harland & Wolff Shipbuilding & Engineering, Queens Island, Belfast, Northern Ireland  
Havre de Grace, Havre de Grace, Md.  
Hillman Barge & Construction Co., P.O. Box 510, Brownsville, Pa. 15417  
Hitachi Shipbuilding & Engrg. Co., Ltd., 47 Edobori 1-Chome, Nishi-Ku, Osaka, Japan  
Hongkong United Dockyards Ltd., Kowloon Docks, Hong Kong  
Hyundai Mipo Dockyard Co., Ltd., 456 Cheonha-dong, Ulsan, Korea  
Hyundai Shipbuilding & Heavy Industries Co., Ltd., 5 World Trade Center, Suite 679, New York, N.Y. 10048  
Jeffboat, Inc., Jeffersonville, Ind. 47130  
Kawasaki Heavy Industries, Ltd., Kawasaki Kisen Kaisha, Ltd., 8 Kaigan-dori, Kuta-ku, Kobe, Japan  
Kockums Shipyard, S-201, 10 Malmo 1, Sweden  
Lantana Boatyard, Inc., 808 N. Dixie Hwy., Lantana, Fla. 33460  
Lisnave Estaleiros, Navais de Lisboa, Apartado 2138, Lisbon 3 Portugal  
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 Dunbartonshire, G81-1YB, Scotland  
Marinette Marine, Ely Street, Marinette, WI 54143  
Matton Shipyard Co., Inc., P.O. Box 645, Cohoes, New York 12047  
Maxon Marine Industries, Inc., P.O. Box 349, Tell City, Ind. 47586  
J. Ray McDermott & Co., Inc., P.O. Box 60035, New Orleans, LA 70160  
Mercantile Marine Engineering & Graving Docks Co., N.V., Antwerp, Belgium  
Misener Industries, Inc., 5353 Tyson Avenue, P. O. Box 13625, Tampa, Fla. 33681  
Mitsui Shipbuilding & Engrg. Co. Ltd., 6-4, Tsukiji 5-chome, Chuo-ku, Tokyo, Japan  
Monark Boat Co., P.O. Box 210, Monticello, Ark. 71655  
Murray & Stewart (Marine) (PTY) Ltd., Ocean Road-Table Bay Harbour, P.O. Box 1909, Cape Town 8000, South Africa  
National Steel & Shipbuilding Corp., San Diego, Calif. 92112  
Neorion Shipyards Syros, Ltd., Syros, Greece  
Newport News Shipbuilding & Dry Dock Co., 4101 Washington Ave., Newport News, Va. 23607  
Northwest Marine Iron Works, P. O. Box 3109, Portland, Oregon 97208  
O.A.R.N. (Officine Allestimento-Riparazioni Navi), P.O. Box 1395, Genoa, Italy 16100  
Paccco, 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  
Port Allen Marine Service, Inc., P.O. Box 108, Port Allen, LA 70767  
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  
Sun Shipbuilding, Foot of Morton Ave., Chester, Pa. 19013  
Swiftships Inc., P.O. Box 1908, Morgan City, LA 70380  
Tampa Ship Repair & Dry Dock Co., P.O. Box 1277, Hookers Point, Tampa, Fla. 33601  
Terrin Shipyards, Societe Provencale des Ateliers Terrin, 287, Chemin DeLa Madrague, 13345 Marseille—Cedex 3, France  
Todd Shipyards Corp., 1 State St. Plaza, New York, N.Y. 10004  
Tracor Marine, P.O. Box 13107, Port Everglades, Fla. 33316  
Union Dry Dock & Repair Co., Foot of Pershing Road, Weehawken, N.J. 07087  
Vancouver Shipyards Co., Ltd., 50 Pemberton Ave., North Vancouver, B. C., Canada  
Wall Shipyard, P.O. Box 419, Harvey, La. 70058  
Wiley Mfg., a unit of AMCA International Corp., Suite 200/Stockton Bldg., University Office Plaza, Newark, Del. 19702

### SHIP STABILIZERS

Pacific Marine Products, Inc., P.O. Box 11, Kenmore, Wa. 98028  
Sperry Marine Systems Div., Charlottesville, Va. 22901, Division of Sperry Rand Corp.

### SHOCK CORDS

Wm. B. Bliss Inc., 381 Park Ave. So., New York, N.Y. 10016

### SMOKE INDICATORS

Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928

### STUFFING BOXES

Johnson Rubber Co. (Marine Div.), 16025 Johnson St., Middlefield, Ohio 44062

### SURVEYORS AND CONSULTANTS

Hull & Cargo Surveyors Inc., 59 John St., New York, N.Y. 10038

### TANK CLEANING

Butterworth Systems Inc., 224 Park Ave., P.O. Box 352, Florham Park, N.J. 07932  
Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

### TANK LEVELING INDICATORS

Gems Sensors Div., Delaval Turbine Inc., Spring Lane, Farmington, Conn. 06032

### TERMINALS—Oil-Transfer

DeLong Corporation, 29 Broadway, New York, N.Y. 10006  
Transportation Concepts & Techniques, Inc., 551 Fifth Avenue, New York, N.Y. 10017

### TOWING—Vessel Chartering, Lighterage, Salvage, etc.

Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002  
Chotin Transportation, Inc., 1414 One Shell Square, New Orleans, La. 70139  
Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md. 21202  
Henry Gillen's Sons Lighterage, 21 West Main St., Oyster Bay, N.Y. 11771  
Gulf Mississippi Marine Corp., 225 Baronne St., New Orleans, La. 70112  
James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004  
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004  
McDonough Marine Service, P.O. Box 26206, New Orleans, La.  
Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, N.Y. 10048  
Suderman & Young Co., Inc., 918 World Trade Bldg., Houston, Texas 77002  
Turecamo Coastal & Harbor Towing Corp., One Edgewater St., Clifton, Staten Island, N.Y. 10305  
B.V. Bureau Wijsmuller, Postbus 510, Ijmuiden, Holland

### TURBINES

Nicolai Joffe Corp., P.O. Box 2445, South San Francisco, CA 94080

### UNDERWATER SERVICES

International Underwater Contractors Inc., 222 Fordham Street, City Island, New York, N.Y. 10464  
Undersea Systems, 112 W. Main St., Bay Shore, N.Y. 11706

### VALVES AND FITTINGS

American-Darling Valve, Div. of American Cast Iron Pipe Co., P.O. Box 2727, Birmingham, Ala. 35202  
Contromatics Div., Litton Industrial Products, Inc., 222 Roberts St., East Hartford, CT 06108  
Demco, Inc., P.O. Box 94700, Oklahoma City, Okla. 73109  
Dover Corporation/Norris Division, P.O. Box 1739, Tulsa, Oklahoma 74101  
Leslie Company, 399 Jefferson Road, Parsippany, N.J. 07054  
Marine Moisture Control Co., 449 Sheridan Blvd., Inwood, N.Y. 11696  
Mechanical Marine Co., 900 Fairmount Ave., Elizabeth, N.J. 07027  
Stow Manufacturing Co., 86 Bump Road, Binghamton, N.Y. 13902  
Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928  
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

### WATER PURIFIERS

Evepure Inc., 600 North Blackhawk Drive, Westmond, Ill. 60559

### WEATHER FORECASTS

Fleetweather, Orbit Lane, Hopewell Junction, N.Y. 12533

### WINCHES

Clyde Iron, a unit of AMCA International Corp., Suite 200/Stockton Bldg., University Office Plaza, Newark, Del. 19702  
Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134  
Victoria Machine Works, P.O. Box 1939, Victoria, TX 77901

### WINDOWS

Kearfott Marine Products, A Singer Co., 550 South Fulton Avenue, Mt. Vernon, N.Y. 10550

### WIRE AND CABLE

Anixter Bros., Inc., 4711 Golf Road, One Concourse Plaza, Skokie, Illinois 60076  
Elkan Electric Cable Co., 248 Third St., Elizabeth, N.J. 07206

### WIRE ROPE—Slings

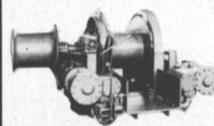
Armco Steel Corp., 703 Curtis St., Middletown, Ohio 45042  
Bethlehem Steel Corp., Bethlehem, Pa. 18016

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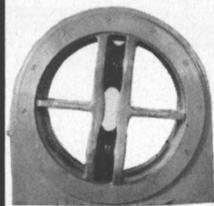
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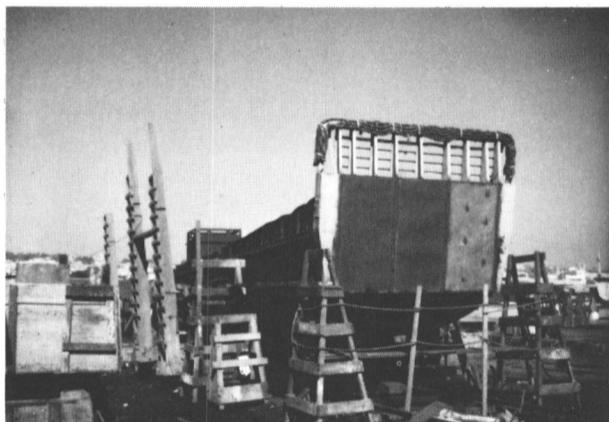
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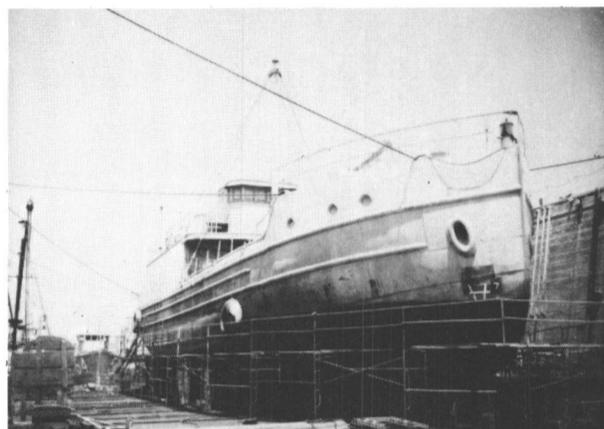
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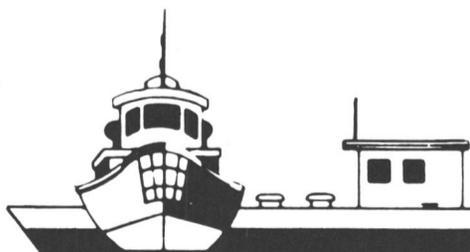
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5. Gray Marine (GM6-71)  
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8. Personnel Boat C-4471  
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# How much of your hopper barge fleet is obsolete?

How much of your fleet is ten years old or older? How much is fifteen years old or older?

Why not take a few minutes and determine the average age of your fleet. The results might surprise you.

Those ten- and fifteen-year anniversaries are important dates. Here's why. Generally, maintenance records will show a heavy increase in annual costs at the ten-year mark, and an even more substantial increase at the fifteen-year mark.

What kinds of substantial costs? It could be side damage on the hull at the wind/water line. Or it could be years of service beginning to take their toll on slopeshets and coaming.

And rising maintenance costs aren't the only cost increases you face. The cost of new barges is increasing, too. With the cost of steel and the other materials continuing to rise, the most economical decision would be to replace obsolete barges *now*.

And when those replacements are Jeffboat-built barges, you're getting heavier, better constructed, truly-crafted vessels that will deliver extra years of profitable service.

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Number of barges	Year built	Age	Percent of total fleet

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