

MARITIME REPORTER

AND
ENGINEERING NEWS



**Bell-Halter To Develop
New Class Of Commercial
Surface Effect Ships**
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**SNAME
Annual
Program**
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NOVEMBER 1, 1977

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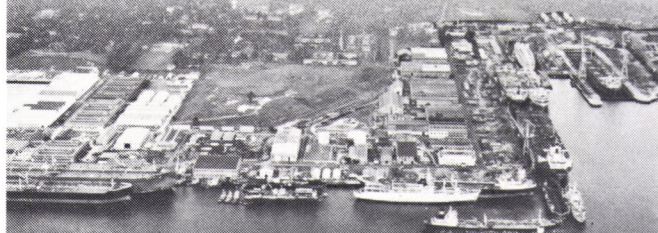
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New York Harbor Containership Terminals Described In Brochure

The Port Authority of New York and New Jersey has published a new brochure containing detailed descriptions of all containership terminals in America's Container Capital. Virtually all of these facilities for intermodal freight handling have been built during the last 15 years to give the bistate port an entirely new physical plant and enable it to be the world's foremost handler of containerized freight. The port is currently handling foreign and domestic waterborne container freight at a rate in excess of 12,000,000 long tons annually.

Designed primarily for exporters, importers, freight forwarders, and others concerned with the movement of international trade, the 16-page brochure provides, for the first time in a single publication, individual full-color photos of the 12 containership terminals in the port; a tabulation of the specialized handling equipment and facilities; as well as the name, address and phone number of each terminal operator. Maps locate railroad container yards and show the location within the port of all containership terminals and their proximity to major highways, as well as railways.

Copies of "Port of New York-New Jersey Containership Facilities" are available free when requested on company letterheads from the Port Promotion Division, One World Trade Center, Room 62W, New York, N.Y. 10048.

Cymeon Barge Lines To Operate Tankers

Cymeon Barge Lines Inc., New York City, has been designated vessel operator and management company for Trefalcon Corp., also of New York, according to Leonard R. Gruber, Trefalcon president. The announcement states that Cymeon, whose president is Ben F. Butler, will operate all the tankers formerly on charter to or operated for Trefalcon by the former agents, Oilborne Shipping, Athens, Greece.

A Trefalcon subsidiary, Elarca S.A., owners of the Trefalcon Logic, have also named Cymeon as sole operator and manager. Elarca was also formerly represented by Oilborne Shipping.



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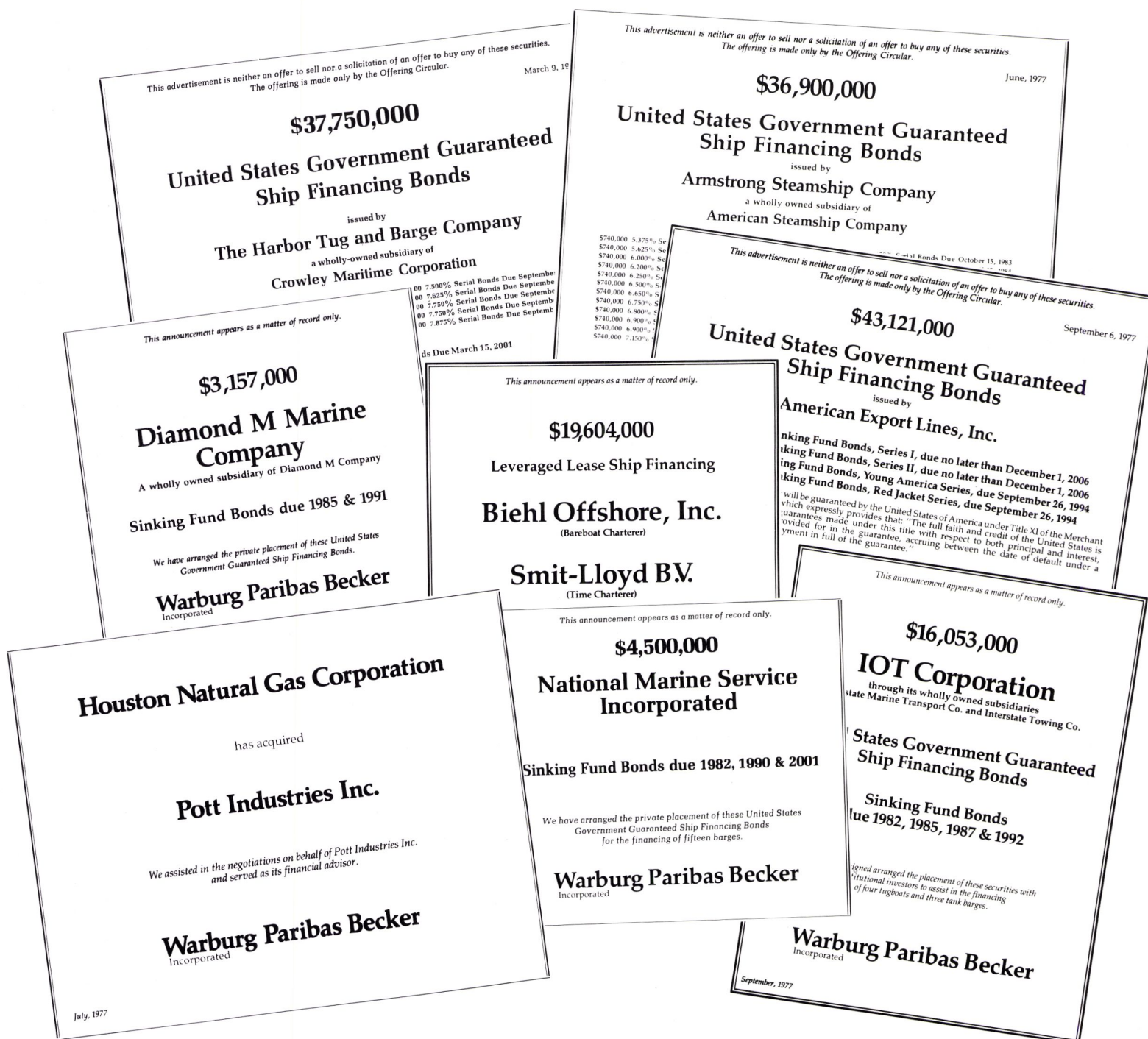
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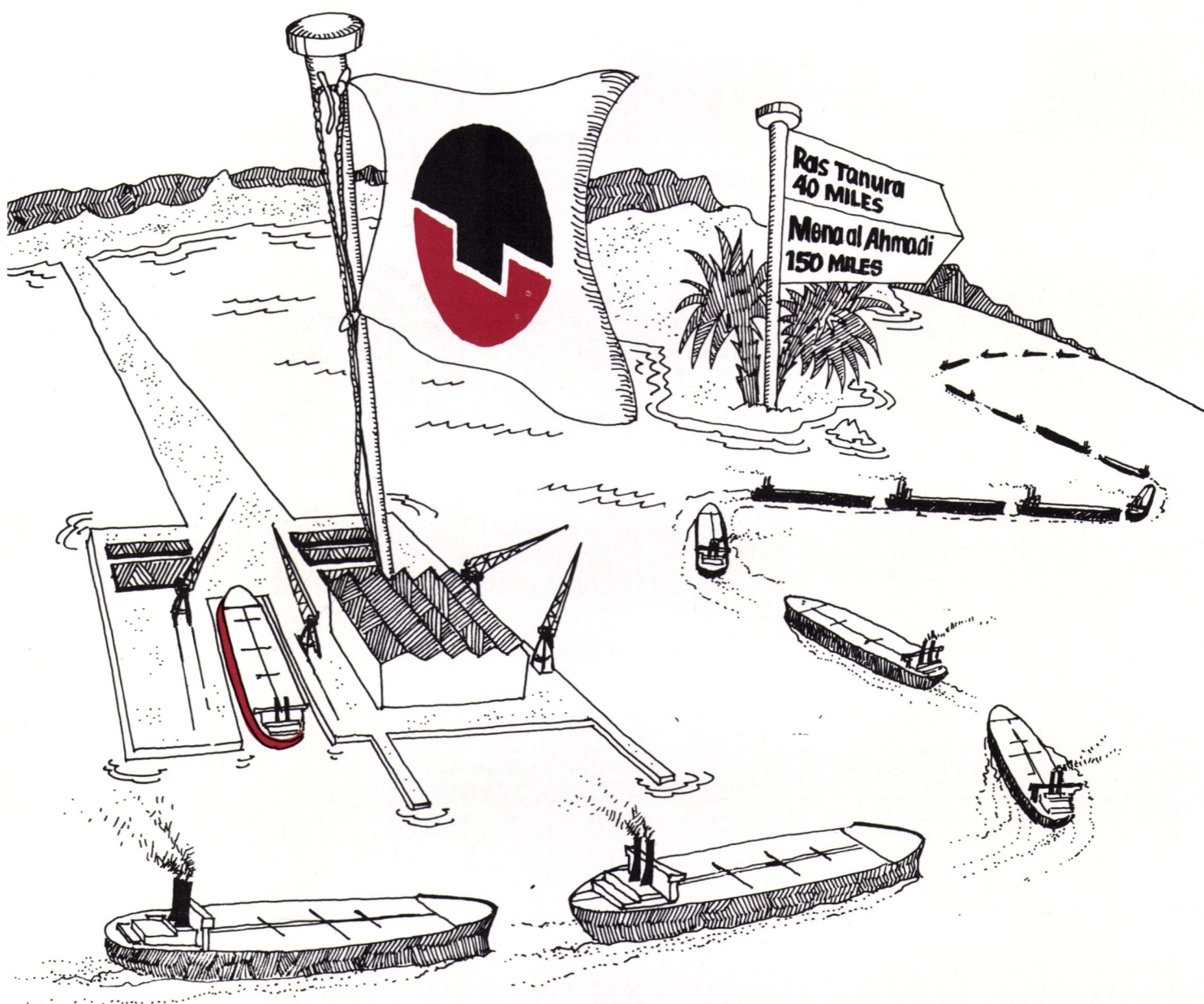
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NASSCO Awarded \$174 Million To Build Destroyer Tender

National Steel and Shipbuilding Company (NASSCO), San Diego, Calif., has been awarded a contract for the construction of a new "Gompers Class" Destroyer Tender (AD-43) by the U.S. Navy for a target price of approximately \$174 million.

The contract is a fixed-price incentive type with escalation provisions covering labor and materials. The contract brings to three the number of ADs to be built by NASSCO for the U.S. Navy. AD-41 was contracted for in late 1975, AD-42 was contracted for in early 1976, and both will be delivered in 1980.

Delivery of AD-43 is scheduled for November 1981.

The ADs have an overall length of 641 feet 2 inches, a maximum molded breadth of 85 feet, a full load displacement of 19,800 tons, and will cruise at speeds in excess of 20 knots. With a crew of over 1,800 officers and enlisted men, the ADs will have the capability to repair and supply new nuclear-powered destroyers that are equipped with missile systems and advanced communications and electronic systems.

The "Gompers Class" destroyer tenders are the first of their type designed since World War II, and are to replace aging fleet tenders in continuous service for more than 30 years.

The contract for AD-43 brings NASSCO's current backlog to about \$600 million.

Other ships under construction at NASSCO include two 90,000-dwt San Clemente-Class tankers and four 188,500-dwt San Diego-Class tankers, all of which are to be used in Alaskan oil trade.

National Steel and Shipbuilding Company is equally owned by Kaiser Industries Corporation and Morrison-Knudsen Company, Inc.

Great Lakes Studies Awards Total \$400,000

The Maritime Administration (MarAd) has announced the award of contracts totaling nearly \$400,000 for two related studies of Great Lakes regional port planning and shipping.

One award of \$150,000 went to Frederic R. Harris, Inc. of Lake Success, N.Y., as the first increment of a two-part, \$350,000 comprehensive port planning and cargo demand study in the eight-state region, including Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin.

This 18-month study will be similar to but broader in scope than a Mid-America port study, covering 17 states in the Mississippi River Basin and the Gulf region, announced earlier this

year by MarAd, an agency of the Department of Commerce.

In addition to assessing cargo demand and transportation supply factors (as in the Mid-America study), the Harris study will develop port marketing strategies for the Great Lakes system, plus the elements of an ongoing data system which will assist future marketing and planning activities throughout the Lakes region.

The related award of \$249,000 went to Simat, Helliesen, and

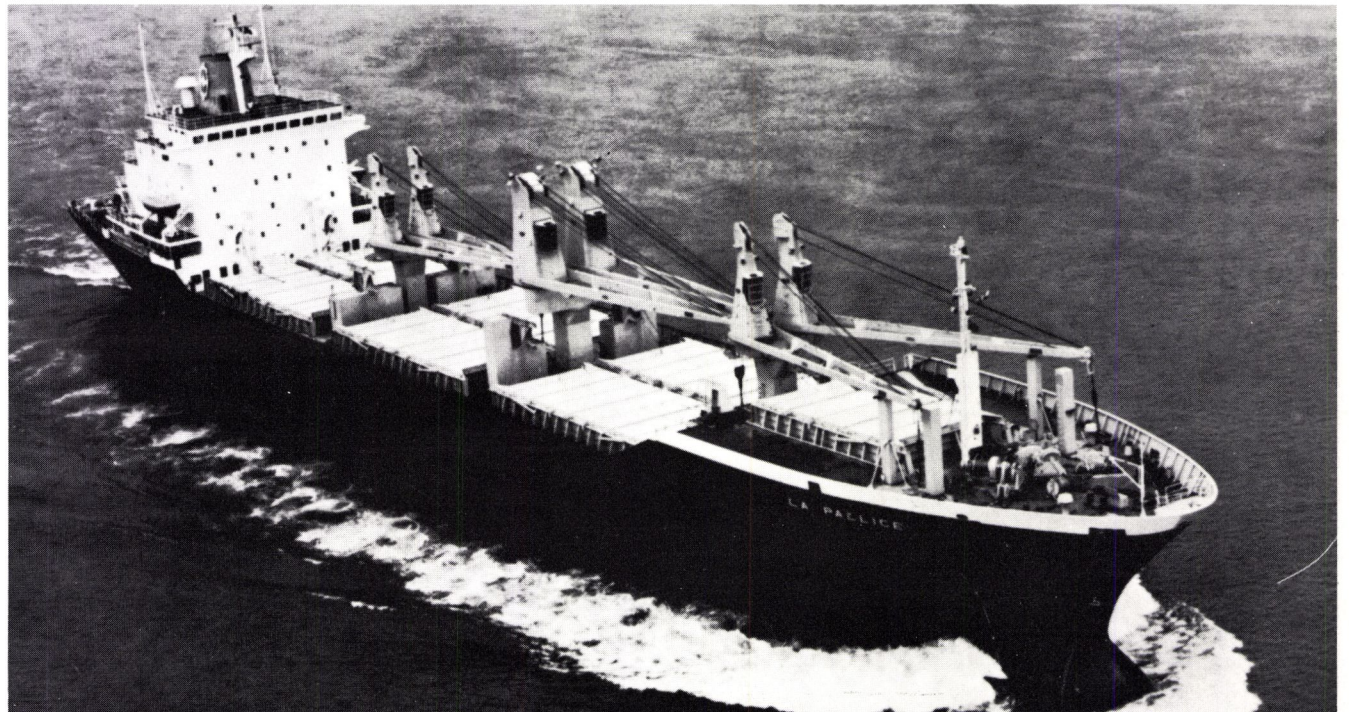
Eichner, Inc. of Boston, Mass., for a traffic and competition assessment of the movement of goods to and from the region via ports on the Great Lakes or competing ports on other U.S. coasts.

This 12-month study is designed to provide a basic analysis of intermodal traffic, which will be used in the second part of the study to be made by Harris. The traffic analysis will cover competitive cargo movements in three modes—water, highway, and rail

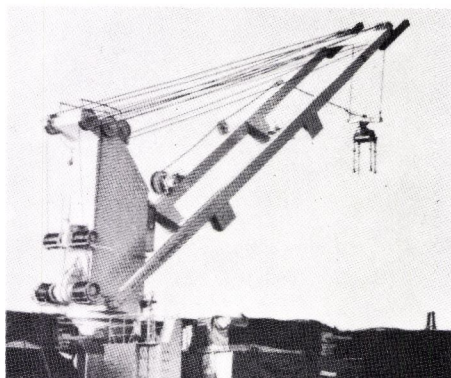
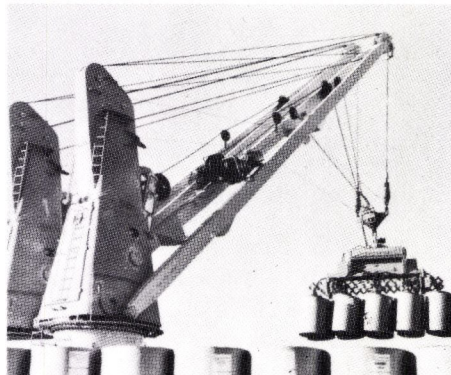
—and by all classes, including containerized, breakbulk (general), and bulk cargoes.

Both Great Lakes studies were recommended by participants in the U.S. Great Lakes-Seaway Port Development and Shipper Conference at Dearborn, Mich., in April 1976 and reaffirmed in program review sessions by industry, labor, institutional, and government representatives at the Port and Shipper Conference in Cleveland, Ohio, last month.

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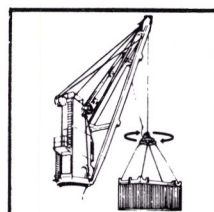


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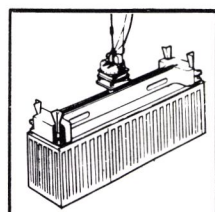
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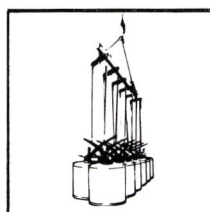
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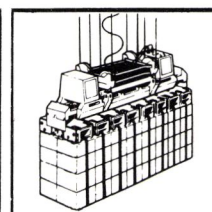
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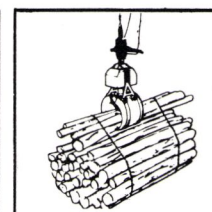
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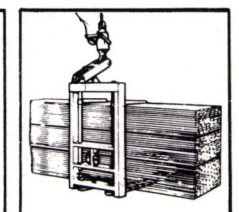
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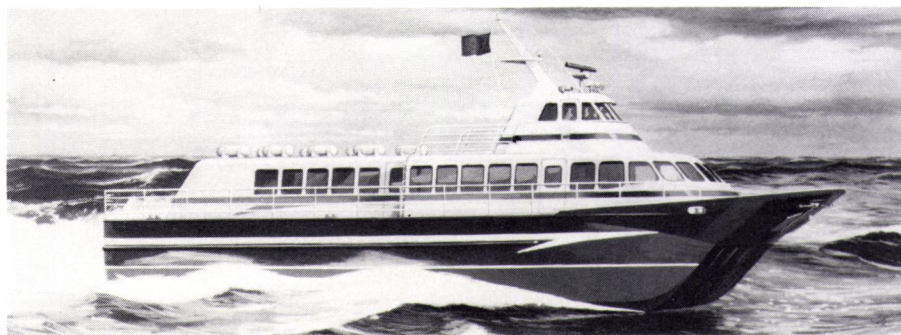


LOG GRAB



LUMBER FORK

Bell Aerospace And Halter Marine To Develop New Class Of Commercial Surface Effect Ships



This configuration is an 85-foot Bell-Halter high-speed passenger ferryboat capable of cruising at 40 knots with conventional marine diesel engines.

A joint venture agreement to develop a new class of Surface Effect Ships for the marine industry has been announced by Bell Aerospace Textron and Halter Marine Services, Inc.

The venture, known as Bell-Halter and based at New Orleans (Post Office Box 29211, New Orleans, La. 70189), has started work toward designing and building a prototype high-speed SES.

"Bell-Halter commercial boats will achieve approximately 30 percent higher speeds than conventional hulls using the same power and conventional marine machinery," said **John J. Kelly**, vice president of Bell Aerospace Textron's New Orleans Operations and manager of Bell-Halter.

"These vessels also offer dramatically improved ride qualities and substantial fuel savings. This performance is obtained by the application of air cushion technology which has been pioneered in the United States by Bell," said Mr. Kelly.

The venture combines Bell's technical know-how with Halter's 20 years of experience as builder of boats. Halter owns and operates eight shipyards in Louisiana and Mississippi and is the world's largest builder of support vessels for the offshore oil and gas industry. Since its founding in 1956, the company has built over 700 vessels for diversified use throughout the world, and many of its designs have become standards by which others are judged. The company builds more than 30 different types of vessels from large steel oceangoing tugs, to high-speed aluminum patrol boats, to fiberglass sailboats.

Specifications of the first Bell-Halter SES have been established. Construction of a 110-foot multi-purpose SES vessel began last month.

A pioneering aviation and aerospace company since its founding in 1935, Bell Aerospace Textron, based in Buffalo, N.Y., entered the air cushion vehicle field in 1958 by designing and building a one-ton research vehicle powered by a 65-horsepower automobile engine.

Over the years, Bell has built a technological base that is presently being applied to the U.S. Government's top ACV programs:

The U.S. Army's LACV-30 (Lighter, Amphibian Air Cushion Vehicle—30-ton payload); U.S. Navy/Marine Corps Landing Vehicle Assault (LVA); and Development of Amphibious Assault Landing Craft (AALC) for the U.S. Navy.

The U.S. Navy's SES-100B Surface Effect Ship, designed and built by Bell, achieved a new world speed record of 90.3 knots (104 mph) on April 2, 1977, near Panama City, Fla.

Operating on St. Andrew Bay, the 100-ton test craft made the speed run while being monitored by the Naval Coastal Systems Laboratory's precise electronic instruments.

In 1976, Bell delivered to the U.S. Army two pre-production LACV-30s for a test and evaluation program. The craft are designed to haul cargo, containers and vehicles from ship-to-shore and inland.

The LACV-30s are stretched and modified versions of the Bell Aerospace Canada Voyageur ACV. They were developed and built under contract to the U.S. Army's Mobility Engineering Research and Development Command, Fort Belvoir, Va.

In the spring of 1977, the U.S. Navy JEFF(B) amphibious assault landing craft was completed at the Bell Aerospace Textron's New Orleans Operations. The 160-ton craft was shipped to the Naval Coastal Systems Laboratory, Panama City, for final fitting and initial tests.

In all technical areas, Bell has established a predominant position through its technical interchange agreement with British Hovercraft Corporation and by SEV/ACV-oriented independent research and development programs.

Halter pioneered and perfected the use of lightweight, high-strength, low-alloy steel in ship construction, and its own research and development staff developed, built, and is testing the first turbine/diesel and waterjet-powered crewboat.

Halter's entrepreneurial spirit is further exemplified by a revolutionary new grain/commodity offloading system under development now, which will offer its owners and operators increased efficiency and economy.

Interesting Paper And Past Chairman's Night Opens Season For SNAME New York Section



Officers and authors participating in the meeting, left to right: **M.W. Hirschowitz**, Membership chairman; **D.A. O'Neil**, vice chairman; **R.P. Giblon**, author; **J. Daidola**, Papers chairman; **T.J. Sartor Jr.**, author; **E.D. Veltri**, Public Relations chairman, and **N.F. Pergola**, chairman.

The New York Metropolitan Section of The Society of Naval Architects and Marine Engineers opened its 1977-78 season on September 29, 1977, at the U.S. Coast Guard Officers' Club on Governors Island, New York City. This was also Past Chairman's Night. The Section chairman, **Nicola F. Pergola**, formally opened the meeting by introducing the past chairmen who were present. Mr. Pergola presented **Arnold Stein**, last year's chairman, with a certificate of appreciation from the SNAME national office, and a plaque and lapel pin on behalf of the Metropolitan Section.

The Papers Committee chairman, **John Daidola**, began the technical session by introducing **Thomas J. Sartor Jr.**, Farrell Lines Incorporated, and **Robert P. Giblon**, George G. Sharp, Inc., who jointly presented the paper "85' Class Container Ships."

This paper described the four

original Farrell Lines C6-Class containerships constructed at Litton Systems Divisions of Litton Industries, Pascagoula, Miss., and in addition, covered the lengthening by 144 feet (44 meters) of two of these ships to C8-Class at Avondale Shipyards, Inc. The paper also described two additional C8-Class ships presently building at the Bethlehem Steel Shipyard at Sparrows Point, Md., which will be the largest to be built in the United States.

Novel features of these ships were illustrated in a slide and movie presentation. Among the features described were a direct expansion over-feed refrigeration system; an on-deck container securing system that eliminates the need for lashing and at the same time provides flexibility as to the number of containers carried on deck; new refrigerated space insulations, and a high-efficiency automated type powerplant.



Past chairmen shown above, left to right: (rear) **W.I. Signell**, **E.A. Catlin**, **E.E. MacLeish**, **M.D. Macpherson**; (middle) **L.S. McCready**, **T.J. Sartor Jr.**, **R.P. Fulton**, **A.M. Stein**; (front) **L. Rosenblatt**, **R.P. Giblon**, and **C.A. Narwicz**.

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Fourteen Papers To Be Presented At

SNAME 85th Annual Meeting

The 85th Annual Meeting of The Society of Naval Architects and Marine Engineers will convene at the New York Hilton Hotel on November 10-12, 1977, it was announced by **Robert T. Young**, president of the Society.



Robert T. Young

"This is by far the Society's largest annual event," he said, "with more than 2,000 people from all segments of the maritime industry gathering to hear the technical presentations. Many will take part in the luncheon, banquet, and dinner-dance as well."

At the simultaneous technical sessions on November 10 and 11, fourteen papers will be presented with subjects of enough variety to interest all the attendees.

President **Young** will give his annual address at the President's Luncheon in the Sutton Ballroom on Thursday, November 10. Featured on the program will be the presentation of several important awards.

Later in the afternoon, at 4 p.m., the annual Business Session will be held, where the members will act on proposed amendments to the Society's bylaws.

On Friday evening, November 11, the Annual Banquet will take place in the Grand Ballroom of the Hilton, with Mr. **Young** presiding. This is the most traditional part of the Annual Meeting, where the Society's highest awards are presented, and a major address is given.

The David W. Taylor Medal "For Notable Achievement in Naval Architecture and Marine Engineering" will be awarded to **James J. Henry**, chairman of the board of J.J. Henry Co., Inc., New York, N.Y. The Vice Admiral "Jerry" Land Medal "For Outstanding Accomplishment in the Marine Field" will be given to **E. Scott Dillon**, who was for 35 years with the U.S. Maritime Administration.

The banquet speaker this year will be **Allen E. Schumacher**, chairman of the board, American

Hull Insurance Syndicate, New York.

On Saturday night, the Grand Ballroom will again be the setting for the annual Dinner-Dance, always a gala occasion and a fitting conclusion to the Annual Meeting.

The 14 technical papers to be presented are:

Paper No. 1 — "Hydrodynamic Design Basis for Navy Ship Roll Motion Stabilization" by **Geoffrey G. Cox** and **Adrian R. Lloyd**.

Synopsis—The hydrodynamic basis for the design and performance evaluation of navy ship roll stabilizers is covered in some detail, including the necessary background material. Major attention is devoted to antiroll fin/bilge keel systems, and procedures are illustrated by examples where possible, with the necessary analytical methods provided in the appendices. Also noted are the results of ship trials, model experiments and theoretical developments which have contributed to the present state of knowledge.

Paper No. 2—"Prediction of Motion, Stability, and Wave Load of Small - Waterplane - Area, Twin-Hull Ships" by **Choung M. Lee** and **Richard M. Curphey**.

Synopsis — Analytical methods for predicting motion in waves, vertical-plane stability, and wave loads of small - waterplane - area, twin-hull (SWATH) ships are presented. Correlation of analytical results with model experimental results is made, and pertinent discussions about the validity of the analytical methods are presented. The correlation demonstrates that the major dynamic characteristics of a SWATH ship can be reliably predicted by the analytical methods presented.

Paper No. 3—"On the Application of Hull Surveillance Systems for Increased Safety and Improved Structural Utilization in Rough Weather" by **K. Lindemann**, **J. Odland** and **J. Strengehagen**.

Synopsis — Common design practice together with hull surveillance systems are considered. Threshold wave load levels for vertical acceleration and vertical bending moment are established. A handling aid module presenting wave load patterns is developed. The concept of probabilistic design based on a proposed strength distribution is introduced. A suggested hull surveillance system has been worked out, where curves for the probability of failure are constructed.

Paper No. 4 — "Dynamic Response of Large Great Lakes Bulk Carriers to Wave-Excited Loads" by **S.G. Stiansen**, **A.E. Mansour** and **Y.N. Chen**.

Synopsis — Large bulk carriers operating in the Great Lakes represent a class of ships in which springing is more important than in oceangoing ships due to the unique characteristics of load and configuration. For this reason, some emphasis should be given to this phenomenon in the design of large Great Lakes vessels. The paper describes an extensive ABS research program, including the development of the SPRINGSEA II computer program, correlation of full-scale measurements, general trend studies and some design considerations.

Paper No. 5 — "Design of the First Generation of 550,000-dwt Tankers" by **A. Laredo**, **D. Beghin** and **M. Garguet**.

Synopsis — Designing the first generation of 550,000-dwt tankers required research in the fields of hull structure and hydrodynamics, which is described in this paper. Factors which led to the selection of the twin-screw, twin-rudder arrangement are outlined, and some results of sea trials are given.

Paper No. 6 — "Maritime Fuel Conservation" by **Edward V. Lewis**, **Jose Femenia** and **Robert B. Zubaly**.

Synopsis—The results of a three-year survey of means for fuel conservation in the maritime industry are summarized. Topics covered include ship operational practices — speed reduction and rationalization of schedules — increasing the efficiency of hulls, powerplants and propellers, improved navigation aids, and a search for alternative fuels. A broad industry / government fuel conservation plan is formulated.

Paper No. 7 — "Improved Marine Boiler Reliability" by **John R. Brinser** and **Carl F. Horlitz Jr.**

Synopsis — This paper presents the results of recently completed R&D and descriptions of ongoing research and development efforts, sponsored by the Maritime Administration, for the purpose of improving marine boiler reliability. Topics covered include high and low temperature corrosion, furnace, superheater and oil burner design parameters and an investigation of present-day bunkering fuels.

Paper No. 8—"Increased Profits for Gas-Turbine Container-ships by Unique Applications of

Combustion Technology and Hydrodynamics" by **S. Michael Novak**, **Piet W.C.M. Van Oirschot**, **H. Peter Young** and **David A. O'Neil**.

Synopsis—Dramatic increases in fuel prices have created unparalleled challenges to shipowners to maintain healthy profits. This paper reports on the conversion of Seatrain Lines' gas turbine twin-screw containerhips and the developments which enabled bold modifications to burn blended residuals and the radical modification of one propeller. The economic benefits are included.

Paper No. 9 — "Stack Design Technology for Naval and Merchant Ships" by **Gary J. Baham** and **Donald N. McCallum**.

Synopsis — The authors discuss design techniques for surface ship stack casings and exhaust duct terminals. Traditional engineering problems associated with stack design are addressed and solutions given. The experimental data base for the design practices in plume prediction and stack gas temperature prediction is presented and discussed. An example is introduced. The appendix contains data from recent full-scale ship trials.

Paper No. 10 — "Modular Payload Ships in the U.S. Navy" by **J.W. Abbott**.

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SNAMC Annual Program

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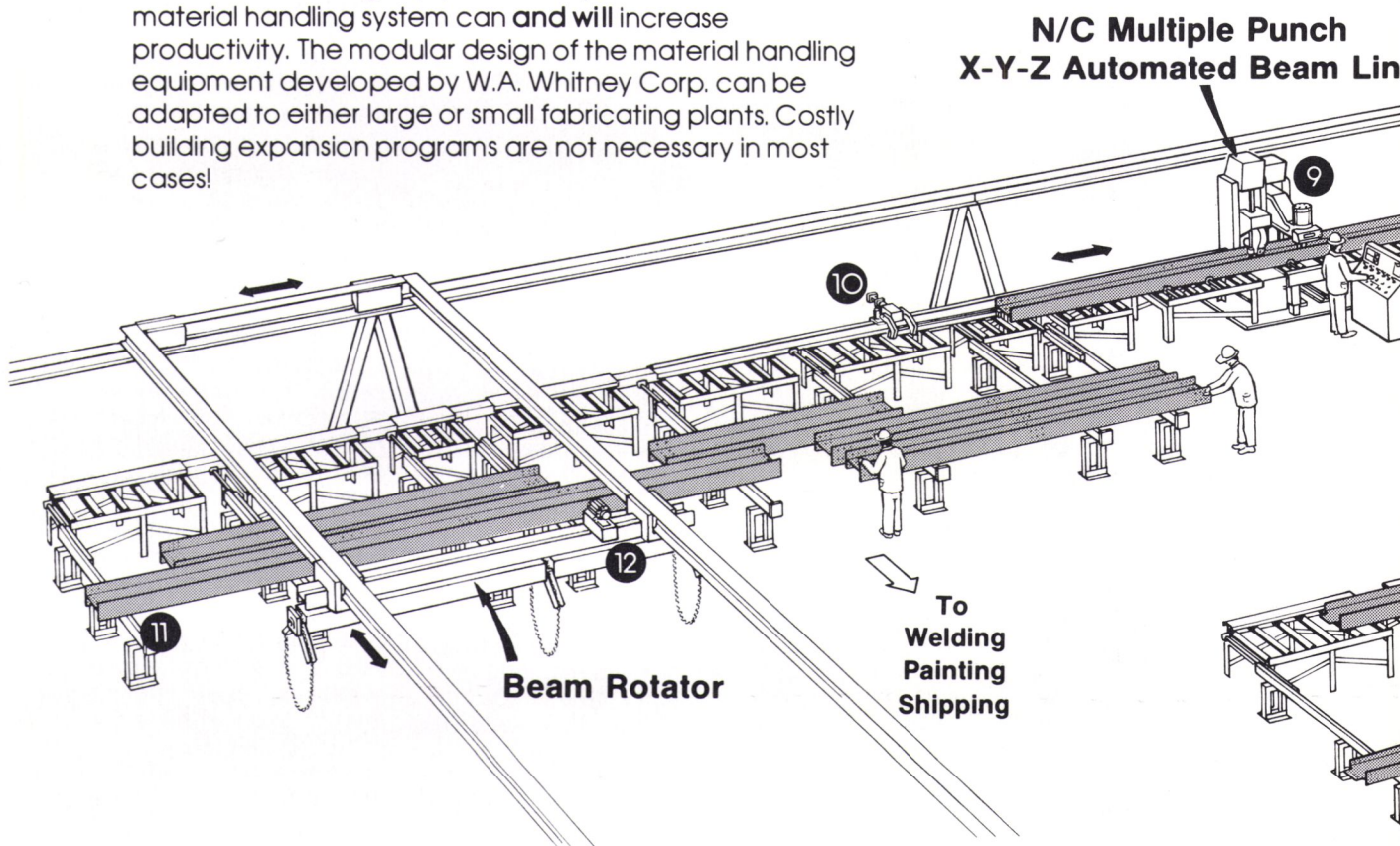
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The benefits are expected to include a significant improvement in propulsive efficiency that could save about 10 percent of the fuel consumed on a typical ship. This

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McAllister Brothers Names Donald Hankin VP-Engineering



Donald C. Hankin

Donald C. Hankin, marine superintendent

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Improving Shipbuilding Productivity

The National Shipbuilding Research Program Was Developed By The Maritime Administration And The Society Of Naval Architects And Marine Engineers To Serve All U.S. Shipbuilders.

L.D. Chirillo *

Fourteen Papers To Be Presented At

SNAME 85th Annual Meeting

The 85th Annual Meeting of The Society of Naval Architects and Marine Engineers will convene at the New York Hilton Hotel on November 10-12, 1977, it was announced by **Robert T. Young**, president of the Society.



Robert T. Young

"This is by far the Society's largest annual event," he said, "with more than 2,000 people from all segments of the maritime industry gathering to hear the technical presentations. Many will take part in the luncheon, banquet, and dinner-dance as well."

At the simultaneous technical sessions on November 10 and 11, fourteen papers will be presented with subjects of enough variety to interest all the attendees.

President **Young** will give his annual address at the President's Luncheon in the Sutton Ballroom on Thursday, November 10. Featured on the program will be the presentation of several important awards.

Later in the afternoon, at 4 p.m., the annual Business Session will be held, where the members will act on proposed amendments to the Society's bylaws.

On Friday evening, November 11, the Annual Banquet will take place in the Grand Ballroom of the Hilton, with Mr. **Young** presiding. This is the most traditional part of the Annual Meeting, where the Society's highest awards are presented, and a major address is given.

The David W. Taylor Medal "For Notable Achievement in Naval Architecture and Marine Engineering" will be awarded to **James J. Henry**, chairman of the board of J.J. Henry Co., Inc., New York, N.Y. The Vice Admiral "Jerry" Land Medal "For Outstanding Accomplishment in the Marine Field" will be given to **E. Scott Dillon**, who was for 35 years with the U.S. Maritime Administration.

The banquet speaker this year will be **Allen E. Schumacher**, chairman of the board, American

Hull Insurance Syndicate, New York.

On Saturday night, the Grand Ballroom will again be the setting for the annual Dinner-Dance, always a gala occasion and a fitting conclusion to the Annual Meeting.

The 14 technical papers to be presented are:

Paper No. 1 — "Hydrodynamic Design Basis for Navy Ship Roll Motion Stabilization" by **Geoffrey G. Cox** and **Adrian R. Lloyd**.

Synopsis—The hydrodynamic basis for the design and performance evaluation of navy ship roll stabilizers is covered in some detail, including the necessary background material. Major attention is devoted to antiroll fin/bilge keel systems, and procedures are illustrated by examples where possible, with the necessary analytical methods provided in the appendices. Also noted are the results of ship trials, model experiments and theoretical developments which have contributed to the present state of knowledge.

Paper No. 2—"Prediction of Motion, Stability, and Wave Load of Small - Waterplane - Area, Twin - Hull Ships" by **Choung M. Lee** and **Richard M. Curphey**.

Synopsis — Analytical methods for predicting motion in waves, vertical-plane stability, and wave loads of small - waterplane - area, twin-hull (SWATH) ships are presented. Correlation of analytical results with model experimental results is made, and pertinent discussions about the validity of the analytical methods are presented. The correlation demonstrates that the major dynamic characteristics of a SWATH ship can be reliably predicted by the analytical methods presented.

Paper No. 3—"On the Application of Hull Surveillance Systems for Increased Safety and Improved Structural Utilization in Rough Weather" by **K. Lindemann**, **J. Odland** and **J. Strengehagen**.

Synopsis — Common design practice together with hull surveillance systems are considered. Threshold wave load levels for vertical acceleration and vertical bending moment are established. A handling aid module presenting wave load patterns is developed. The concept of probabilistic design based on a proposed strength distribution is introduced. A suggested hull surveillance system has been worked out, where curves for the probability of failure are constructed.

Paper No. 4 — "Dynamic Response of Large Great Lakes Bulk Carriers to Wave-Excited Loads" by **S.G. Stiansen**, **A.E. Mansour** and **Y.N. Chen**.

Synopsis — Large bulk carriers operating in the Great Lakes represent a class of ships in which springing is more important than in oceangoing ships due to the unique characteristics of load and configuration. For this reason, some emphasis should be given to this phenomenon in the design of large Great Lakes vessels. The paper describes an extensive ABS research program, including the development of the SPRINGSEA II computer program, correlation of full-scale measurements, general trend studies and some design considerations.

Paper No. 5 — "Design of the First Generation of 550,000-dwt Tankers" by **A. Laredo**, **D. Beghin** and **M. Garguet**.

Synopsis — Designing the first generation of 550,000-dwt tankers required research in the fields of hull structure and hydrodynamics, which is described in this paper. Factors which led to the selection of the twin-screw, twin-rudder arrangement are outlined, and some results of sea trials are given.

Paper No. 6 — "Maritime Fuel Conservation" by **Edward V. Lewis**, **Jose Femenia** and **Robert B. Zubaly**.

Synopsis—The results of a three-year survey of means for fuel conservation in the maritime industry are summarized. Topics covered include ship operational practices — speed reduction and rationalization of schedules — increasing the efficiency of hulls, powerplants and propellers, improved navigation aids, and a search for alternative fuels. A broad industry / government fuel conservation plan is formulated.

Paper No. 7 — "Improved Marine Boiler Reliability" by **John R. Brinser** and **Carl F. Horlitz Jr.**

Synopsis — This paper presents the results of recently completed R&D and descriptions of ongoing research and development efforts, sponsored by the Maritime Administration, for the purpose of improving marine boiler reliability. Topics covered include high and low temperature corrosion, furnace, superheater and oil burner design parameters and an investigation of present-day bunkering fuels.

Paper No. 8—"Increased Profits for Gas-Turbine Container-ships by Unique Applications of

Combustion Technology and Hydrodynamics" by **S. Michael Novak**, **Piet W.C.M. Van Oirschot**, **H. Peter Young** and **David A. O'Neil**.

Synopsis—Dramatic increases in fuel prices have created unparalleled challenges to shipowners to maintain healthy profits. This paper reports on the conversion of Seatrain Lines' gas turbine twin-screw containerhips and the developments which enabled bold modifications to burn blended residuals and the radical modification of one propeller. The economic benefits are included.

Paper No. 9 — "Stack Design Technology for Naval and Merchant Ships" by **Gary J. Baham** and **Donald N. McCallum**.

Synopsis — The authors discuss design techniques for surface ship stack casings and exhaust duct terminals. Traditional engineering problems associated with stack design are addressed and solutions given. The experimental data base for the design practices in plume prediction and stack gas temperature prediction is presented and discussed. An example is introduced. The appendix contains data from recent full-scale ship trials.

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SNAME Annual Program

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The other vessel is the M/V Reefer Star, a 3,760-gross-ton tuna fleet mothership, owned by Star-Kist Foods, Inc., Terminal Island, Calif. The application is for transfer to Star of the Pacific, S.A., a Panamanian corporation and wholly owned subsidiary of Star-Kist. The vessel would be operated under Panamanian registry and flag.

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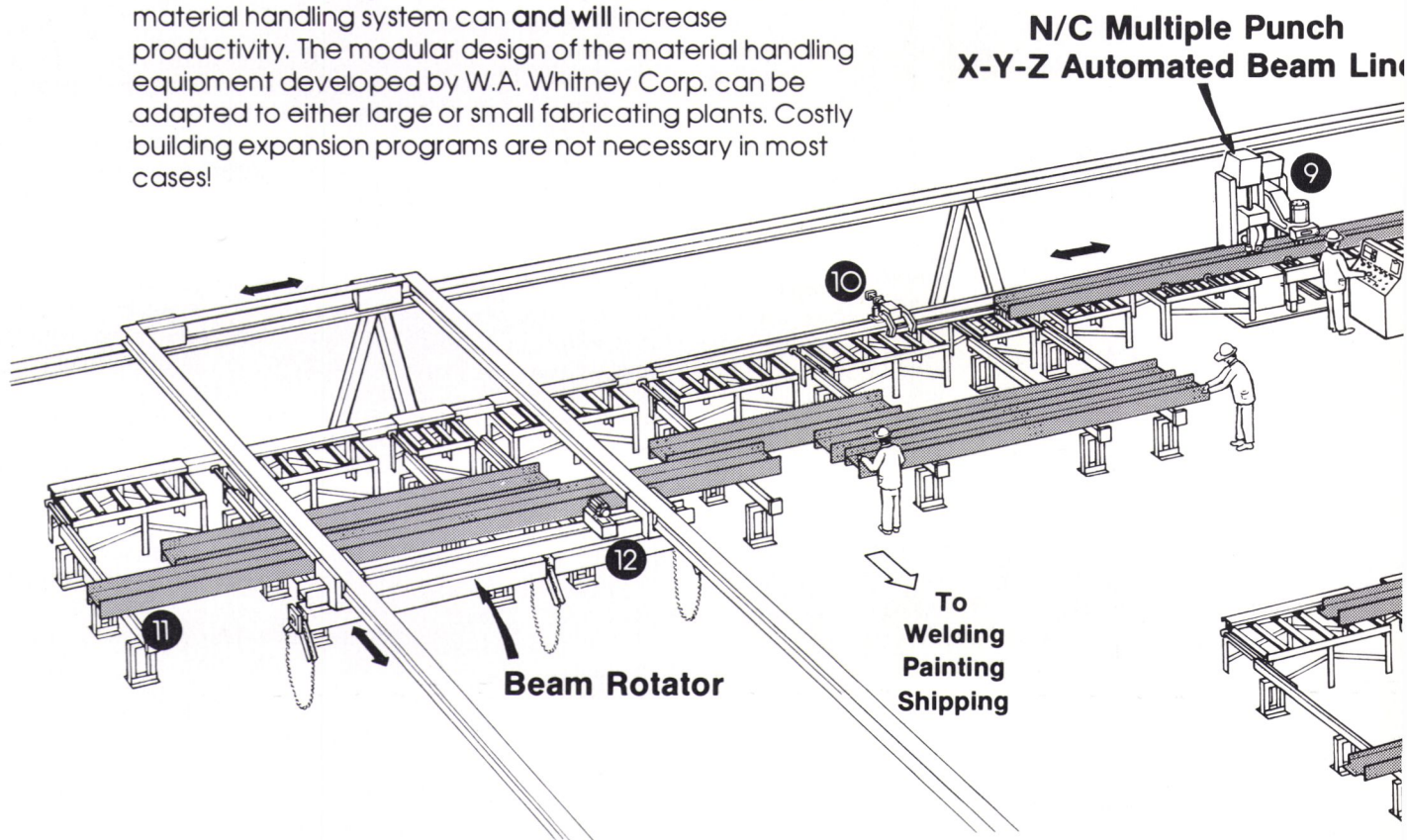
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Component parts and their functions are listed in operational sequence:

- 1 **Raw Stock Feed Rack** — holds up to 40 beams which are sequenced by priority for utmost efficiency.
- 2 **Control Panel** — for operating feed rack, conveyors, saw gaging, short drop unloader and storage area of beam transfer conveyor.
- 3 **Powered Conveyors** — provide rapid forward and reverse movement of material.
- 4 **Cold Saw.**
- 5 **Saw Gaging System** — provides accurate linear measurement for cutting operation.
- 6 **Beam Unloader & Storage Rack** — for removal of stub ends of cut-to-length beams.
- 7 **Beam Transfer** — stores beams requiring punching.
- 8 **Control Console** — moves beams onto infeed conveyors, operates all functions of the Beamline and removal of completed material.

Maritime Reporter/Engineering News

American Export Lines \$43.1-Million Title XI Approved By MarAd

The Maritime Administration (MarAd) has approved Title XI loan guarantees totaling \$43.1 million to aid American Export Lines, Inc. in financing two containerhips on order at the Bath (Maine) Iron Works Corporation

shipyard, and refinancing two combination container-roll-on/roll-off vessels currently in service.

An \$84.4-million contract for construction of the new containerhips, each 610 feet long and 16,300 deadweight tons, was announced October 29, 1976.

Letter commitments to guarantee obligations under Title XI of the Merchant Marine Act of 1936, as amended, were authorized by

the agency for the two new vessels when the construction contract was announced and for the two ro/ro vessels, the Red Jacket and the Young America, last April 12.

Title XI financing has been arranged for the two containerhips in the amount of \$17,450,000 each. The commitment for the Red Jacket is \$4,073,000, and for the Young America, \$4,148,000.

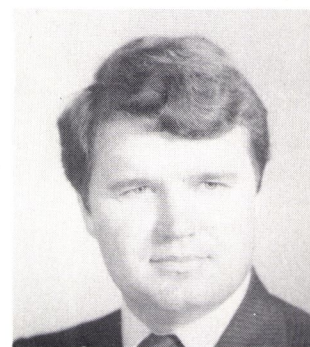
Proceeds from bonds sold in refinancing the ro/ros will be used as equity in building the containerhips at Bath.

The Red Jacket and Young America were built in 1969 and 1970, respectively, at Ingalls Shipbuilding Division, Pascagoula, Miss., and were acquired by AEL in 1970 from Moore-McCormack Lines, Inc. They currently are operated in trade linking U.S. Atlantic ports with the Mediterranean—the same service for which the two containerhips on order are intended.

The Title XI loan guarantee program is designed to attract private investment capital to the U.S. maritime industry.

American Export Lines, Inc., a steamship company with headquarters in New York, N.Y., reported in August increased revenues and net earnings equal to 83 cents a share for the first half of 1977.

Douglas Oehrlein Joins Dravo SteelShip Corp.



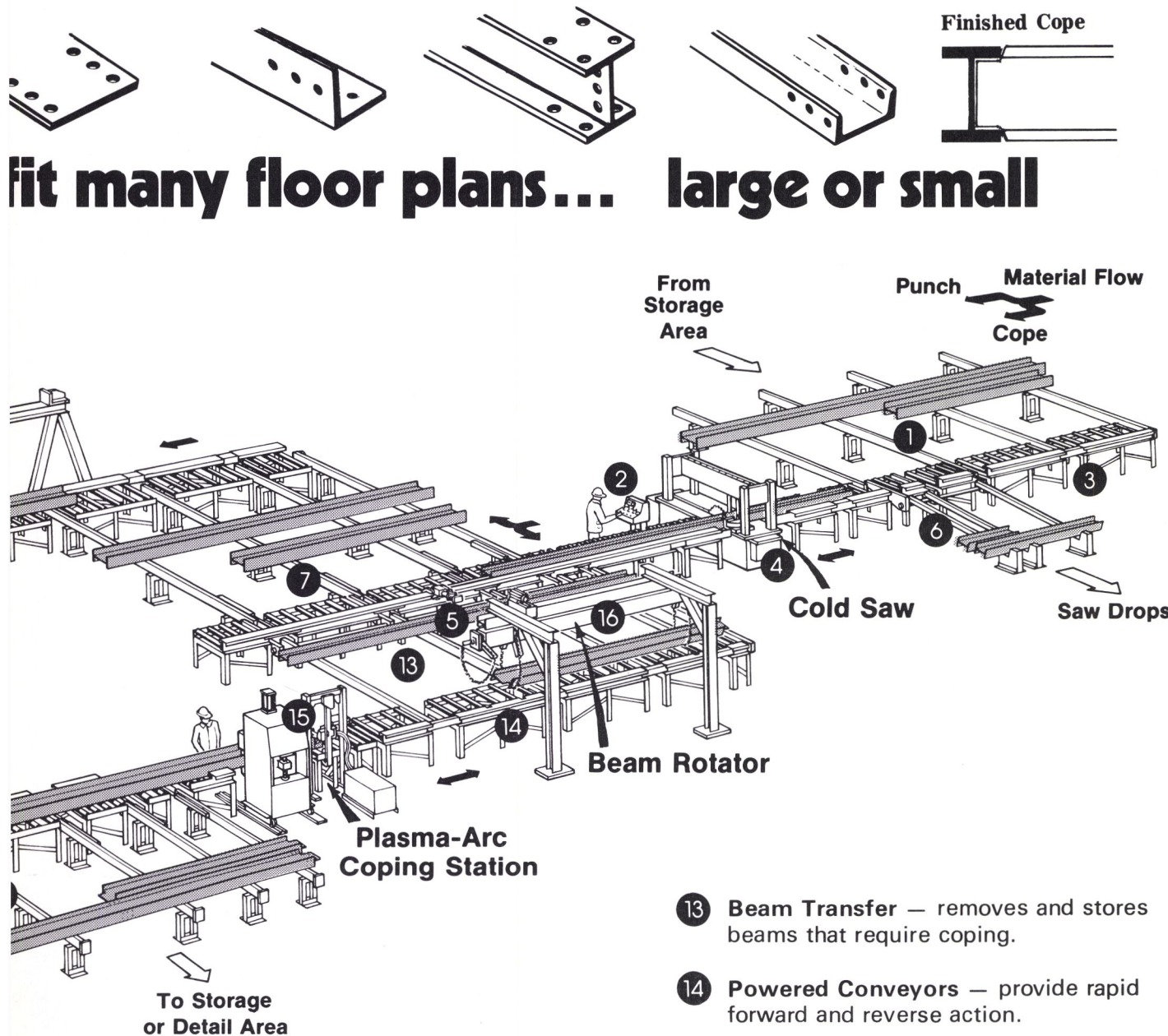
Douglas L. Oehrlein

Douglas L. Oehrlein has been appointed marketing director for the Pine Bluff, Ark., shipyard of Dravo SteelShip Corporation. The appointment was announced by Edward D. Fry, vice president/general manager of Dravo SteelShip.

Mr. Oehrlein is a graduate of the University of Hawaii, where he obtained his B.S. degree in mechanical engineering with a specialty in marine structures. He has held marketing positions with Tidewater, Inc., and most recently was marketing manager for Avondale Shipyards of New Orleans, La.

Dravo SteelShip is a subsidiary of Dravo Corporation, Pittsburgh, Pa., an international engineer constructor with more than 85 years' experience in the marine industry. Dravo SteelShip, located at Mile 73 on the Arkansas River, specializes in the construction of both steel and aluminum commercial vessels up to 200 feet in length.

For more information on Dravo SteelShip's tugs, pushboats, supply boats, or other work vessels, write Dravo SteelShip Corporation, Route 4, Box 167, Pine Bluff, Ark. 71602. Gulf Coast customers can telephone Mr. Oehrlein at 504/722-6677 for quick response.



- 9 Multiple Punch Beamline Fabricator — punches holes in web section and rear flange of beams in one pass.
- 10 "Positrak" Gaging Carriage — provides quick linear positioning.
- 11 Beam Unloader & Storage Rack — holds fabricated beams for removal or detail work.
- 12 Structural Shape Rotator — mounted on rails to facilitate handling of beams requiring fabrication of the front flange; repositioning for detail work; or coping.

- 13 Beam Transfer — removes and stores beams that require coping.
- 14 Powered Conveyors — provide rapid forward and reverse action.
- 15 Automated Beam Coping Machine — contains cutting torch and coping press combination.
- 16 Structural Shape Rotator — turns beams for cutting of opposite flange.
- 17 Beam Unloader & Storage Rack — holds completed cut beams.

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**McAllister Brothers
Names Donald Hankin
VP-Engineering**



Donald C. Hankin

Donald C. Hankin, marine superintendent for McAllister Brothers in the ports of New York, Philadelphia, Norfolk, San Juan and overseas operations, has been appointed to the additional position of vice president-engineering.

He will continue in his present position, as well as supervise the design and construction of new equipment and a staff consisting of the design engineer and port engineers and captains in these ports.

Mr. Hankin joined the 113-year-old marine towing and transportation company in 1968 as superintendent of new construction and since that time has steadily advanced to other positions, including general manager of McAllister's ship repair yard in Jersey City. In his new office, he will no longer manage the repair yard in order to devote more time to new construction and maintenance of the expanding McAllister fleet.

Mr. Hankin began his career in 1941 at the New York Ship-

building Corp. in Camden, N.J. After serving in the U.S. Navy, he joined the Cramp Shipbuilding Company as sheet metal quartermaster. Thereafter, he joined R.T.C. Shipbuilding Corporation in its design and engineering department, where he subsequently became chief engineer.

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**French Yards Receive
\$640 Million To Build
Five Ships For Malaysia**

Malaysia has confirmed an order placed with French shipyards for five methane carriers of 130,000-cubic-meter capacity.

The giant methane carriers, costing more than \$128 million each, will be delivered in 1980 and 1981 to transport Malaysian gas to Japan.

The multimillion-dollar contract went to two French shipbuilding groups — Chantiers France-Dunkerque and Constructions Navales et Industrielles de la Mediterranee. The former is based in Dunkirk and the latter at La Seyne, in southern France, near Marseilles.

French yards got the order after according Malaysia exceptionally attractive financial conditions. Notably, there is a two-year grace period on payments.

Already well endowed in such raw materials resources as rubber, palm oil and tropical timber, Malaysia has appreciable oil and gas reserves. The methane gas deposits are located offshore near Sarawak in a concession area awarded to Shell oil.

Improving Shipbuilding Productivity

**The National Shipbuilding Research Program
Was Developed By The Maritime
Administration And The Society Of
Naval Architects And Marine Engineers
To Serve All U.S. Shipbuilders.**

L.D. Chirillo *

The singular characteristic of the National Shipbuilding Research Program is its focus only on making the shipbuilding process more productive. Specifically, each of its many projects attempts only to cause a net reduction in the four essential shipbuilding resources, i.e., manpower, material, facilities and time. In pursuit of this self-serving objective in the research category "Outfitting and Production Aids," which consists of many diverse projects, unprecedented and important relationships evolved. These led to a strategy, growing in sophistication, which addresses the concerns of and frequently benefits other interested parties.

One prerequisite for the strategy results from the organization of the National Shipbuilding Research Program. The program acquires research subjects and guidance from The Society of Naval Architects and Marine Engineers' Ship Production Committee, whose membership represent all shipbuilders. Management of the research is decentralized, by categories, among a number of shipbuilding firms. Program managers assigned by the latter are virtually free to visit in all shipyards to both acquire and disseminate ideas for productivity improvements. Because of this, there is sufficient acceptance that the R&D program managers, although employed by different corporations, have credibility as representatives of the entire U.S. shipbuilding industry.

One of the first research projects undertaken, perhaps the simplest, furnished the most significant insight. The objective was to develop an acceptable electric-cable connection device which would satisfy the requirements for modular construction. That is, it would permit "prewiring" of separately constructed deck houses, ships built in halves, etc. Initial inquiries disclosed that

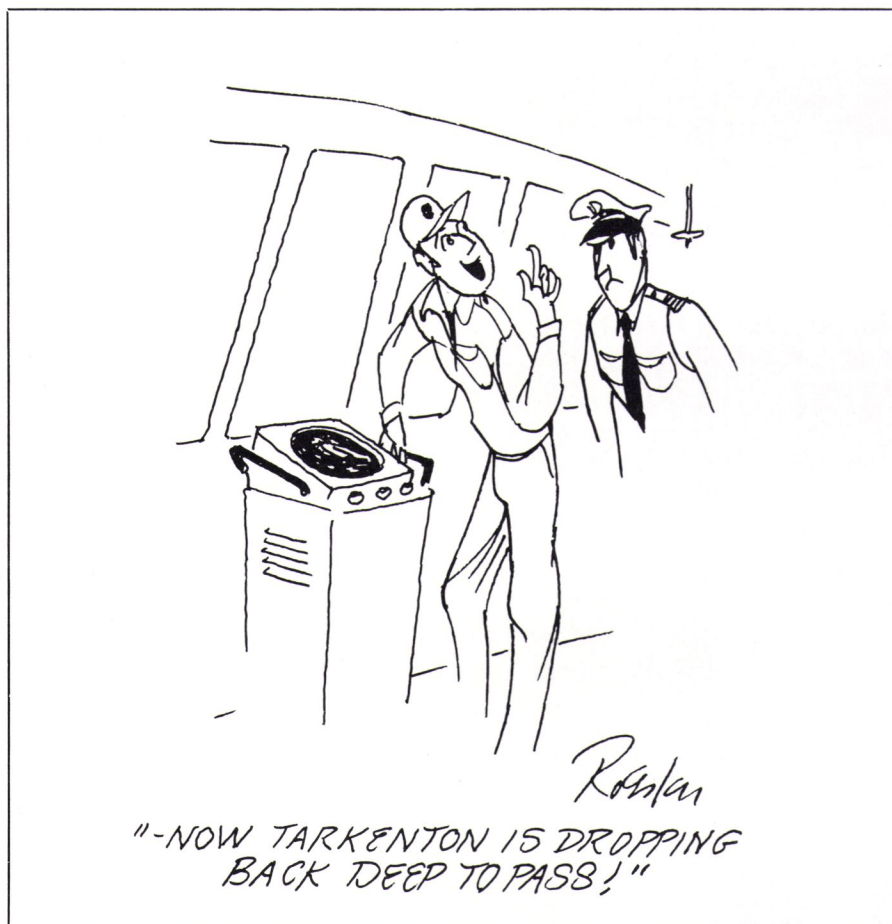
apparently sufficient technology already existed, e.g., locked-cycle hydraulic tools for applying butt connectors and heat-shrink or prestretched tubing for restoring cable insulation and jackets. Further, it was learned that such splices were already being used in mines, aircraft and nuclear powerplants and that the U.S. Coast Guard (CG) had permitted a nominal number of electric-cable splices in ships in order to establish reliance based upon service experience. The inquiry also disclosed that applied research and systematic analysis are techniques recognized by ship classification societies for creating assurances commensurate with advancement in the marine industry in a more timely manner.

Accordingly, the research, performed by the Applied Physics Laboratory at the University of Washington, was directed to show that permitting more extensive cable splicing using existing methods does not present a hazard to a vessel or its personnel. The applicable request for approval was submitted and within four months a CG letter providing interim guidelines for immediate implementation was received. This was supplemented by a change to the Code of Federal Regulations (CFR) which specifically notes that splices are permitted to facilitate the shipbuilding process, ship modification and ship repair. The American Bureau of Shipping (ABS) invoked similar provisions. General adoption of splices was accelerated by the vigorous marketing efforts of an interested supplier, AMP Special Industries.

The supplier's role should not be underestimated. This is illustrated by another research project which produced a water-based cement, poured-type seal for the transit of electric cables through bulkheads and decks. It employs a simple technique for a dam and is approved as fireproof, watertight and ratproof. Although it is already installed in at least two ship classes, implementation is not as rapid as for splices. Primarily, there is no supplier providing a marketing effort as performed for splice materials.

Alternatives to dangerous and expensive radiographic testing

*Mr. Chirillo, R&D program manager, Todd Shipyards Corporation, Seattle (Wash.) Division, presented the paper condensed here before a recent meeting of the Northern California Section of The Society of Naval Architects and Marine Engineers. Copies of the complete paper may be obtained from the secretary of the Section.



(RT) were investigated three years ago. This included evaluating of acoustic emissions and acoustic holography. Ultrasonic testing (UT), already in extensive use for naval work and provisionally allowed by ABS, was confirmed to be the only suitable alternative.

ABS hull-weld inspection requirements were evaluated in the context of inspection practice, failure histories, ductile rupture and brittle fracture probability, and a simplified fatigue crack-growth analysis.

The researcher's identification of the UT checkpoint length which yields "the same order of reject rate as for RT" suggests that ABS qualified plate, welders and weld procedures are sufficient to justify acceptance of weld quality based upon random sampling and application of statistical laws. Shipbuilders who achieve consistently good welds would inspect less.

This view was supported by a recent description of a Failure Analysis Associates' (FAA) report. "When a supertanker developed welding cracks during construction, the firm was asked to determine whether similar cracks might occur in an already launched sistership and result in disaster. Using statistical analysis, FAA reported that the risk involved in continuing to operate the sistership without modification was acceptable."

Thus, there is already substantial thinking that suggests research to develop a statistical approach for assessing weld quality. Since statistics is a form of applied mathematics, it is a logical tool to use for increasing owner, regulator and shipbuilder UT assurances while opening the way to more improvements in productivity.

Another project was undertaken to reduce the cost of shipboard electrical installations by expanded use of less costly and readily available material from the larger electrical equipment markets that exist for general, residential and specialized (tank farms, mines, etc.) construction industries. By this time the research management had adopted the same format for proposed changes to the Code of Federal Regulations (CFR) as used by headquarters members of the CG. The reason being to perform every logical task, even administrative in addition to applied research and analysis, that would facilitate a regulator's understanding.

The main emphasis of these requests is on the necessity to adopt standards of the National Electric Code (NEC) and National Electric Manufacturer's Association (NEMA) unless there is an absolutely manifest need peculiar to ships and/or the shipbuilding process. Traditionalists

and some suppliers who are devotees of the generality "commercial marine practice" are upset by the growing knowledge that the electrical equipment requirements of other industries, petrochemical for example, are frequently much more severe than those of the marine industry. More of such knowledge obtained through applied research and analysis and widely disseminated is the only way to counter their negative reactions.

The CG is encouraging requests resulting from the research because they show that shipbuilders are collectively doing their "homework" instead of expressing frustration with the CFR. Further, the CG already has mechanisms for public participation in rule making as is now being demanded in Congress. No matter what the

mechanisms are, they cannot do anything without responsible input. The shipbuilders' collective thinking is included in such input through guidance furnished by the Ship Production Committee. An added degree of responsibility is the wide distribution of such requests to the industry, via the Ship Production Committee, to (continued on page 16)

The Veterans

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ton VLCC's, ore loading terminals and many other large structures.

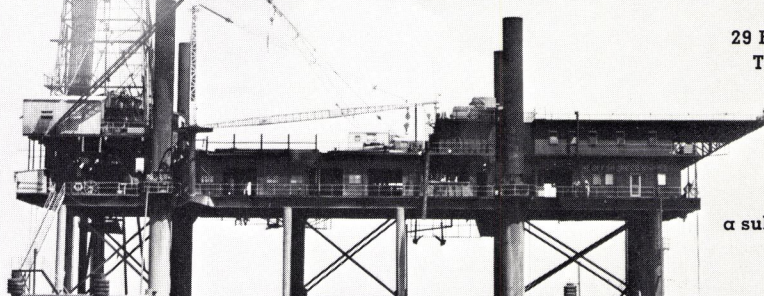
This broad engineering/construction background enables DeLong to design around the most cost-effective fabrication techniques. But most important, DeLong has unexcelled engineering capabilities for the marine environment—experience over, on and under the sea.

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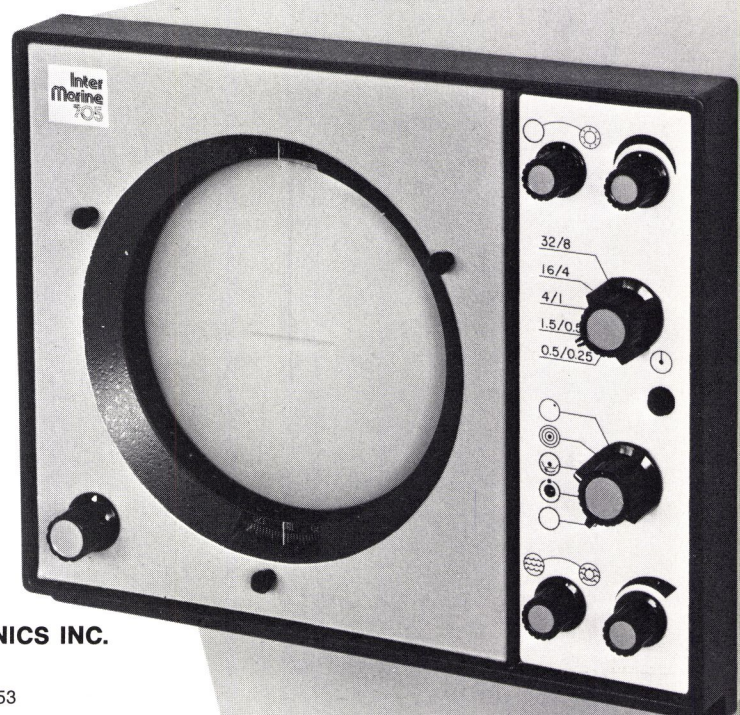


Value/the Intermarine 705

Each of the many small radars on the market today has its claim — the best, newest, most affordable, longest range, highest power, and so on.

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Improving Shipbuilding

(continued from page 15)

ABS and to the Maritime Administration.

The CG has proposed research, to be jointly funded with MarAd and implemented by the National Shipbuilding Research Program, which would produce the standard needed to establish perform-

ance requirements. It would anticipate everything electric cable in ships must endure during construction, service, and when exposed to fire and flooding.

In addition, the CG has proposed a survey to list new and existing cable types; development of tests for determining if cable is acceptable in accordance with the performance standard, and evaluation of the performance

standard by applying the tests to the cable listed; thus, a list of acceptable cable would be an end product.

The same four-task approach is already incorporated in recommendations resulting from research on the use of plastics in ships. They propose similar performance standards and tests for plastic pipe systems and for the epoxy chocks used to align ma-

chinery. Usage in ships is now inhibited because what plastic pipe and chocks are expected to endure during installation and service has not been adequately described to polymer suppliers. Thus, the suppliers have not sufficiently described the properties of their plastic products to permit design with the same assurances that exist from knowledge of metals.

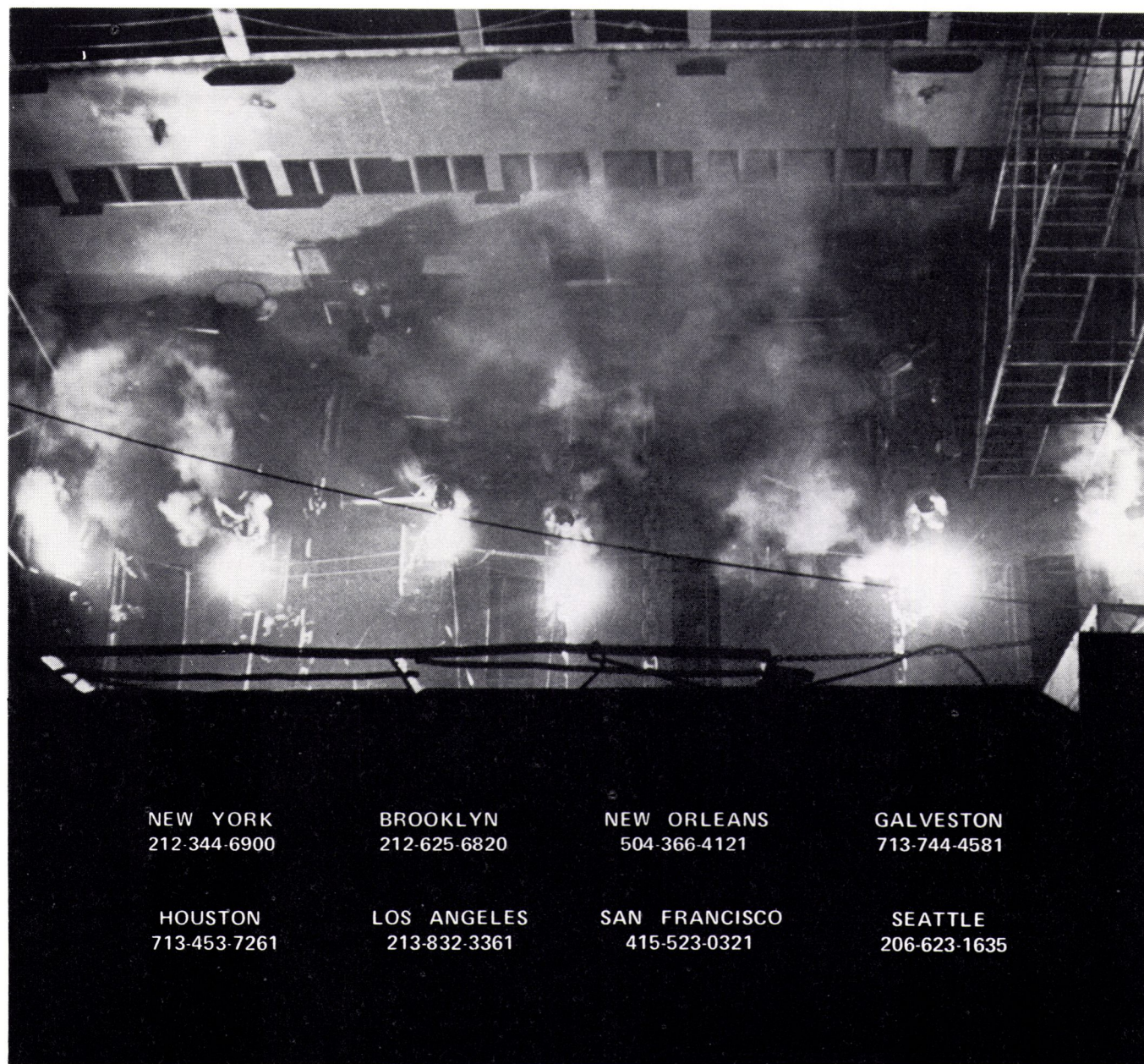
The plastic research is disclosing facts which encourage more dialogue between polymer suppliers, regulators, owners and shipbuilders. Unlike steel, plastics are light in weight, do not rust "like hell" in seawater nor in certain acids, are nonconductive but can be made conductive, are less energy intensive, and do not impose "in-process" problems with glare, fumes and noise.

Other research projects proposed, underway, and completed are also of significance to owners, regulators, designers and suppliers. These address multiplexing, rectangular vent-duct standards, tank testing and photogrammetry. Multiplexing has not yet been started. The rectangular vent-duct standards, already published, improves productivity by identifying the minimum necessary components and sizes. It recognizes that many custom fittings and sizes were built to design constraints which far exceed the accuracy of basic flow factors.

Tank testing research is currently being implemented by Southwest Research Institute.

The initial phase of photogrammetry, i.e., obtaining reliable information about physical objects by measuring photographic images, is completed. The report entitled "Photogrammetry in Shipbuilding" was issued in July 1976 by the National Shipbuilding Research Program. The technique is already in "solid" implementation in shipbuilding for producing very accurate LNG tank sounding tables, and for predicting the fit of large ships and offshore platforms built in sections. The tank-sounding tables are clearly beneficial to regulators, owners and designers, but there are other applications, not in shipbuilding per se, that should attract their interests. Accurate measurements of bow waves or hull hogging and sagging are possible. The completed research proved the feasibility of photogrammetrically acquiring accurate digital representations from scale models of ships' machinery spaces. Future research will disclose the relative costs for using the process to automatically plot pipe system arrangement and isometric drawings, and serve as the input "device" which would permit a combined pipe-systems designer/model maker to put his inherently interference-free piping arrangements into a computer. Thus, the future work by the researcher, **John F. Kenefick**, Photogram-

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eight you can count on.



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metric Consultant, Inc., should be of greater significance to designers.

The activities described herein require constant information exchanges with many people throughout the world. As a consequence the research management receives numerous requests for shipbuilding information. In a recent one-week period, non-shipbuilders who inquired included the University of Mississippi, two naval architects, and three suppliers.

Regarding suppliers, assistance is freely given, provided: a supplier's product would permit a significant net decrease in the required shipbuilding resources, i.e., manpower, material, facilities and time, and no proprietary information is involved so that everything may be freely distributed in the U.S. shipbuilding industry.

Finally, there is still another benefit to all parties in the shipbuilding process. A valuable and real end product of the National Shipbuilding Research Program is not specified anywhere. That is, in addition to producing specified end products, the Program has caused experts in various disciplines to acquire detailed knowledge of ships and the shipbuilding process. They comprise a tremendous potential for even greater advances.

British Rail Awards Ferry Contract To Harland And Wolff

Harland and Wolff shipyard in Belfast, Northern Ireland, is to build a new \$21-million ferry ship for operation on the British Rail Irish Sea service between Larne and Stranraer.

The 7,000-ton multipurpose vessel has been designed to carry 600 passengers in addition to 300 motor cars, or 60 commercial vehicles (or a mixture of both). She will have a crew of 59.

In order to speed the loading and unloading of vehicles for the short sea route, the new ferry will be fitted with two vehicle decks which can be operated simultaneously. Vehicles will be laded via a double-decker loading ramp located at the bow of the ship.

The ferry will be powered by two medium-speed diesel engines driving twin variable-pitch propellers. She will also be fitted with twin bow thruster propellers, twin stern rudders and fin stabilizers.

The vessel is due to be delivered to British Rail in time for operation on the route during the peak summer period of 1979.

With an overall length of 423 feet (128.8 meters), the new ship will have a service speed of 19 knots. Because it will have a greater draft of 15 feet (4.57 meters) than vessels currently using Stranraer Harbour in Scot-

land, dredging work will be necessary. In addition, a new berth for the ship will be constructed. Total cost of this work will be over \$6,000,000.

A British Rail shipping service has been operated between Stranraer and Larne since 1862. Currently on the service are two multipurpose vessels, the Antrim Princess and Ailsa Princess, and two chartered freight ships.

BR also operates services on five other Irish Sea routes.

NAV-COM Selected By ITT Decca Marine

NAV-COM Incorporated of North Lindenhurst, N.Y., has announced their appointment as a sales and service dealer for ITT Decca Marine, Inc. of Palm Coast, Fla.

According to NAV-COM's president Gerald A. Gutman, the company will provide sales and service support of ITT Decca prod-

ucts in the Port of New York and Long Island. With its extensive experience in electronic communications and navigation systems, NAV-COM will strengthen the ITT Decca Marine Support Network. ITT Decca Marine is a major supplier of marine radar, loran, radiotelephones, depth recorders and related equipment.

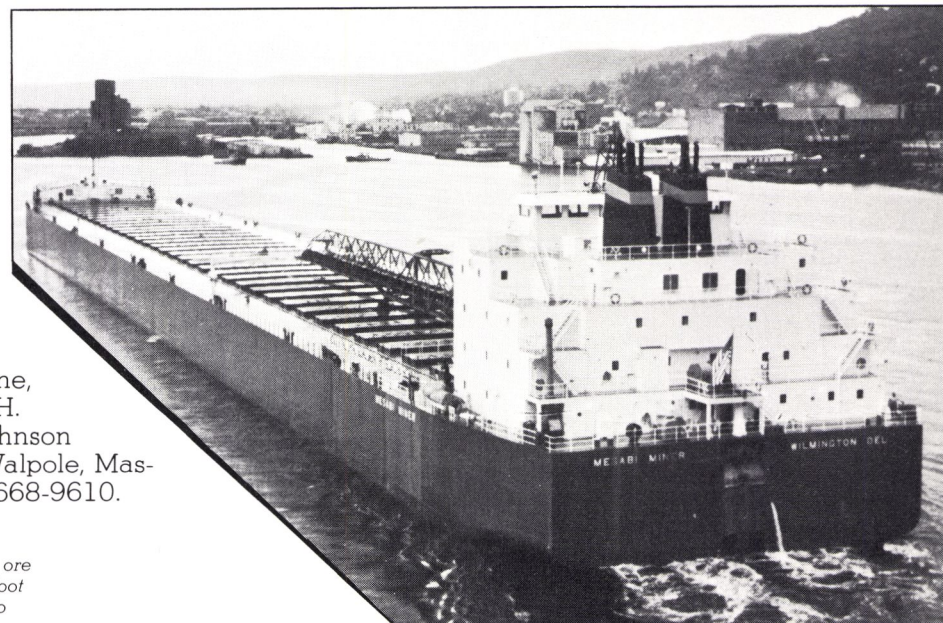
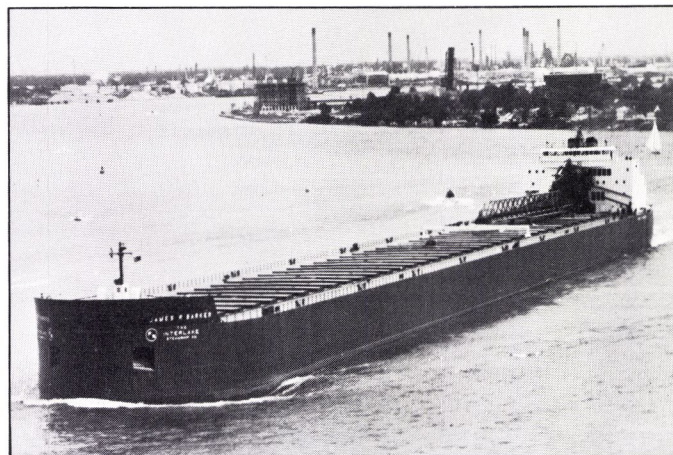
For further information, contact NAV-COM Incorporated, 2 Hicks Street, North Lindenhurst, N.Y. 11757.

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With the delivery of 58,558 gross tons of iron ore pellets to Indiana Harbor, Indiana, the 1000-foot M/V JAMES R. BARKER set the current cargo record for this trade.



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Future Opportunities And Problems Of The Barge Industry

The energy and cost effectiveness of barging supports an upbeat outlook for the industry, but "nothing succeeds without effort and nothing can be taken for granted," a leading barge executive said in speaking to a Houston, Texas, Marine Insurance Seminar. **Archie L. Wilson**, president of Dixie Carriers, Inc., said he agreed that the expansion of coal production "has been sharply oversold to the public." He said that the near-time substitute for natural gas for electric utilities would most likely be residual oil.

"Our studies indicate to us that, for the next several years, movements of residuals will continue to increase very dramatically. Some of this increase will come from importation of residuals. We can all agree, I think, that abundant cheap natural gas will no longer be available and for the immediate

future, residual oils are the only practical substitute, and barging residuals the best method of transport," Mr. Wilson said. He reported that he was converting barge equipment to carry residual oil.

Reviewing some of the industry's problems for insurance executives meeting at the Houston Oakes Hotel, Mr. Wilson singled out the lack of stability in insurance. "Of great concern to the barge industry is the tendency of many insurance companies to vacillate more today than ever before. They go in and out of markets and, from the operator's vantage point, there seems to be little stability," he said.

"When insurance coverage is required and one is told that coverage is not available at any price—that the companies have made a decision to stop writing that coverage—that is pretty bad. I think Dixie is a good company with sound operating procedures, and that has happened to us," he said.

Mr. Wilson commented that liability for spills can be "frightening." He asked whether exposures and penalties have become so great "that the government should either offer insurance or offer some other solution."

He cited an instance involving an accident by his company where the Coast Guard found Dixie "not willfully or knowingly negligent," but tried to collect \$954,000 in cleanup costs two years after the matter was thought to be closed. Mr. Wilson said the cleanup contractor recovered only 16 barrels of oil. "In fact, the water was running so fast that the cleanup was futile and a total waste of everyone's time and money." Uncertainty as to the government's position on such matters is a major problem, Mr. Wilson said.

Mr. Wilson supported the compromise bill, H.R. 8309, for a 4-cent fuel tax on the inland rivers linked to both a study of impact and the go-ahead for the reconstruction of Lock and Dam 26 at Alton, Ill.

"Water resource management, of which navigation is only one part, has been one of the government's most successful programs. The co-products of navigation—flood control, irrigation, hydroelectric power, recreation, stream flow maintenance, enhancement of fish and wildlife—and navigation itself will be more badly needed in the future than they have been in the past. Our growing population, our growing industrial and agricultural strength all depend on efficient management of a limited and nonexpandable supply of water," he said.

Mr. Wilson pointed out that the taxing power could conceivably be used to destroy the natural advantages of water transport to conserve energy and fight inflation, but he doubted that it would be so used.

"The capabilities for foolishness by government have been well enough demonstrated on all fronts, however, to make necessary a major current effort by many water-related interests, barging among them, to demonstrate once again the soundness of nearly 200 years of national effort in the water management field.

"As the economy expands, barging can be expanded with less private and public investment than that of any other mode. But nothing succeeds without effort and nothing can be taken for granted," the Dixie Carrier executive said.

Genstar Finalizes Purchase Of Gulf Of Georgia Towing Co. Ltd.

Genstar Limited, One Place Ville Marie, Montreal H3B 3R1, Canada, announced that it has finalized its purchase of Gulf of Georgia Towing Co. Ltd. of Vancouver. The company announced its intention to purchase Gulf of Georgia last July.

Gulf of Georgia Towing operates tugs and barges along the Pacific Coast and was wholly owned by **James S. Byrn** of Vancouver, who will now join Genstar in a senior management capacity.

Gulf of Georgia's marine fleet of 15 tugs and 57 barges will be integrated with Genstar's West Coast Seaspan International fleet, and will provide the company with a broader range of equipment and greater flexibility in scheduling service to customers of both companies from Mexico to Alaska.

Genstar Limited is a diversified operating company which manufactures cement, building materials, chemicals and fertilizers, and is engaged in housing, land development, commercial property development and management, construction, tug and barge transportation, shipbuilding and ship repairs, import-export of industrial minerals, and venture capital investment.

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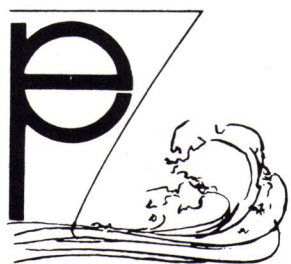
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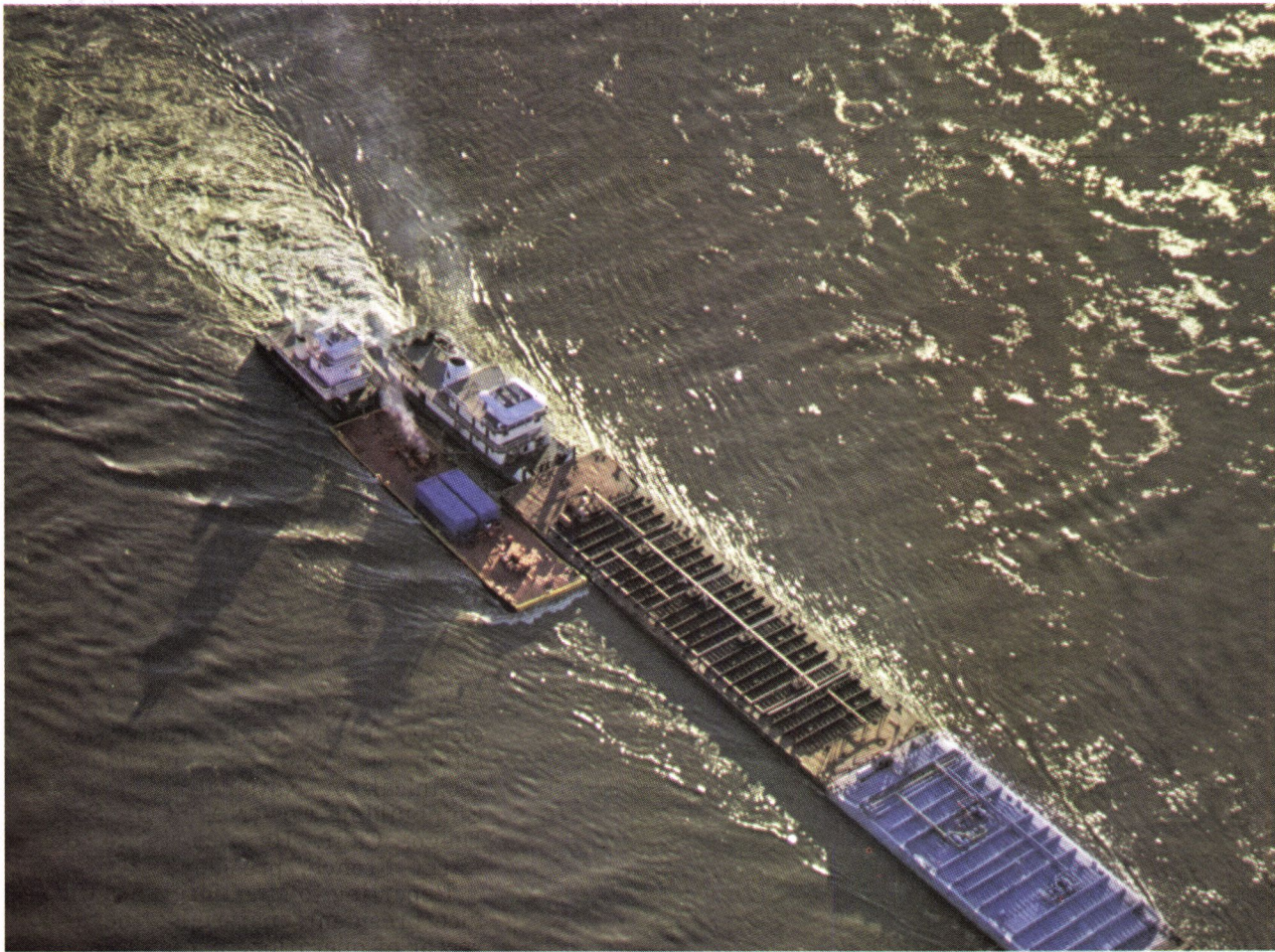
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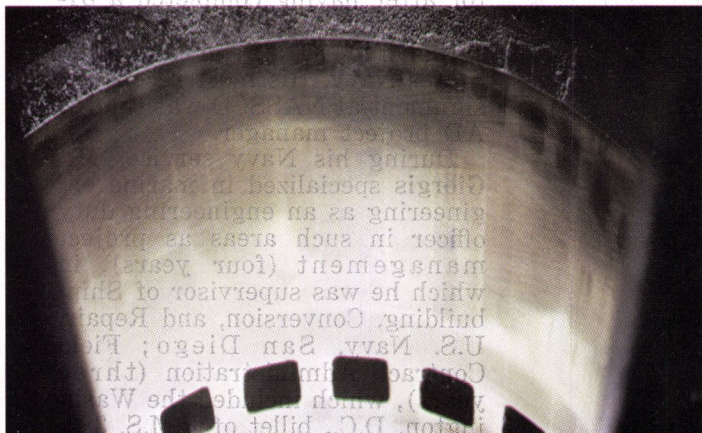
How Shell's Tornus keep thousands of work boats



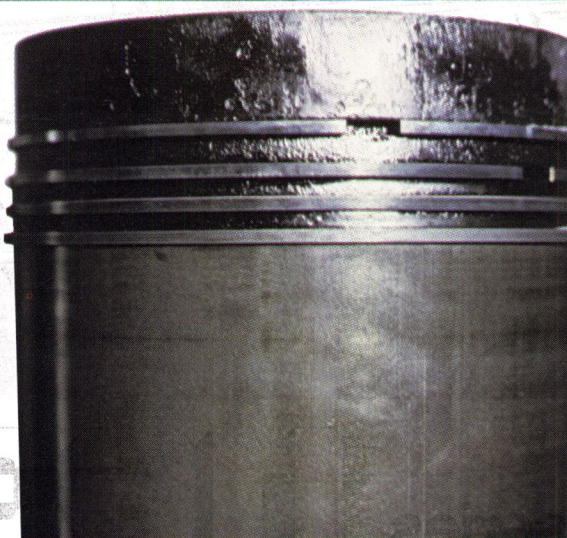
Oil has helped churning ahead for over ten years.



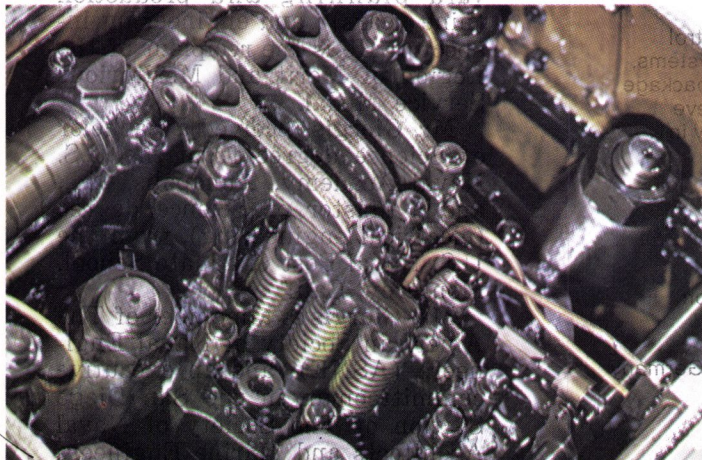
Engines in hard-working inland waterways towboats, (above), and ocean-going tugs (left) have their work cut out for them. So does the engine oil. High-dispersancy Tornus Oil protects main engines against wear, helps promote operating efficiency.



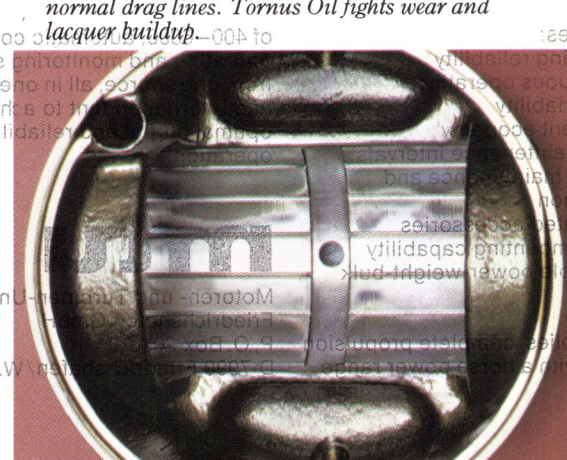
After 18,864 hours this cylinder liner from an EMD-12 645 E5 still shows original crosshatch marks. A tribute to the excellent wear protection of Shell Tornus Oil.



After over 23,000 hours, piston #1 of the starboard engine of an EMD 16-645 E7 shows light lacquer on skirt; rings in good condition, none stuck; only normal drag lines. Tornus Oil fights wear and lacquer buildup.



In this top deck of an EMD 645's port engine, note the highly polished appearance of cams and followers, the clearly visible green paint on the spring. Yet this engine has never received an oil changeout in 18,852 hours.



Much of the lead overlay is still intact on this wrist pin bushing from an EMD-12 645 E5 after 18,864 engine hours. No feathering of silver into the grooves. Tornus Oil has provided excellent lubrication.

Since 1965, Tornus Oil has been helping tugs and towboats stay on the job in oceans, harbors, the Gulf and inland waterways. There's good reason why.

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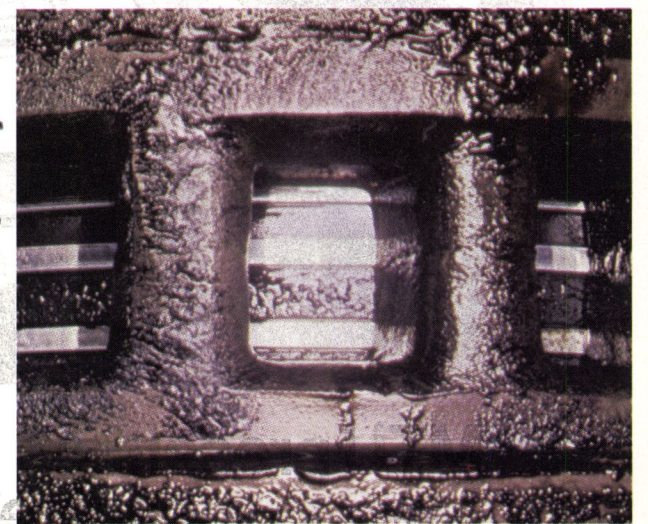
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From the same engine as the wrist pin bushing, this piston undercrown is clean, free of deposits. Tornus Oil resists sludge, lacquer and carbon deposition. This promotes cooler running pistons.

ASRY Drydock Now Open To Service 500,000-DWT Vessels

ASRY's (Arab Shipbuilding & Repair Yard) 1,230-foot by 246-foot drydock is now open for business for vessels up to 500,000 dwt.

The last stage in the construction program of this massive dock, located at Manama, Bahrain, Arabian Gulf, was successfully completed on September 16, 1977,

when the drydock was emptied for the first time by its own pumps. The dock gate, following its voyage from Portugal, had been installed a number of days earlier. If it had not fitted or worked perfectly, the opening of the yard could have been put back by weeks, but all went smoothly.

The three centrifugal pumps can empty the dock without any vessel in it in only 3½ hours. When a VLCC is being docked,

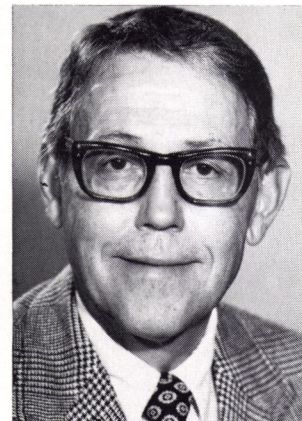
the time will be well under 2 hours.

To test the dock and its services before taking the first commercial vessel, two of ASRY's own fleet were docked on September 23, 1977. The 10,000-dwt barge, the Tartaruga, and one of ASRY's six 32-ton-bollard-pull tugs, the Arad, were docked simultaneously. The hulls of both vessels have been cleaned and painted, while the barge has also had its hull surveyed by Norske Veritas.

By the end of September, with the dock completed for the largest of vessels, ASRY was ready for its first commercial docking. The ASRY drydock has been completed and is working less than three years since the laying of the cornerstone on November 3, 1974.

For a complete description of ASRY's facilities, write to **K.M. Ratcliffe**, ASRYMAR, 17 Waterloo Place, London SW1Y 4AR, England.

NASSCO Elects Giorgis Group Vice President



Albert S. Giorgis

Albert S. Giorgis has been elected to the newly created position of group vice president, technical, of National Steel and Shipbuilding Co. (NASSCO), San Diego, Calif. He reports to **C. Larry French**, president.

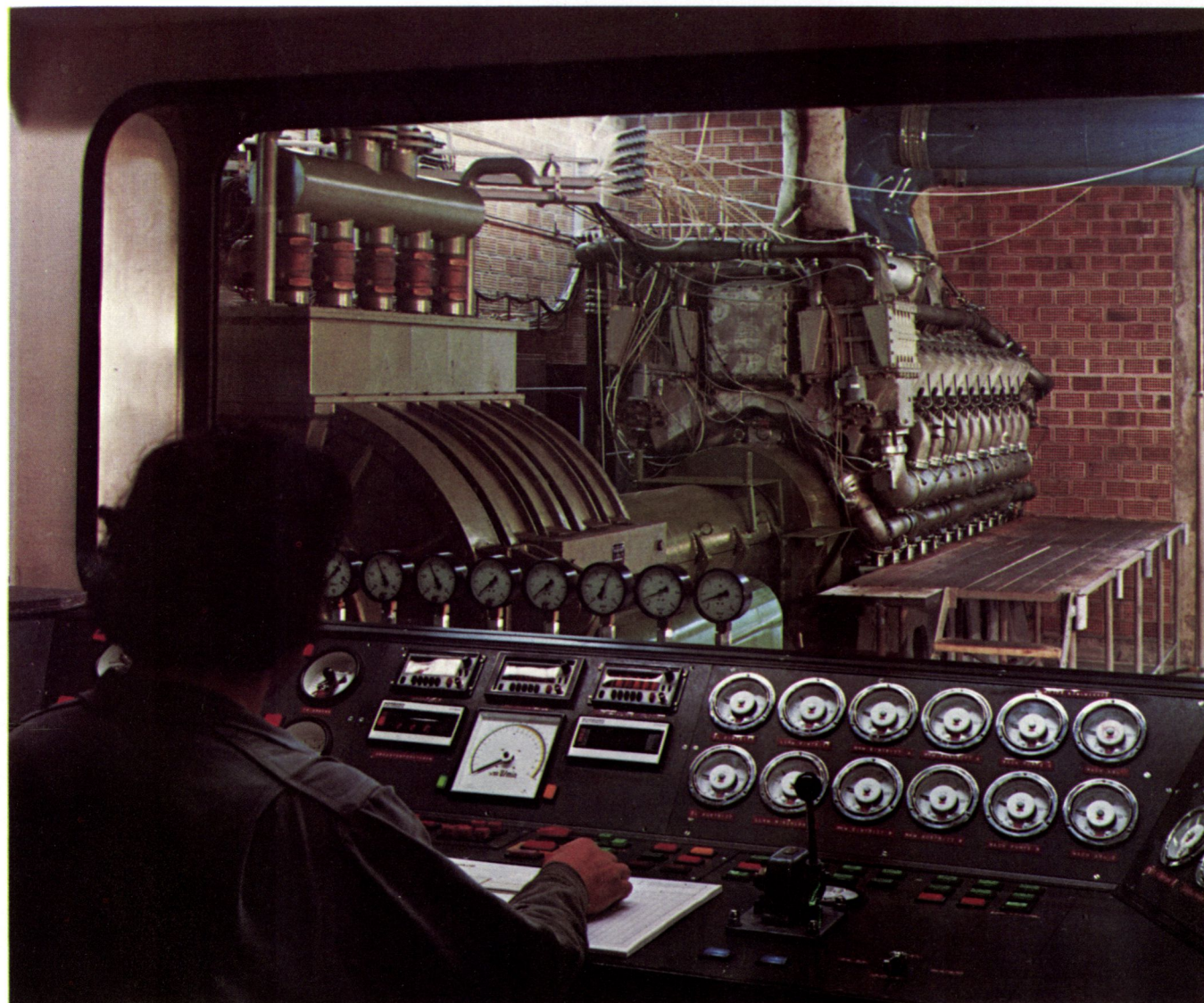
Reporting to Mr. Giorgis are the vice president, materials; the director of operations planning, and the vice president, engineering.

Mr. Giorgis joined NASSCO in June 1976 as a project coordinator after having completed a 31-year active service career (midshipman to captain) in the United States Navy. His most recent assignment at NASSCO was that of AD project manager.

During his Navy service, Mr. Giorgis specialized in marine engineering as an engineering duty officer in such areas as project management (four years), in which he was supervisor of Shipbuilding, Conversion, and Repair, U.S. Navy, San Diego; Field Contract Administration (three years), which included the Washington, D.C., billet of P.M.S. 383, program manager for major amphibious and auxiliary ships; shipyard planning and production (nine years); and engineering inspector. He is the recipient of the Legion of Merit and Meritorious Service Medal.

Mr. Giorgis received a Bachelor of Science degree from the U.S. Naval Academy, Annapolis, Md., and a Master of Science degree (electrical engineering) from the U.S. Naval Post Graduate School, Monterey, Calif.

Mr. Giorgis is a member of The American Society of Naval Engineers (ASNE), and an executive committeeman in the San Diego Section of The Society of Naval Architects and Marine Engineers (SNAME).



MTU presents: engine series 1163

With the introduction and presentation of their engine series 1163, MTU Friedrichshafen continues the successful and market-oriented development of its product line. The long stroke version 1163 derived from the well tested and proven engine series 956 opens applications in boats with a low propeller r. p. m. and in the power generator field. Range of output: 1800 KW to 4400 KW (2450 to 6000 H. P.) at 1200 r. p. m.

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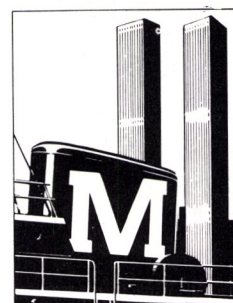
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Small Security Vessel Symposium Set For London March 6-10

"Small Fast Warships and Security Vessels" are the subject of an international symposium to be held in London from March 6 to 10, 1978. Organized by the Royal Institution of Naval Architects through its Small Craft Group, the symposium will bring

together speakers from government and industry in the U.K. and abroad, who are actively involved in designing, building, fitting-out and operating such vessels. They will present papers covering service requirements and general design considerations; hull design and propulsion; weapon systems and the selection of machinery and its influence on vessel layout.

The RINA expects interest in

the symposium to be high, following the decision by many countries to extend their Exclusive Economic Zones to 200 miles from the coast, thereby greatly increasing patrol and policing responsibilities. Apart from these peacetime activities, it is also becoming clear that the small fast warship, equipped with today's sophisticated weaponry, has an increasingly important role to play in offshore defense.

The symposium will aim to review and discuss the range of tasks likely to be demanded of vessels undertaking offshore patrol duties, whether operated by navies, coast guard or quasi-military bodies, and the various types of craft—conventional and unconventional—which may be best suited to the different roles.

It is likely that visits to shipyards where warships are under construction, and to other relevant establishments will be arranged for delegates.

Registration particulars are available from the Royal Institution of Naval Architects, 10 Upper Belgrave Street, London, SW1X 8BQ, England.

Bethlehem Steel San Francisco Shipyard Names William Hamilton



William Hamilton

The appointment of **William Hamilton** as assistant general manager at Bethlehem Steel Corporation's San Francisco, Calif., Shipyard was announced by **Gayne Y. Marriner**, general manager of the shipyard.

Prior to this promotion, Mr. **Hamilton** had been general superintendent at the yard.

A native of Belfast, Ireland, Mr. **Hamilton** holds a bachelor's degree in naval architecture from Queens University there. He also holds a degree in naval architecture from Belfast College of Technology.

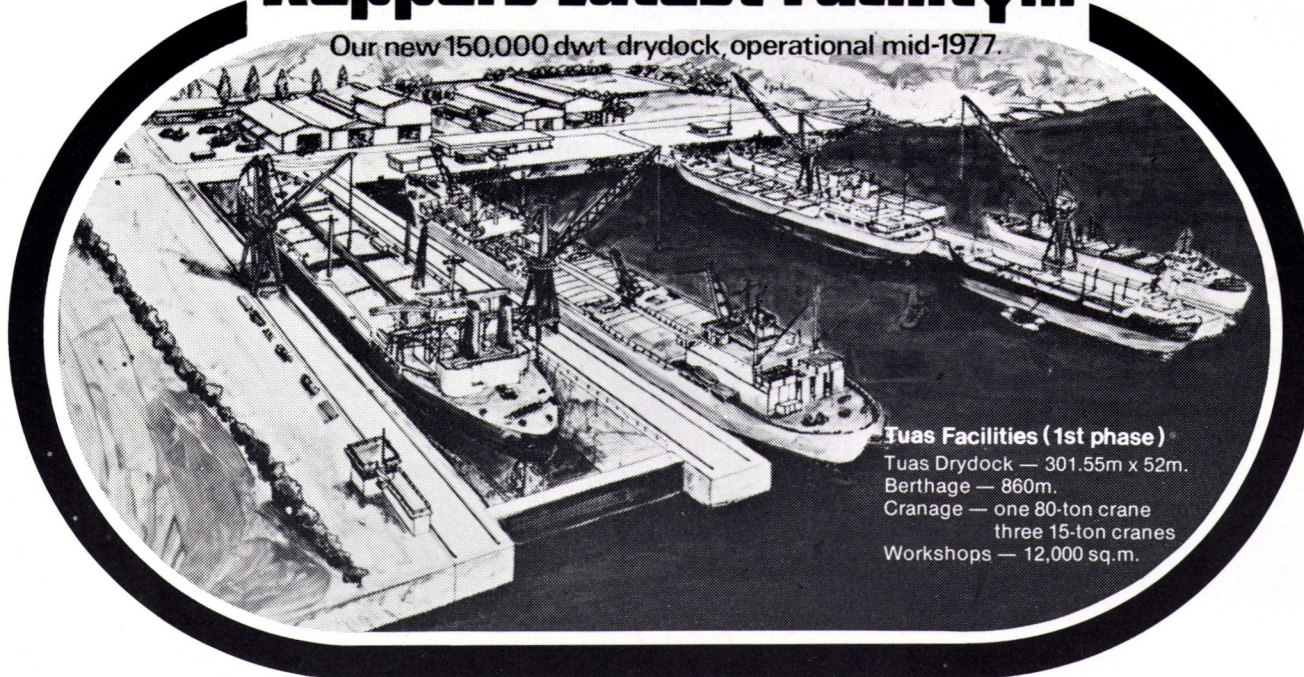
In 1949, he settled in Montreal, Canada, and for the next eight years held various management positions in ship design, new construction and conversion work for Canadian Vickers, Ltd.

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Mr. **Hamilton** is a member of The Society of Naval Architects and Marine Engineers, Northern California Section; The Propeller Club; Marine Engineers of San

Keppel's Latest Facility...

Our new 150,000 dwt drydock, operational mid-1977.



Tuas Facilities (1st phase)

Tuas Drydock — 301.55m x 52m.
Berthage — 860m.
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Workshops — 12,000 sq.m.

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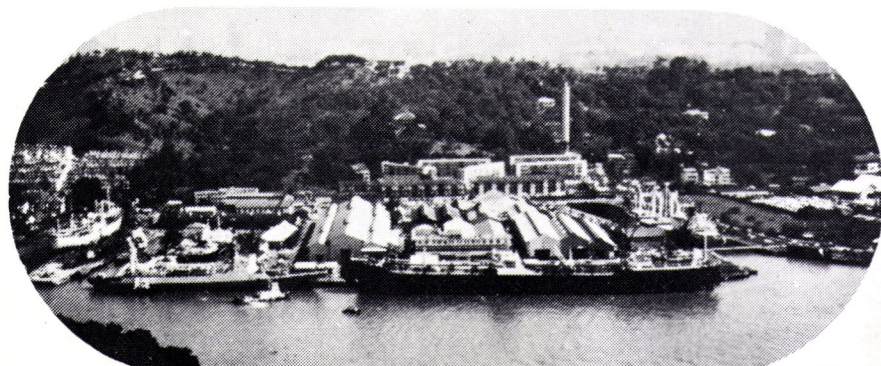
For more than a century Keppel has been repairing ships of all shapes, sizes, complexities and sophistication. Today we repair some 2,500 vessels a year, ranging from tankers, general-cargo ships, bulk carriers and passenger liners to drillships, livestock carriers and fish-and-whale floating factories. Our six drydocks of 40,000 DWT capacity are fully supported by comprehensive workshop facilities. We handle conversions, emergency repairs, annual and special surveys, operating round-the-clock seven days a week.

Our new 150,000 DWT Drydock at the Tuas Shipyard will become operational in mid-1977, and is now

able to accommodate alongside repairs of vessels of up to 250,000 DWT.

To provide an all-round complete shiprepair/shipbuilding service, Keppel has diversified and is today, the parent company of a group of companies involved in rig and shipbuilding; anchorage and voyage repairs; steelwork repairs and structural contract work; grit-blasting and tank coating.

With experience and expertise, we have thus acquired the technology to provide service, quality and on-time deliveries at competitive prices. To these ends we are committed, as we have been for the last century.



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systems delivered in Sperry's expanding steering system business

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Whether she's behind the biggest barge, or towing the long-distance haul, "Heide Moran" has enough power, size and technology to handle your toughest jobs. This new breed of Moran tug is 126 feet long, powered by 4,730hp turbo-charged engines,

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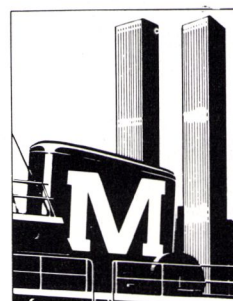
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Small Security Vessel Symposium Set For London March 6-10

"Small Fast Warships and Security Vessels" are the subject of an international symposium to be held in London from March 6 to 10, 1978. Organized by the Royal Institution of Naval Architects through its Small Craft Group, the symposium will bring

together speakers from government and industry in the U.K. and abroad, who are actively involved in designing, building, fitting-out and operating such vessels. They will present papers covering service requirements and general design considerations; hull design and propulsion; weapon systems and the selection of machinery and its influence on vessel layout.

The RINA expects interest in

the symposium to be high, following the decision by many countries to extend their Exclusive Economic Zones to 200 miles from the coast, thereby greatly increasing patrol and policing responsibilities. Apart from these peacetime activities, it is also becoming clear that the small fast warship, equipped with today's sophisticated weaponry, has an increasingly important role to play in offshore defense.

The symposium will aim to review and discuss the range of tasks likely to be demanded of vessels undertaking offshore patrol duties, whether operated by navies, coast guard or quasi-military bodies, and the various types of craft—conventional and unconventional—which may be best suited to the different roles.

It is likely that visits to shipyards where warships are under construction, and to other relevant establishments will be arranged for delegates.

Registration particulars are available from the Royal Institution of Naval Architects, 10 Upper Belgrave Street, London, SW1X 8BQ, England.

**Bethlehem Steel
San Francisco Shipyard
Names William Hamilton**



William Hamilton

The appointment of **William Hamilton** as assistant general manager at Bethlehem Steel Corporation's San Francisco, Calif., Shipyard was announced by **Gayne Y. Marriner**, general manager of the shipyard.

Prior to this promotion, Mr. **Hamilton** had been general superintendent at the yard.

A native of Belfast, Ireland, Mr. **Hamilton** holds a bachelor's degree in naval architecture from Queens University there. He also holds a degree in naval architecture from Belfast College of Technology.

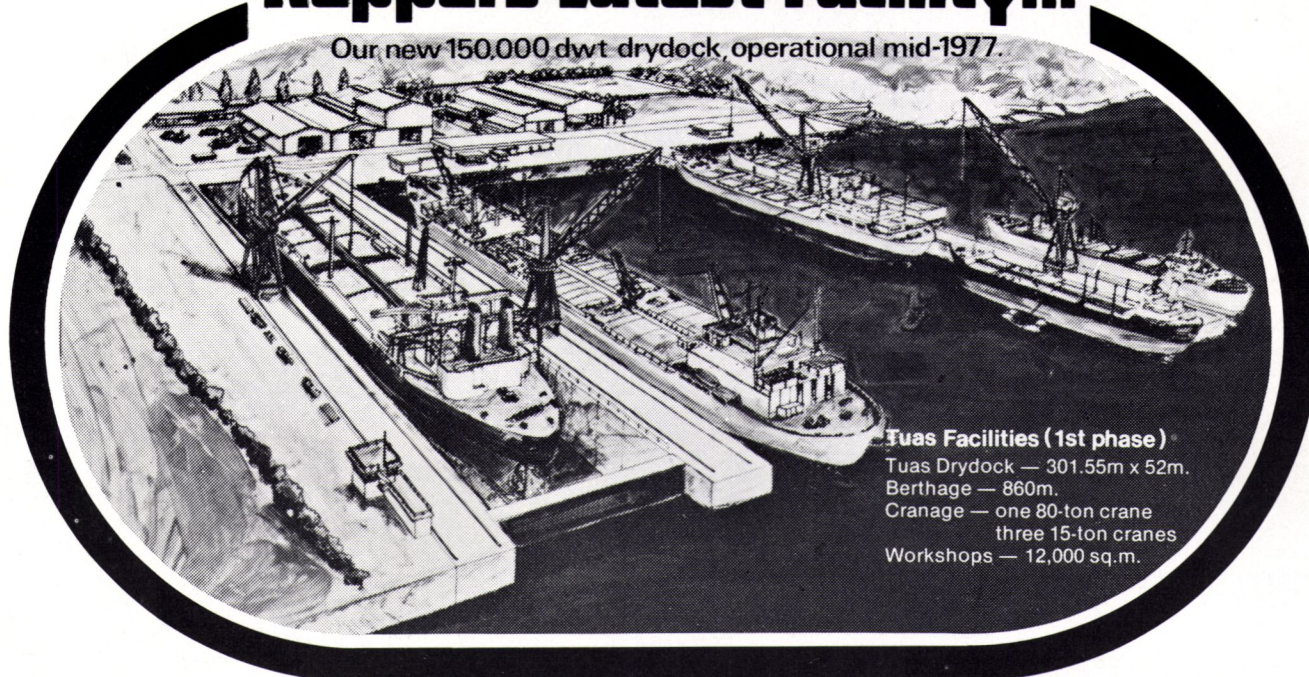
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Mr. **Hamilton** is a member of The Society of Naval Architects and Marine Engineers, Northern California Section; The Propeller Club; Marine Exchange of San Francisco, and the World Trade Club.

Keppel's Latest Facility...

Our new 150,000 dwt drydock, operational mid-1977.



Tuas Facilities (1st phase)
Tuas Drydock — 301.55m x 52m.
Berthage — 860m.
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Workshops — 12,000 sq.m.

Over a century of dedication to quality.

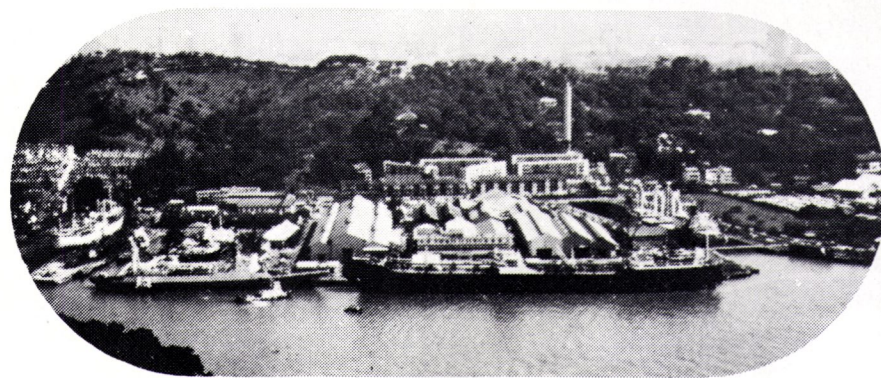
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With experience and expertise, we have thus acquired the technology to provide service, quality and on-time deliveries at competitive prices. To these ends we are committed, as we have been for the last century.



Keppel Shipyard... present drydock capacity of up to 40,000 dwt.

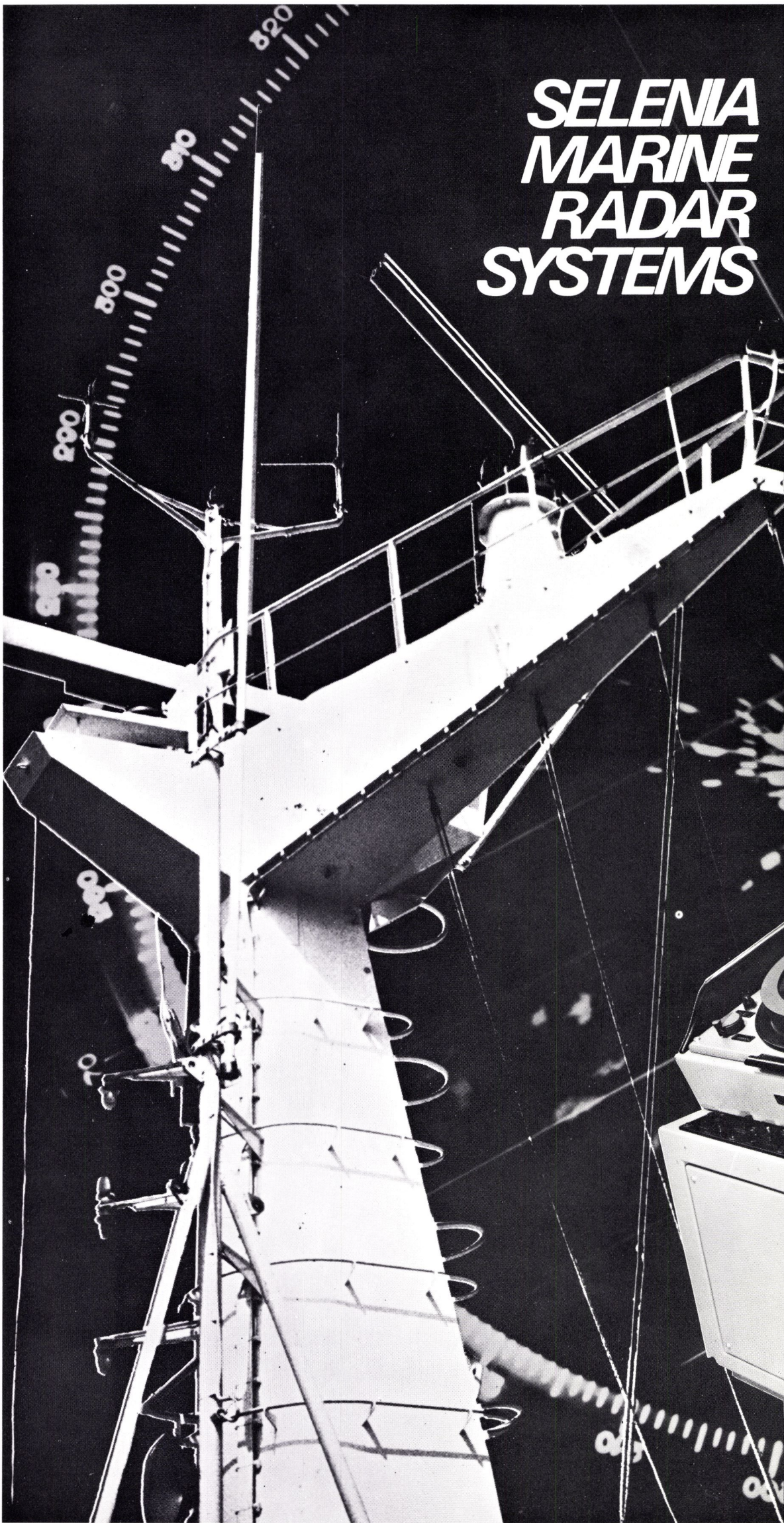
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They are installed on all types of vessels, from small ships to VLCC's, while a number of navies have adopted them.

Selenia marine radars range from a small 12 inch, 20 kw radar to a complete computer driven anticollision system.

Marine radars, as all other Selenia products, are backed by a worldwide sales and service organization.

For additional information, please contact:

ITT Mackay Marine

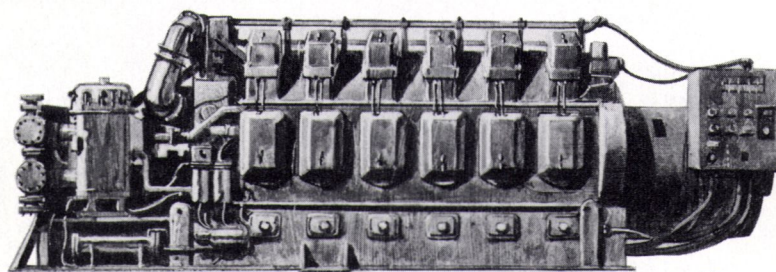
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Telephone (919) 828-4441

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This is the 1200 RPM engine that reduces capital investment and interest payments

It packs more horsepower in less space.
In many applications it lets you substitute a smaller engine for
a larger 900 RPM engine...an in-line 6 for a V-8
...a V-12 for a V-16...a V-16 for a V-18.



It lets you spend less
money per horsepower or
kilowatt. And pay less
for bank interest, too.

It can go as long as 25,000 hours
between major overhauls with only routine maintenance.

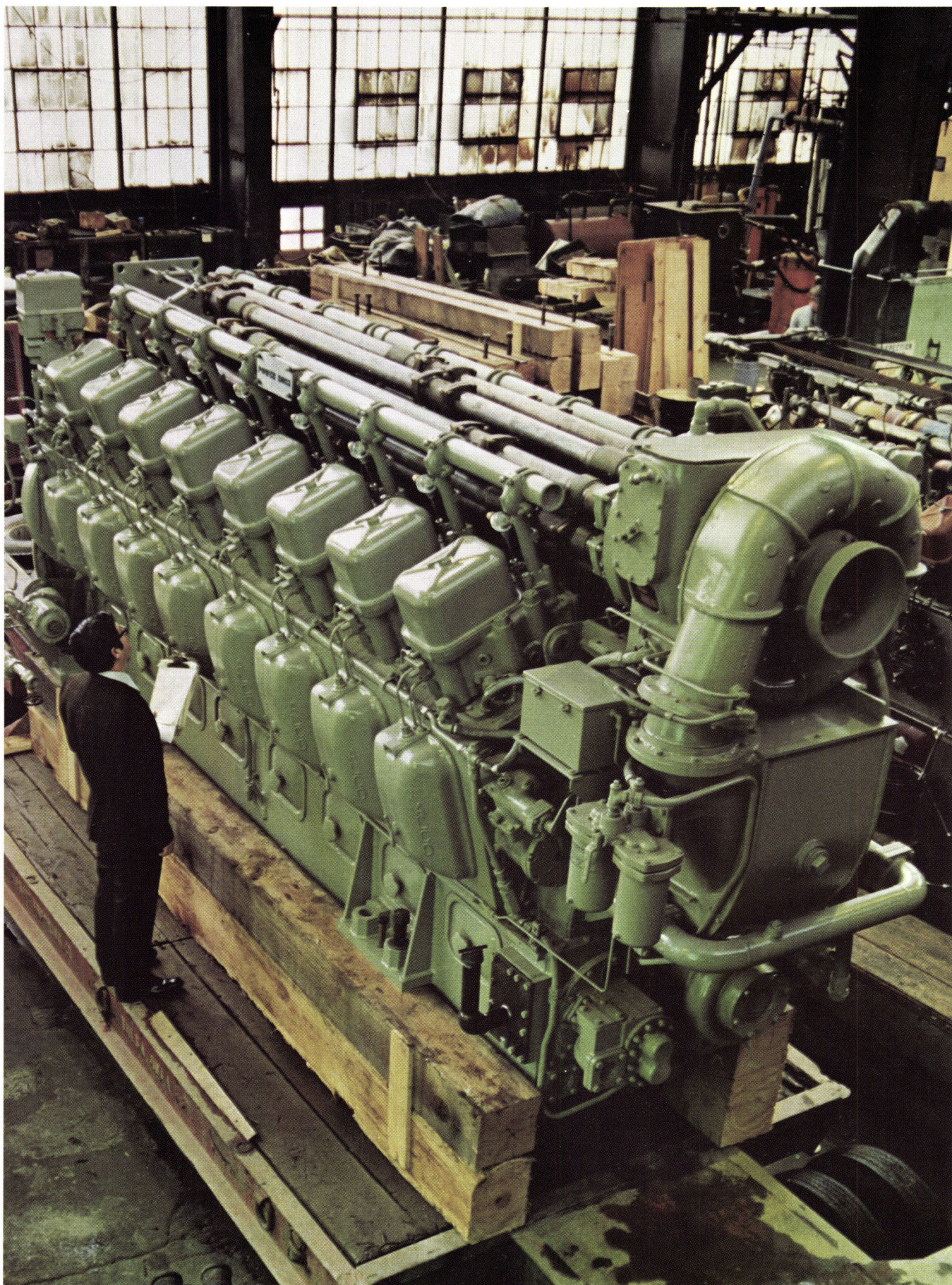
In marine applications it takes less space so there's more
room for fuel and you get longer cruising ranges.

In many stationary power uses, it requires a smaller, less
expensive generator for the same output.

For details write Alco Power Inc.,
Auburn, N. Y. 13021 or phone: 315/253-3241.



A world of power



Lighter. Smaller. More Powerful. Alco Power Boss/1200 diesels are available as in-line 6, V-12 and V-16 cylinder units. The high RPM lets you fit more power in less space at lower cost and still get all of Alco's traditional dependability and serviceability.

Sperry's First Triple Flow Steering Systems Installed At NASSCO

Sperry Marine Systems has delivered four 24,000,000-inch/pound steering systems to National Steel & Shipbuilding Co. (NASSCO) for the 188,500-dwt San Diego-Class tankers. These systems are the first triple flow

systems delivered in Sperry's expanding steering system business.

The triple flow system, which is based upon Sperry's proven dual flow design, utilizes three stages of oil flow to provide smooth rudder motion. Three rudder servo amplifiers control two directional valves or a dump valve to provide three rudder rates. The valves are operated as a function of the difference between ordered rudder

and actual rudder angle which is rudder error.

For rudder errors less than 3 degrees, an oil flow of 90 gpm is provided, giving a rudder rate of approximately 1.2 degrees per second; for rudder errors between 3 and 5 degrees, an oil flow of 147 gpm is provided for a rudder rate of approximately 1.9 degrees per second, and for rudder errors in excess of 5 de-

grees, 222 gpm is provided for a rudder rate of approximately 2.9 degrees per second.

Sperry Marine Systems is providing a Total Steering System for NASSCO's San Diego-Class tankers, consisting of Sperry's MK-37 Gyrocompass, Dual Gyro-pilot System, Rudder Angle Indicating System, Course Recorder, Rate of Turn Indicator and the Triple Flow Clevis Mounted Steering Gear.

Sperry Marine Systems, a manufacturer of steering systems for over 50 years, can provide Total Steering Systems from 10,000 ft./lbs. rudder torque. For further information, contact **Henry H. Johnston**, Assistant Marketing Manager, Sperry Marine Systems, Worldwide Headquarters, Great Neck, N.Y. 11020.

Vernon Morrison Joins SCNO Barge Lines, Inc.



Vernon K. Morrison

Vernon K. Morrison has joined SCNO Barge Lines, Inc. in the capacity of vice president-sales, it was announced by **Frank R. Markland**, president.

Mr. Morrison, a graduate of Duquesne University, has been engaged in river transportation for the past 35 years.

"Mr. Morrison's knowledge and experience will be a strengthening asset to our management team," Mr. Markland said.

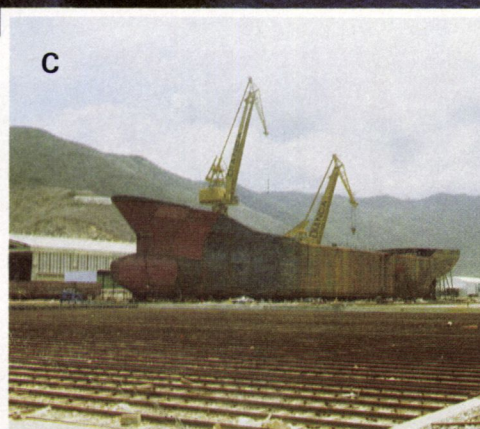
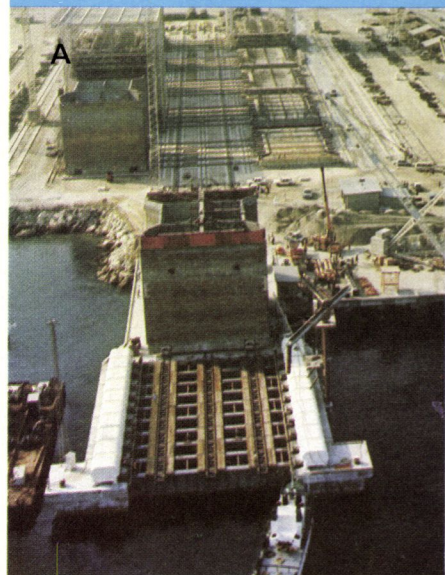
Mr. Morrison will be based in St. Louis at SCNO's general office, 10000 Old Olive Road, St. Louis, Mo. 63141.

F & S Offshore Requests Title XI To Finance Four 3,000-HP Vessels

F & S Offshore, Inc., 3501 North Causeway Boulevard, Suite 600, Metairie, La. 70002, has applied for a Title XI guarantee to aid in financing the construction of four 3,000-hp oceangoing towing/supply vessels, approximately 180 feet by 40 feet by 14 feet each.

These vessels, to be constructed by J. Ray McDermott & Co., Inc., Harvey, La., for an approximate cost of \$1,900,000 each, will be used primarily for the carriage of cargo and equipment and towage of barges in connection with offshore oil and gas exploration and construction.

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Unequalled record of performance . . .

- Pearlson Engineering is the **ONLY** company in the world devoted exclusively to the design and supply of shiplift systems.
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- More than 150,000 vessels have been docked and transferred by Syncrolifts throughout the world.
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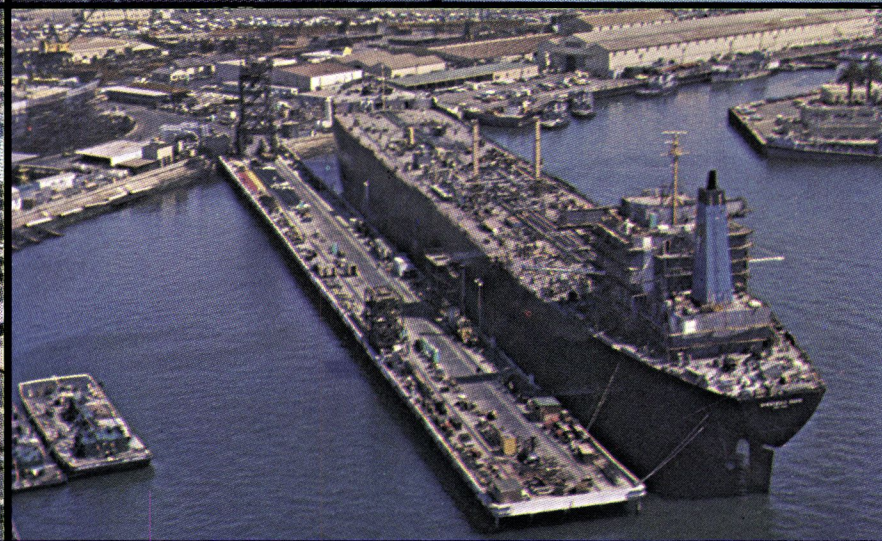
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A. DUBAI, UAE: Concrete caissons weighing 4,000 tons launched on Syncrolift.® Assembly line construction in transfer area.

B. LAS PALMAS, CANARY ISLANDS: 27,400 DWT vessel, Cobetas, 183 m. long being transferred to parking area from Syncrolift.®

C. PUERTO CABELLO, VENEZUELA: 30,500 DWT vessel constructed in two sections on land. Each is launched separately on Syncrolift.® and the two sections are welded together in the water.

take a closer look...



...recent additions to our yard capabilities, more production power working for you.

210' span, 15 ton, magnetic, plate storage crane
1000' x 176' building basin
panel line for assembly of panels up to 40' x 65'

numerical control mold loft development system
new 1090' finger pier
tape controlled plasma arc burning machine



NATIONAL STEEL AND SHIPBUILDING COMPANY

Owned by Kaiser Industries Corporation and Morrison-Knudsen Company, Inc. San Diego, Ca 92138 Phone (714) 232-4011

Drury To Represent A.C. Hoyle Company In Northwest Area

A.C. Hoyle Company, Iron Mountain, Mich., manufacturers of marine deck equipment, has announced the appointment of William Drury Company, Inc., 2220 East 11th Street, Tacoma, Wash. 98421, as their exclusive sales agent for Washington, Oregon, Alaska and Hawaii.

The William Drury Company has been actively serving marine accounts in the Northwest area for many years, with a wide selection of marine-related equipment and services. Office sales personnel are William Drury Sr., William Drury Jr., and Larry Roulstone.

Carrier Transicold Names William Bingham

Carrier Transicold Company, Syracuse, N.Y., has appointed William A. Bingham Jr. manager of military, marine and nuclear products.

Mr. Bingham joined Carrier Corporation, of which Carrier Transicold is a division, as a control engineer in 1947. He held several successive engineering and teaching positions, and in 1965 was made program manager for Carrier Transicold's work with Minuteman environmental control systems at Kennedy Space Center.

In 1972, Mr. Bingham became Carrier Transicold's sales manager for military and marine products, a position he held until his recent appointment.

Twenty-Four Women Report For Sea Duty To U.S. Coast Guard

Twenty-four women have reported to the United States Coast Guard cutters Gallatin and Morgenthau to begin historic sea duty.

The first women ever assigned to serve aboard armed U.S. military vessels, they will be taking part in fisheries patrols in Atlantic and Pacific waters this fall.

Two officers and 10 enlisted women have been assigned to each of the 378-foot high-endurance cutters, the Gallatin berthed at Governors Island, N.Y., and the Morgenthau at San Francisco, Calif.

As the ships got ready for departure, Secretary of Transportation Brock Adams sent "bon voyage" telegrams to the cutters' crews through their commanding officers — Gallatin Capt. Alan D. Breed of Tampa, Fla., and Morgenthau Capt. George E. Walton of Parsippany, N.J.

"I want to congratulate you on having the opportunity to be the first to carry out this new responsibility. Men and women, together, will be participating for

the first time in the historic mission of the Coast Guard at sea. I send you the best wishes of the Department of Transportation and the Administration as you set sail. The inclusion of women among Coast Guard ship crews is another major step in this country's efforts to utilize the talents and resources of all of its people."

Both vessels carry crews of about 15 officers and 140 enlisted personnel.

Marlin Machinery Named To Represent Davey Compressor

The Marlin Machinery Corporation, 39 Broadway, New York, N.Y. 10006, has been named master distributor for the marine field by the Davey Compressor Company of Cincinnati, Ohio.

Stephen B. Dichter, president

of Marlin Machinery and a graduate of Dartmouth College and the Columbia University School of Business, announced that Davey has developed a new Permavane® Rotary Model BWQM, which was tested at sea by the Maritime Overseas Corporation. This compressor, which was used for general maintenance purposes, performed flawlessly, and a total of nine units have now been ordered by Maritime Overseas.

A breakthrough in video processing

With ordinary radar there are six fundamental problems that can hinder the interpretation of a radar picture — **Sea clutter**, which can best be dealt with by manual adjustment of the sea clutter controls; **Rain clutter**, dealt with by manual adjustment of 'rain' and 'sea clutter' and 'gain' controls. (These controls require constant skilled adjustment, sometimes over long periods, and provide at best a compromise solution.) **Radar interference** from other ships and **receiver noise** from own ship also worsen the picture. **Weak echoes** are hard to pick out and **small echoes** even harder to see at long range.

But now Decca CLEARSCAN radar solves these problems with unrivalled picture clarity.

Sea clutter is suppressed by automatic adaptive control of the Sea Clutter Control.

The rain clutter is suppressed by automatic adaptive control of both the rain and sea clutter controls, and gain level.

Radar interference is suppressed by automatic circuits.

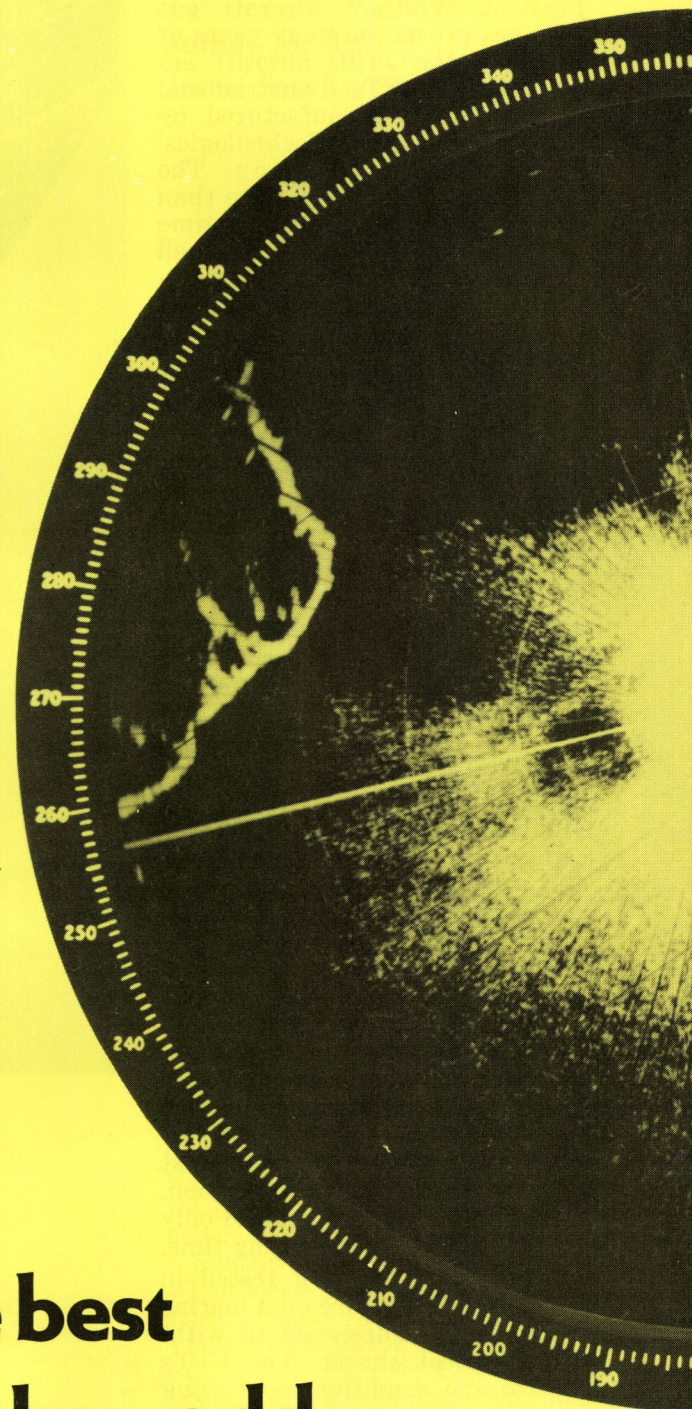
Receiver noise automatically removed.

Weak echoes automatically raised to full brilliance by digital video...

...and echoes 'stretched' automatically on longer ranges.

For the radar efficient ship.

...improving the best marine radar in the world.



GE Credit Buys Third 225,000-DWT Tanker From Seatrain Shipbuilding

The General Electric Credit Corporation announced it has purchased for \$120,000,000 the 225,000-dwt tanker T.T. Stuyvesant, and that the vessel has been initially chartered to the Standard Oil Company of Ohio (SOHIO) to transport Alaskan oil.

The VLCC (very large crude carrier) was built by Seatrain Shipbuilding, a subsidiary of Seatrain Lines, at the former Brooklyn Navy Yard, and is a sistership to the Brooklyn and Williamsburgh, which also are owned by GE Credit.

The Stuyvesant, like its sister vessels, is capable of delivering 1,600,000 barrels of oil.

GE Credit has arranged a 20-

year leveraged lease of the vessel to the newly formed shipping corporation, Queensway Tankers, Inc., which in turn has arranged a three-year time charter to SOHIO to transport North Slope oil from Valdez, Alaska, to Panama. Because the Stuyvesant is too large to negotiate the Panama Canal, it will offload its cargo at Balboa for delivery in smaller tankers to Gulf Coast refineries.

In acquiring the Stuyvesant, GE Credit made an equity investment of \$33,000,000. The senior debt consists of a \$29,000,000 U.S. Government Title XI loan, made during construction of the vessel, an additional \$31,000,000 Title XI loan arranged by Kuhn, Loeb, Inc. and Shearson Hayden Stone, Inc., and a \$27,000,000 third mortgage note.

A spokesman for GE Credit said the purchase-lease-charter deal was unusual in that it was put together in just two months.

GE Credit, headquartered in Stamford, Conn., is a wholly owned subsidiary of General Electric Company and the world leader in leveraged leasing of industrial and transportation equipment, with more than \$3 billion in such equipment on its books.

GE Credit acquired its first VLCC, the Brooklyn, in December 1973. At that time, it was the largest commercial vessel built in the United States. The Williamsburgh was purchased one year later.

The Brooklyn and the Williamsburgh are under 25-year time charters to American Petrofina, Inc., a subsidiary of Petrofina S.A. of Belgium.

In addition to the three Seatrain-built tankers, GE Credit also owns four other tankers and currently is arranging the leveraged lease financing of eight additional vessels.

When the 15 tankers in the GE Credit "fleet" are all in service at the end of 1978, they will have added 2,593,000-dwt to U.S.-flag tanker tonnage.

Port Of New Orleans Orders Second Paceco MACH Portainer

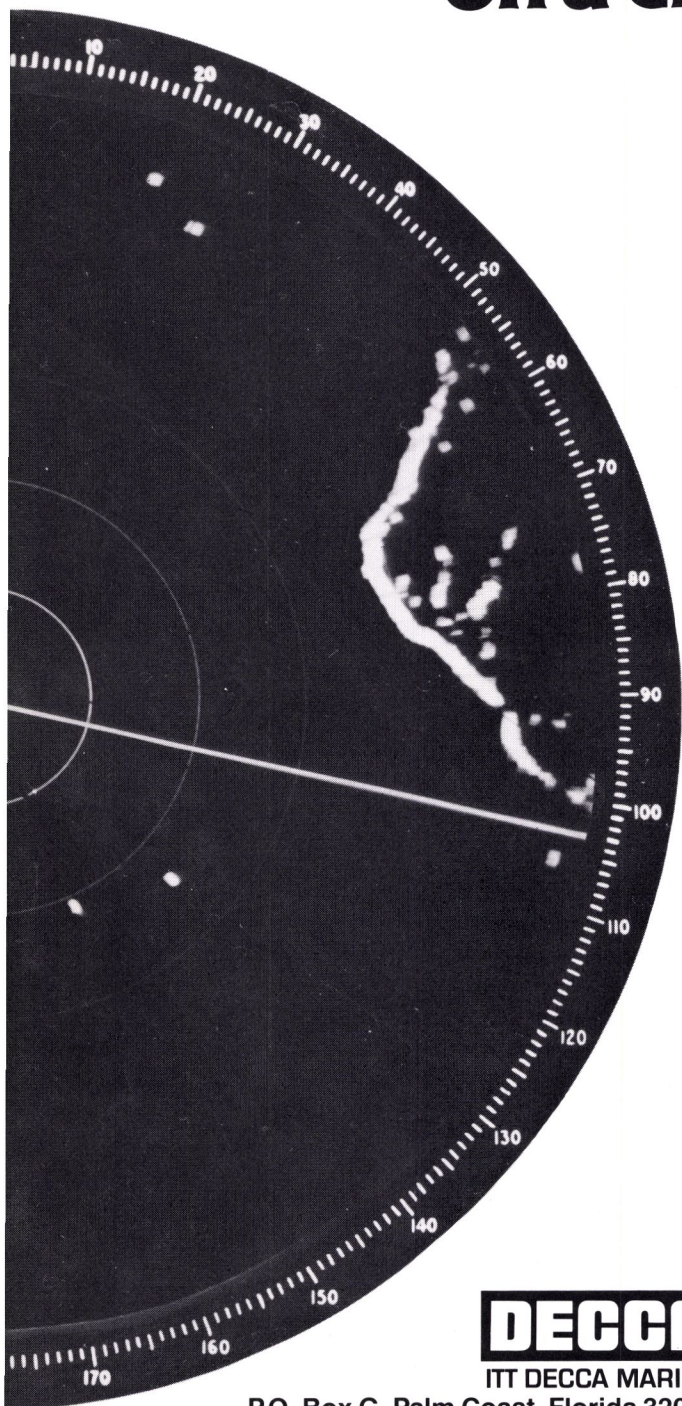
Container Lift International, Inc. has ordered a second MACH (modular automated container handling) Portainer® for the Port of New Orleans from Paceco, Inc., a subsidiary of Fruehauf Corporation, Alameda, Calif.

The new Portainer, equipped with latest engineering improvements, will be almost a "twin" in structure to the first Paceco 40-long-ton MACH Portainer in operation at the New Orleans port since 1974. This second crane, equipped with a telescopic spreader, is capable of handling 20-foot, 35-foot, and 40-foot containers. It will be installed alongside the first Portainer at Berth 5 of the port's France Road Container Terminal.

CLI, a private enterprise, is responsible for the purchase and maintenance of the Paceco-built Portainers and will make them available to ship lines using Berths 4 and 5 at the terminal.

Paceco's Gulfport, Miss., facility will fabricate the new structure. The giant Portainer is scheduled to be erected at the port in the fall of 1978.

-now gives brighter, clearer echoes on a clutter-free screen.



- Suppresses sea and rain clutter
- Suppresses noise and interference
- Makes echoes brighter -with more contrast
- Makes echoes longer

All these improvements can now be had with the unrivalled DECCA Solid State 9, 12 and 16 in relative and true motion displays and the famous AC display system, on both 3 and 10cm wavelengths.

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**DECCA
CLEARSCAN
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New York Port Engineers Hears Paper On Surface Preparation Of Steel



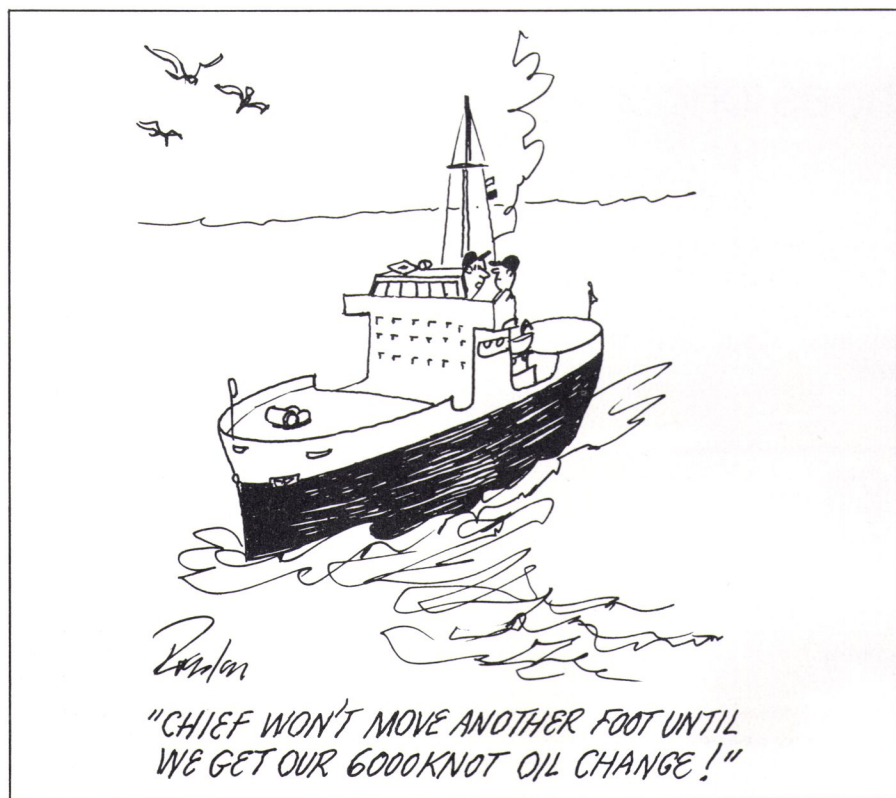
Pictured at the meeting, left to right: (seated) **Thomas Young**, United States Lines, coordinator; **H.W. Hitzrot**, Bethlehem Steel Corporation, Research Department, speaker; **Thomas Jones**, American Export Lines, Society president; (standing) **Harlan T. Haller**, Bailey Refrigeration, chairman of the board of directors; **John Antonetz**, Texaco Inc., Papers Committee; **Edward English**, Atlantic Repair Co., Inc., secretary-treasurer, and **Louis V. Minett**, American Bureau of Shipping, vice president.

The Society of Marine Port Engineers New York, N.Y., Inc. met on September 21 at the Downtown Athletic Club in New York City.

At the technical session, which was preceded by a social hour and dinner, a paper was presented on "Surface Preparation of Steel for Painting and Other Coating Applications," by **H.W. Hitzrot**, Research Department, Bethlehem Steel Corporation, Shipbuilding Division. The sponsor was **Thomas J. Young** of the United States Lines.

In his paper, Mr. **Hitzrot** summarizes the findings of a number of Bethlehem Steel Corporation research projects on the surface

preparation of steel by abrasive blast cleaning in the construction, shipbuilding and ship repair industries. The report is divided into sections on (1) Steel Abrasives, and (2) Mineral Abrasives. Steel abrasives are of two major types: shot and grit. They are used in automatic wheel blasting units or in manual blast cabinets. Mineral abrasives include slags, sands and oxides, which are generally angular in shape and are used for manual blast cleaning. The types of abrasive recommended for various blast cleaning operations are summarized in the paper, and detailed information on specific applications is provided.



Halter Marine Develops

SCR Propulsion System For Offshore Tug/Supply Vessels

A new type of marine propulsion system for offshore tug/supply vessels was recently announced by Halter Marine Services, Inc., of New Orleans, La. This new propulsion system involves the use of silicon-controlled rectifiers (SCR) for control of electric propulsion or diesel-electric propulsion.

The first two tug/supply vessels utilizing the SCR system for propulsion will soon be under construction for Acadian Marine Service, Inc., New Orleans, La., at Halter Marine Services.

The announcement of this new concept in marine propulsion was made at a press conference in New Orleans by **Harold P. Halter**, president, Halter Marine Services, and **Prieur Leary**, president, Acadian Marine Service.

Acadian Marine is an owner/operator of offshore support vessels for the oil and gas industry, and the new class of vessels was designed by Halter to Acadian's operational requirements. This new design is the subject of a patent application filed by Halter.

The conventional tug/supply vessel is considered a fine machine in its own right, but an optimization was required to permit extended use, extended versatility, extended efficiency and savings for the offshore charterer.

Diesel-electric propulsion is not new to the marine industry, but the SCR diesel propulsion system represents a major change in the design and operational capabilities of the specialized offshore tug/supply vessel since its introduction to the oil and gas industry in the late 1940s and early 1950s.

There has been a slow evolution of the typical offshore service vessel since its inception in the beginning days of the offshore industry—the placement of the deckhouse forward, the installation of more powerful engines, the fitting of anchor-handling winches and equipment, stern rollers, bow thrusters for maneuverability, improved electronics for navigation and communications, and the placing of mud tanks below deck.

Basically, the utilization of the SCR propulsion system reduces total ship diesel horsepower required by the efficient use of the installed horsepower, thereby reducing the use of fuel and extending engine life. Primary diesel

engines are moved to any area of the hull, with stack location dictated by economics, increasing operational payload of the vessel. Towing advantages are increased greatly because all available horsepower is used, high reliability is obtained in the power system, and the system permits flexibility in design and construction, in usable horsepower and in operational applications.

Mariner-Class Specifications

Length overall	216 ft. 6 in.
Load waterline length	200 ft. 0 in.
Breadth, mld.	44 ft. 0 in.
Depth, mld.	16 ft. 0 in.
Displacement, light	1,035 LT
Operating draft	13 ft. 6 in.
Displacement, normal	2,451 LT
Electric motors — four GE-581, 600-volt d-c, 1,800 hp @ 1,000 rpm.	
Engines — five Detroit Diesel 16V149T1's driving five 900-kw, 3-phase, 60-cycle, 600-volt a-c generators.	
Loaded speed	13 knots
Range	9,000 miles
Classification—	American Bureau of Shipping

Mr. **Halter** stated during the press conference that: "We have been constantly involved in designing and building more efficient offshore oil and gas industry support vessels. Uppermost in our minds has been the need to reduce the fuel consumed by the typical tug/supply vessel, the need to save as much energy as possible and at the same time to maintain or increase the power and towing and other operational capabilities of the vessel. There has also been the need to create a new class of tug/supply vessels within certain size ranges that could operate effectively in a variety of offshore oil fields, a vessel flexible enough to work, for example, in the North Sea under one set of conditions and in the Gulf of Mexico under entirely different conditions. We feel that this new design is so innovative that we have applied for the appropriate patents.

"The development of the SCR propulsion system for tug/supply vessels has, we feel, accomplished these objectives. But the flexibility of the vessel using this type of power does not end with its fulfilling the basic operational requirements of getting somewhere efficiently and more profitably for its owner. A great number of the vessel's services systems can be tied directly into the SCR system without decreasing the propulsion-power output. The SCR equipment can power the ship's pumps, cranes, fire-protection system, an-

chor-handling and bowthruster equipment, and, when necessary, provide complete electrical service directly to an offshore installation for positive and reliable continued operation of that installation's functions offshore. We have made it possible, through the use of SCR, for engine life to be extended because of the very nature of the system in selecting and using precise amounts of horsepower required for the job to be performed.

"All of this, of course, results in greater efficiency in the operations of companies operating offshore and a savings in energy, time and money."

Capt. Rudy Vorenkamp, executive vice president of Acadian Marine, added the following to Mr. Halter's comments: "We feel that the new Mariner Class of offshore tug/supply vessels now being built represents a major development in our operations offshore. The use of SCR, as has been noted, will greatly extend the usefulness of the typical vessel, and this was one of the prime objectives of this company in considering the use of the SCR system.

"We wanted to build and operate a more versatile and more flexible vessel, that could fulfill its operational objectives as a highly efficient tug/supply vessel, but when required, be placed into service, for example, as a small containership for feeder container service in a great many places in the world. We were immensely intrigued by the SCR concept as something new and different and highly practical in the industry, and a system that has proved to be workable elsewhere in the general maritime industry.

"Most important of all, it is a system that would give us high diversity and flexibility in our marine operations. The overriding consideration to that end was the flexible horsepower available. Our operational capabilities will be expanded tremendously.

"Among the uses for this new class, we can operate as a tug/supply vessel, an offshore-platform power-supply source without effecting our own power needs, and as a feeder containership. And, we feel that this is just the beginning."

S.J. Guarino, vice president of engineering, Halter Marine Services, explained the engineering advantages of the SCR system as follows: "From an engineering and design standpoint, we now have much greater freedom of choice in the placement of major equipment in this type of vessel. We never had this before, being restricted in the design of the conventional diesel vessel, for example, by long propeller shafts or long exhaust runs. The carrying capability of the new vessel is enhanced and expanded because we can now place generating units just about anywhere we wish.

"From a technical and operational viewpoint, the SCR can provide maximum power to the propellers, or maximum power to the ship's auxiliary functions, as required. The SCR is capable of producing and applying the exact amount of horsepower required whenever or wherever it is needed — instantly and without decreasing the horsepower or power supply to other ship's systems and needs."

Harry O'Brien, marine electrical consultant, worked with Halter Marine Services to develop the SCR system for its application in these offshore tug/supply vessels.

A brief description of the system detailed in a technical paper presented by Mr. O'Brien at a Society of Naval Architects and Marine Engineers symposium stated:

"Diesel-electric propulsion was one of the first modes of propulsion after steam power, and many old Navy tugs utilize a d-c/d-c propulsion system. However, since most modern tugs are of twin-screw propulsion configuration for maneuverability, electric propulsion lost favor. A twin-screw tug using the old diesel-electric propulsion system is equipped with (continued on page 36)

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SCR Propulsion—

(continued from page 35)

a diesel-driven d-c generator powering a d-c motor-driven propeller shaft, each operating independently. To change the direction or speed of each propeller, the voltage of the powering generator would have to be changed and therefore, a failure of one diesel-driven generator results in a loss

of twin-shaft maneuverability. Also, since most electrically driven auxiliaries use a-c power, an independent auxiliary electrical system would have to be installed incorporating two or more diesel-powered generators. This type of system offers no real advantages over the standard gear-driven twin-shaft vessel.

"The offshore-drilling industry began using SCR systems years

ago, and the system has been used also on icebreakers, ferries and other types of vessels. Primary use by the offshore industry has been on self-propelled offshore platforms to provide electrical services where needed.

"It is the first time SCR has ever been used on a workboat.

"Simply put, an SCR propulsion system is, and consists of, two or more diesel-powered a-c

generators feeding power into a 'power pool' through a common switchboard from which electric power is gathered to drive propulsion motors. The latter turn the propeller shafts and wheels.

"From the switchboard, a-c power is fed to SCR units which convert the a-c power into d-c power and then controls the level of the power being fed to each propulsion motor. Electric power from the same switchboard is used to power bowthrusters, towing winches, and other ship's service equipment, including lighting, pumps, air compressors, etc.

"The power pool created is similar to an electrical powerplant for a small community, out of which you can draw as much power as you put into it and distribute this power to wherever you need it.

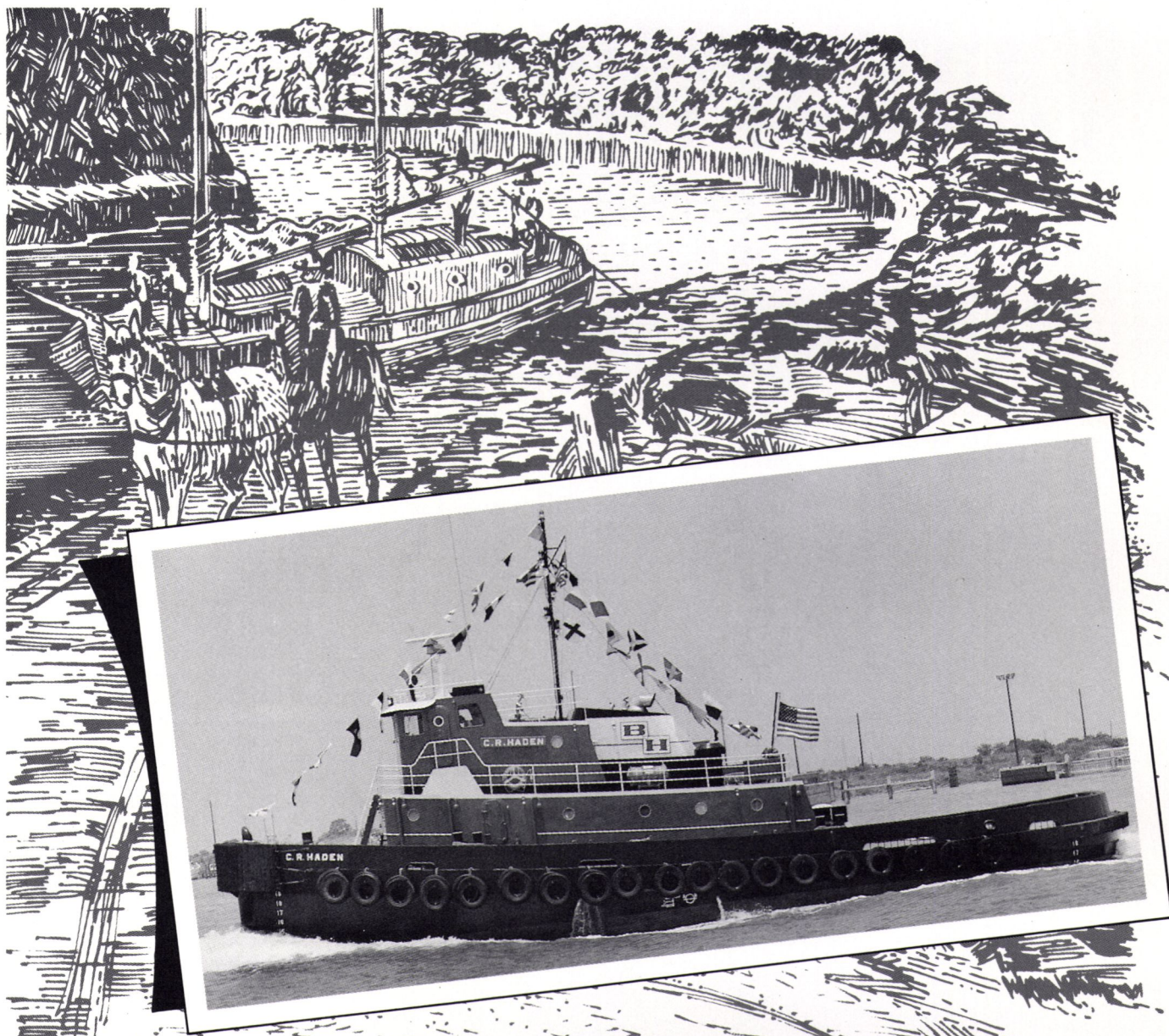
"In a conventional diesel-engine powerplant, torque and developed horsepower is proportionate between fixed minimum and maximum revolutions per minute (rpm). The diesel engine cannot run safely outside of this fixed rpm range.

"In a SCR diesel-electric propulsion system, maximum rated torque is available to the propellers from 0-percent rpm to 100-percent base rpm. Since horsepower equals torque times rpm, the horsepower increases as the rpm increases. But, even further, a d-c motor's rpm can be increased above its rated 'base rpm' by reducing the field current. From 100-percent base rpm to 200-percent rpm, available horsepower remains constant and maximum torque decreases. It should be noted also that the minimum rpm of the diesel engine is about 400 rpm or approximately six knots, which is its idle speed, whereas the speed of the electric motor can be controlled all the way down to 0 rpm or 0 knots.

"With the SCR system, using its field reduction capabilities in the d-c motors, the propeller shaft speed can be increased to the point that all available primary horsepower is being used by the propellers.

"The availability of 100-percent engine horsepower through the top 30 percent to 40 percent of propeller rpm enables the designer to design his propeller for top free running speed/hp/shaft rpm (at approximately 130-percent motor base rpm) and let the reduced speed/shaft rpm situation encountered under towing conditions take care of itself."

Halter Marine Services stated that with SCR controlled propulsion, the tug/supply vessel now being built for Acadian Marine as the Mariner-Class will go farther, faster, quieter, using less fuel, carrying more cargo, with more maneuverability and more reliability, requiring less maintenance, and at a lower cost than conventional tug/supply vessels.



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**Paul-Munroe Hydraulics
Names Mike Lombardi
Marine Administrator**



Mike Lombardi

Ted Munroe, vice president of Paul-Munroe Hydraulics, Inc., and Larry Cloward, marine products and systems marketing manager, announced the appointment of Mike Lombardi as marine operations administrator. Mr. Lombardi's responsibilities will include handling of sales order administration and customer liaison for the Marine Department.

A graduate of the University of San Francisco, Mr. Lombardi was formerly connected with Dresser Industries, where he was involved in marine offshore work.

Paul-Munroe Hydraulics, Inc. is a southern California-based firm marketing specialized hydraulic equipment to the marine, nuclear and process industries on a worldwide basis.

For further information, contact Paul-Munroe Hydraulics, Inc., Engineered Products Group, 1701 West Sequoia Avenue, Orange, Calif. 92668.

**An Assessment Of The
Market For Tankers Of
300,000-DWT And Over**

The recent purchase of 450,000-dwt tankers by Exxon, following on closely from the newbuilding orders placed by Bergesen for two 412,000-tonners with segregated ballast tanks, have created a stirring of interest in ULCCs (tankers of 300,000 dwt and over). These developments come at a time when the ULCC fleet is more adversely affected by the tanker crisis than any other sector of the fleet, in terms of cancellation, inactivity and profitability. In view also of the generally poor prospects foreseen for the tanker market, the recent revival of interest in ULCCs poses some questions. Exxon and Bergesen have been among the most successful charterers and owners, respectively, during the tanker market slump, and for this reason their actions must be taken seriously as an indicator of possible trends.

The HPD survey of "ULCC Trading Opportunities," through an examination of the present ULCC scene and an investigation of likely future developments, concludes that Exxon and Bergesen may indeed prove to be the

forerunners in a sector of the tanker market, which could turn from being the ugly duckling into the swan (although not perhaps the golden goose).

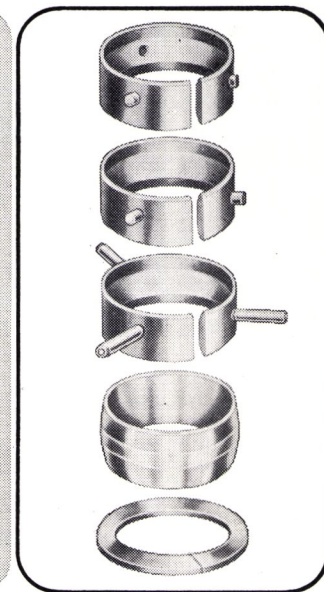
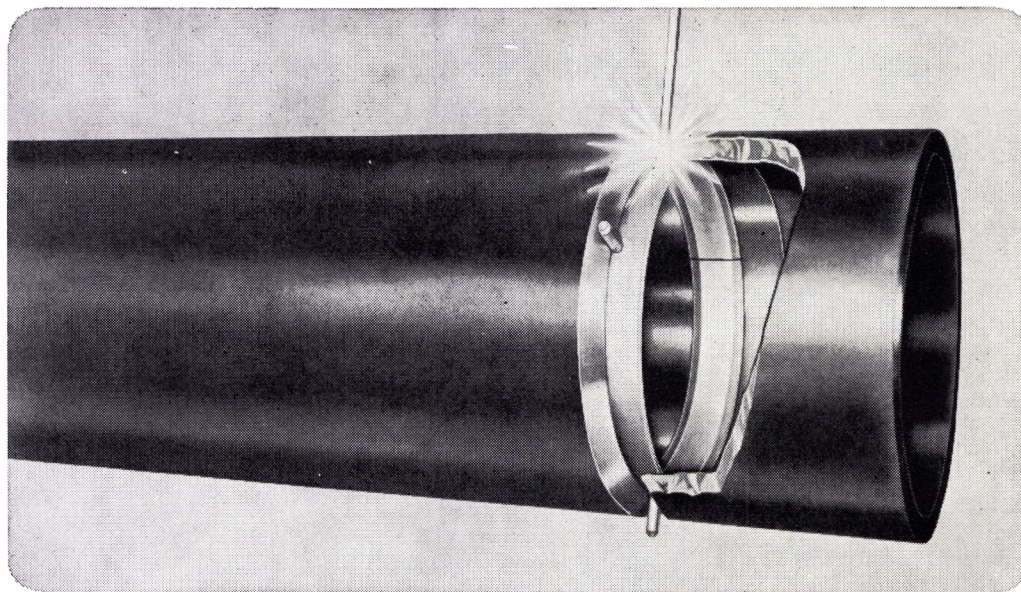
The survey "ULCC Trading Opportunities," includes: (1) An analysis of ULCC fleet developments, showing the effects of the tanker crisis on the size and structure of the fleet; (2) An examination of ULCC trading costs, comparing them with those of

VLCCs; (3) An analysis of ULCC employment, identifying the ports and terminals available for use by ULCCs, the extent of multi-porting and lightening, and the routes used by ULCCs; (4) An examination of the charter market for ULCCs, highlighting trends in single voyage and time-charter rates; (5) An analysis of ULCC commitment to period charters up to the end of 1979, and (6) A forecast of employment prospects

for ULCCs on the basis of comparative trading economics, crude oil trades, and terminal facilities.

"ULCC Trading Opportunities—An Assessment of the Market for Tankers of 300,000-dwt and Over," is published by HPD Shipping Publications, price U.S. \$150 overseas, and £70 per copy in the U.K. To order your copy, write to HPD Shipping Publications, 34 Brook Street, London W1Y 2LL, England.

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Kawasaki Kobe Works Delivers World's First BORO Liner

The world's first BORO liner, the Bellman, built by Kawasaki Heavy Industries Kobe Works, has been delivered to the Swedish owner, Scandinavian Motorships AB of Stockholm.

The vessel is called a BORO liner because it can transport at the same time both liquid and solid cargoes (BORO standing for bulk, oil, roll-on and roll-off). Development of the ship's design was done jointly by KHI and the Swedish company.

The Bellman is designed to carry trailers, containers, automobiles, roll paper, pulp, lumber, cargo oil and many other cargoes. KHI is now building a second vessel of the same type.

The freighter has its engine room and

living quarters at the stern. There are two cargo spaces (car deck and dry cargo deck) under the upper deck, six cargo oil tanks and six water ballast tanks under the dry cargo deck.

As both sides of the multipurpose vessel are designed to have the slopes of an upside-down trapezoid, the ship has good stability and needs only a small amount of water in its ballast tanks to obtain a navigable draft. Its width at the draft level is relatively small and as a result, it can navigate more smoothly than other conventional vessels in seas with ice floes.

The cargo space is substantially bigger than that of conventional vessels, and the ship is also designed to obtain a maximum draft by loading freight oil or other cargoes alone.

Cars, containers and trailers can be loaded

on the upper deck, cars and roll paper on the cardeck, and cars, containers, trailers, roll paper, pulp, lumber and other cargoes on the dry cargo deck.

Two pneumatic fenders are provided on each side of the upper deck so that the vessel, and its unique trapezoid hull section, will not be damaged by the wharf while berthing. The fenders are lowered from the upper deck to act as shock absorbers between the ship's hull and the wharf. These fenders can be moved in all directions and are designed to work freely against the ship's rolling and pitching.

Loading and unloading of cargoes other than oil is done on the basis of the roll-on/roll-off method. Cargoes are loaded from the wharf through a sliding door and rampway at the stern.

A fixed rampway and a 35-ton cargo lift are provided inside the vessel, and they serve for all decks.

In addition to the roll-on/roll-off cargo-handling method, lift-on/lift-off operations for containers can also be employed for the upper deck. This variety of cargo-handling methods and facilities enables the vessel to load and unload cargoes in a short time.

The approximate measurements and principal particulars of the vessel are: length overall, 469 feet; molded breadth, 106 feet; molded depth, 26 feet; gross tonnage, 9,471; deadweight tonnage, 10,665; cargo capacity—cargo oil: 14,501 cubic meters; cargo hold: 26,388 cubic meters. The main engine is a Kawasaki M.A.N. K6Z70/120 diesel with a maximum continuous output of 9,300 hp by 145 rpm, producing a maximum trial speed of 17.7 knots.

The Bellman has a complement of 35, and the planned route is Scandinavia — Europe.

INTEROCEAN MANAGEMENT EQUIPS TANKER FLEET WITH KRUPP ATLAS RADARS! ATLAS 6500 BCA



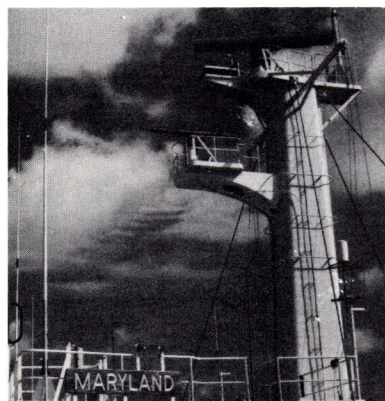
ATLAS 16 in. Radar Display on Bridge of S/S Maryland

After extensive tests and evaluations of Krupp ATLAS 16 inch radars on the U.S. flag tankers S/S ALLEGIANCE (34,800 DWT) and S/S MARYLAND (264,000 DWT), Interocean Management Corp., Philadelphia, decided to install ATLAS radars on a fleet wide retrofit program. On several of their U.S. flag vessels which went into service only last year, the radar equipment originally supplied was replaced by ATLAS radars. The ATLAS radars were supplied through Electro-Nav, Inc., New York.

Because of their proven reliability, Interocean Management Corporation selected the ATLAS 16 inch radars with Basic Collision Avoidance features, types ATLAS 6500 BCA (3 cm, X-Band) and ATLAS 6500 S BCA (10 cm, S-Band). These radars feature:

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ATLAS 6500 BCA

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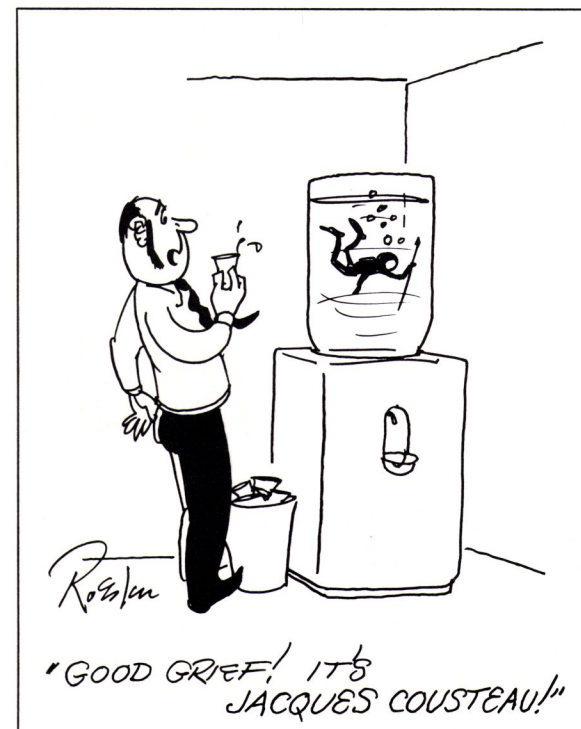
COMPANY _____ PHONE _____

CITY _____ STATE _____ ZIP _____

TYPE OF VESSEL(S) _____

Application Made For Loan To Build Tug-Supply Vessel

Ocean Marine Services Partnership Ship No. 2, Houston, Texas, has applied to the Maritime Administration for a construction loan and mortgage guarantee for one ocean-going tug-supply vessel of 4,800 horsepower. The craft, estimated to cost some \$3 million, is to be built by American Marine Corp., New Orleans, La. It will be chartered to major oil companies, the application explained, for offshore towing, supply, and service of drilling rigs here and abroad.



A black and white photograph of a large industrial shipyard. A massive white lattice boom crane is lifting a large, dark, rectangular section of a ship's hull. The crane's boom extends from the right side of the frame towards the top left. The hull section is suspended by several cables. In the background, other parts of the ship and industrial structures are visible. The sky is overcast.

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FMC

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G.E. 1500 KW A.C. TURBO GENERATORS

- 1 1500 KW — 450/3/1200 RPM — 0.8 P.F. — 2450 amps — 525 PSI — 850° TT — 8145 RPM — 11-stage geared 8145/1200 — type FN4 — 3 1/2" steam inlet. Unit will deliver full power at 440 lbs & 760° TT. OAL 16' 3-3/8" — OAW 6'6" — OAH 7'5 1/4" — wt. 36000 lbs. Almost equal to new. Very little use. With ABS or Lloyds.

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. Temperature 740° — 9977 RPM. HELICAL GEAR: 9977/1200 RPM. Serial # of turbine 245204 — weight 22,000 lbs.

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- 7 1 HP Turbine or rotor — Bethlehem
1 400 KW Stator only — Westinghouse
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1 Complete Westinghouse 400 KW turbo generator set
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- 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
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- 9 Large Victory or C-3
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10 Boxes spare parts, tools & fittings. With maneuvering valves.

8500 HP G.E. — C-3 OR VICTORY

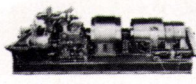
- 10 H.P. — 8-stage — 6159 RPM — serial 62043
L.P. — 8-stage — 3509 RPM — serial 62042
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VICTORY SHIP AUXILIARY TURBO GENERATOR SET ROTORS

- 11 300 KW 5965 RPM JOSHUA HENDY
Turbine — 3H-69 Gear — 52269
Turbine — 3H-52 Gear — 52252
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— 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

- 18 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

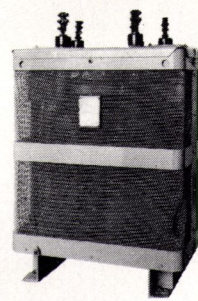
- 24 G.E. Model 5M505FE-1 — frame 5055 — type M — 440/3/60 — serial S.E.6731807. Controller available. (Complete with fan impeller)

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

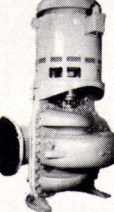
28

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

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

30



WESTINGHOUSE 200 H.P. CARGO PUMP MOTORS

31

440/3/60 1750 RPM — 40°

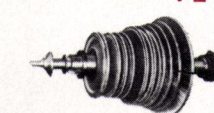
MISSION TANKER T2SEA2 CIRCULATING PUMP MOTOR

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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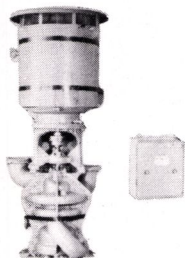
NEW BLACKMER FUEL OIL TRANSFER PUMP

36



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

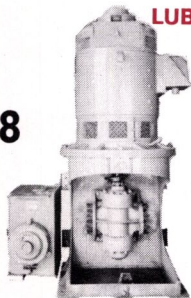
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UNUSED BRONZE FEED-WATER BOOSTER PUMPS

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

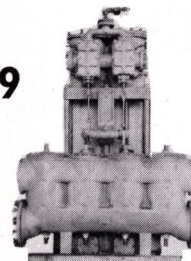
38



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.

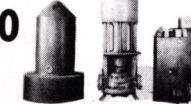
39



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.

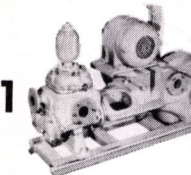
40



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.

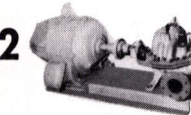
41



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.

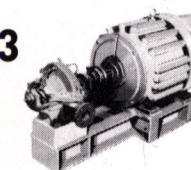
42



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.

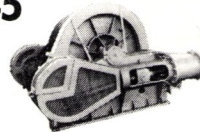
DIESEL GENERATOR SETS

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/50
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.

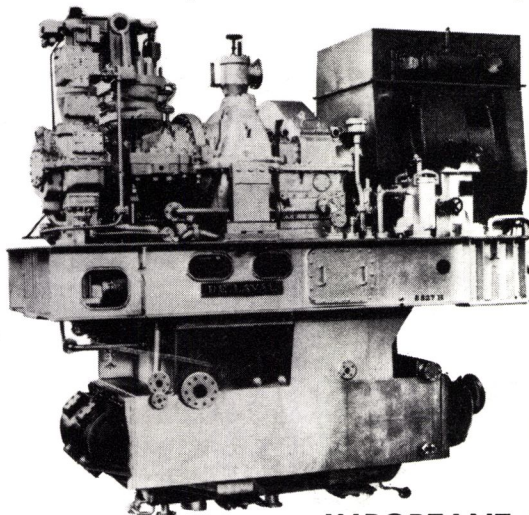
MISCELLANEOUS

47

IF YOU'RE GOING TO JUMBO-IZE YOU CAN ECONOMIZE WITH THESE

ALLIS-CHALMERS — DELAVAL 1000 KW GEARED MARINE TURBO-GENERATORS

If you are contemplating the new construction of
TANKERS, ORE CARRIERS, CONTAINER VESSELS, ETC.



YOU CAN SAVE THOUSANDS OF DOLLARS

with these modern, practically new
units — built to highest Navy stand-
ards. Send for our free descriptive
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-
stalled larger units due to increased load requirements.

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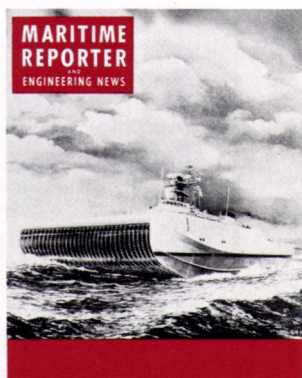
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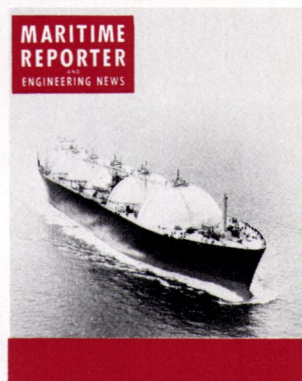
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Drew Chemical Corp. Promotes Walter Smith



Walter A. Smith

Raymond M. Burke, group vice president, Drew Chemical Corporation, Parsippany, N.J., has announced the promotion of **Walter A. Smith** to director, consulting and technical services, Marine Division. In his new position, Mr. Smith will be responsible for establishing technical support groups in both Europe and the Far East. This will provide more effective and efficient service to

Drew Marine customers. Mr. Smith served previously as technical director, Marine Division, and will continue with this responsibility for all technical support to the division's sales activities worldwide.

A graduate of the State University of New York Maritime College at Fort Schuyler, Mr. Smith joined Drew in 1976. He served previously as manager of power generation and distribution for Allied Chemical Corporation. Prior to that, he was employed by E.I. du Pont de Nemours, and also by Exxon Affiliates as a utilities advisor in Holland, Singapore, the Philippines, Thailand, and Okinawa.

Mr. Smith is a licensed professional engineer in the states of New York, New Jersey, and South Carolina.

Drew Chemical, a subsidiary of United States Filter Corporation, is a major supplier of products and services for water management and specialty chemicals for the industrial and marine markets.

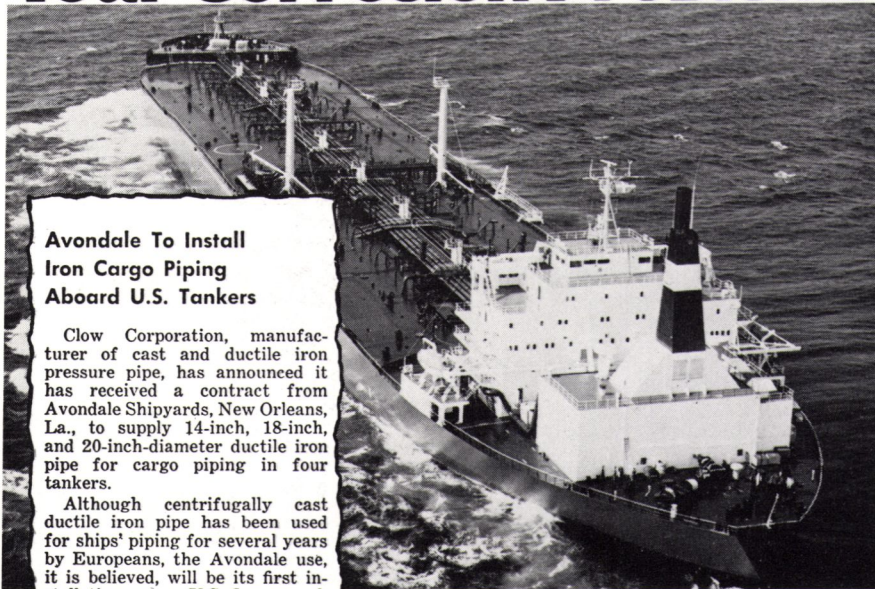
Kaiser Building Fifteen Mammoth All-Welded Aluminum LNG Tanks For Ships At Avondale



Complexity of construction of the liquefied natural gas tanks being fabricated by Kaiser Aluminum at its Mobile, Ala., plant can be seen in this aerial photograph. In the background is a tank nearing completion, and the "Mobile giant" derrick which will lift the tanks into the LNG ships.

CLOW

Has The Answer To Your Corrosion Problems



Avondale To Install Iron Cargo Piping Aboard U.S. Tankers

CLOW Corporation, manufacturer of cast and ductile iron pressure pipe, has announced it has received a contract from Avondale Shipyards, New Orleans, La., to supply 14-inch, 18-inch, and 20-inch-diameter ductile iron pipe for cargo piping in four tankers.

Although centrifugally cast ductile iron pipe has been used for ships' piping for several years by Europeans, the Avondale use, it is believed, will be its first installation on a U.S.-flag vessel. Pipe selected is standard 60,000 tensile ductile pipe which is in widespread use for underground pressure piping, except that the ductile iron will be alloyed with 2 percent nickel for added corrosion resistance. Pipe will be plain

CLOW Ductile pipe and fittings, alloyed with 2% nickel, offer the most economical corrosion resistance for cargo or ballast piping. For crude

A series of huge aluminum tanks nearing completion in Mobile, Ala., soon will be playing a significant role in helping the nation meet its energy requirements.

The 15 mammoth all-welded containers are being assembled by Kaiser Aluminum & Chemical Corporation on nearby Pinto Island for eventual use in three liquefied natural gas (LNG) ships under construction at Avondale Shipyards in New Orleans, La. The 125,000-cubic-meter ships will be operated by subsidiaries of El Paso Natural Gas Company to transport natural gas at cryogenic temperatures (minus 260 degrees F) from gas fields in Algeria to East Coast markets.

The multimillion-dollar project is the largest of its type in LNG history, and the tanks are the first of their design ever built in this country.

The tank dimensions are im-

ect. Aluminum plate up to 11½ inches in thickness is provided by the company's Ravenswood, W. Va., Works. Extrusions are from Kaiser Aluminum's Halthorpe, Md., plant; forgings from Erie, Pa., Works; and the total welding wire requirements of some 500,000 pounds are being supplied by the company's Newark, Ohio, Works.

The largest of the Conch-design rectangular containers weighs approximately 950 tons, while the smaller ones weigh approximately 700 tons. They are being assembled at ground level and will be lifted into place in the ships by a huge twin-boom derrick which has been specially constructed for the purpose at the Mobile site.

The first tank is scheduled for lift in approximately 30 days, according to **T.H. Johnson**, Kaiser Aluminum LNG project manager, and the ships are expected to be

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The multimillion-dollar project is the largest of its type in LNG history, and the tanks are the first of their design ever built in this country.

The tank dimensions are impressive. They are being assembled in sets of five, and vary in size and configuration depending on where they will be placed. The largest are the three that will be in the center of the ship, with each approximately 120 feet long, 120 feet wide, and 75 feet high.

More than 27 million pounds of Kaiser-developed 5083 aluminum plate, extrusions, and forgings are being used in the tank proj-

ect. Aluminum plate up to 11½ inches in thickness is provided by the company's Ravenswood, W. Va., Works. Extrusions are from Kaiser Aluminum's Halthorpe, Md., plant; forgings from Erie, Pa., Works; and the total welding wire requirements of some 500,000 pounds are being supplied by the company's Newark, Ohio, Works.

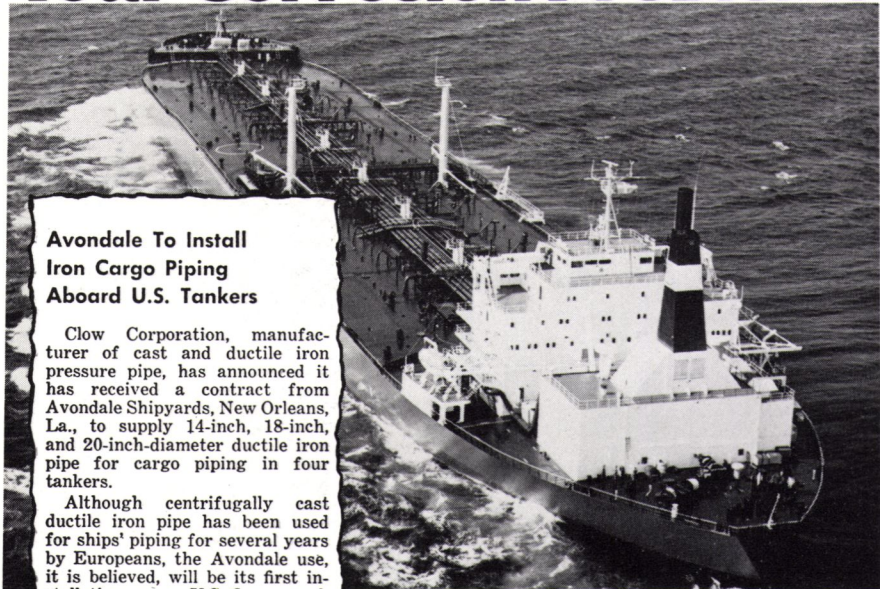
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The first tank is scheduled for lift in approximately 30 days, according to **T.H. Johnson**, Kaiser Aluminum LNG project manager, and the ships are expected to be completed in 1978.

The tank fabrication itself is a two-step process. Individual component panels were assembled at a plant in Wilmington, N.C., using sophisticated processing equipment and automated welding techniques. The subassembly panels, which weighed up to 60 tons each, then were transported to Mobile by a large oceangoing barge. The barge had a capability of carrying

CLOW

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Although centrifugally cast ductile iron pipe has been used for ships' piping for several years by Europeans, the Avondale use, it is believed, will be its first installation on a U.S.-flag vessel. Pipe selected is standard 60,000 tensile ductile pipe which is in widespread use for underground pressure piping, except that the ductile iron will be alloyed with 2 percent nickel for added corrosion resistance. Pipe will be plain end and joined by couplings. Ductile was chosen on the basis of an anticipated extended life in service, despite a higher initial cost.

The choice of ductile pipe was made following U.S. Coast Guard and American Bureau of Shipping approval for the use of this pipe for "cargo and ballast systems."

Clow Ductile pipe and fittings, alloyed with 2% nickel, offer the most economical corrosion resistance for cargo or ballast piping. For crude, saltwater, or similar service, investigate Clow Ductile. Clow's cargo and ballast piping meets or exceeds the requirements of the American Bureau of Shipping and U.S. Coast Guard.

CLOW CORPORATION
PIPE PRODUCTS GROUP
P.O. BOX 516 • BENSVILLE, IL 60106

all 24 panels needed for one finished tank, plus the smaller brackets and parts.

Upon arrival in Mobile, the panels are assembled into a tank much the same as a ship is built, with subassembly fitting and welding into place. Workmen then complete installation of all internal tank piping and instrumentation.

Kaiser Aluminum developed special welding procedures for the project, with particular emphasis on quality control. All automatic butt welds undergo X-ray and tensile testing to insure that requirements are met, and stringent inspection is followed on all manual weld operations.

When the tanks are finished, they are transported into position for eventual placement aboard ship by specially designed crawlers. Four of the 300-ton-capacity diesel-powered vehicles are used, one under each corner of the individual tanks.

While the aluminum containers are being fabricated in Mobile, Kaiser Aluminum also is insulating the three LNG ships at Avondale Shipyards. The company is the prime contractor for installation of a special polyurethane foam system in the holds of the carriers.

The insulation is a combination of balsa wood corners and tank support piers, nylon mesh reinforced polyurethane foam, and fiberglass. Although not in the insulation contracting business, Kaiser Aluminum developed the special cryogenic foam and perfected the procedures to install it in the LNG ships. In addition to its insulating characteristics, the system has been designed as a secondary liquefied natural gas barrier, with built-in structural support for the cargo tanks.

Quality control and testing procedures on the projects are continuous and exceedingly strict. At Mobile, not only is there a stringent Kaiser Aluminum inspection program in operation, but one by the Coast Guard and by the American Bureau of Shipping as well. All shell welds undergo 100 percent X-ray inspection, and each finished tank is then hydrostatically tested to insure integrity of the container.

Hydrostatic testing procedures for the tanks were developed by Kaiser Aluminum, Conch, the Coast Guard, and the ABS. Each tank is more than half filled with water, which in the case of the larger tanks is approximately four million gallons, and then eight pounds of air pressure is placed on the surface of the water.

Testing and inspecting during the foaming operations at Avondale Shipyards and at the Wilmington plant are equally strict, not only by Kaiser Aluminum inspectors but also by the American Bureau of Shipping and the United States Coast Guard.

MARCO Deck Machinery Ordered For Poland

Marine Construction and Design Co. (MARCO), 2300 West Commodore Way, Seattle, Wash. 98199, recently received an order from Poland's national marine agency, Centromor, for 10 sets of hydraulic machinery to be installed on tuna seiners presently under construction for the USSR.

The order was formerly negotiated by MARCO executives during a visit to Poland earlier this year.

Each of the 10 sets includes a MARCO Puretic Power Block with Power Grip and a 200-hp electrohydraulic power pumping unit.

The MARCO Puretic Power Block hauls with a pull of 7 tons and with a speed of 265 fpm.

In 1974, MARCO supplied Centromor with six sets of hydraulic deck machinery for 53-meter (174-foot) tuna seiners which were being built in Poland for Mexico. John R. Logan, MARCO vice president of sales, noted that the successful operation of those sets was an important factor in Centromor's decision to again use MARCO hydraulic deck machinery.

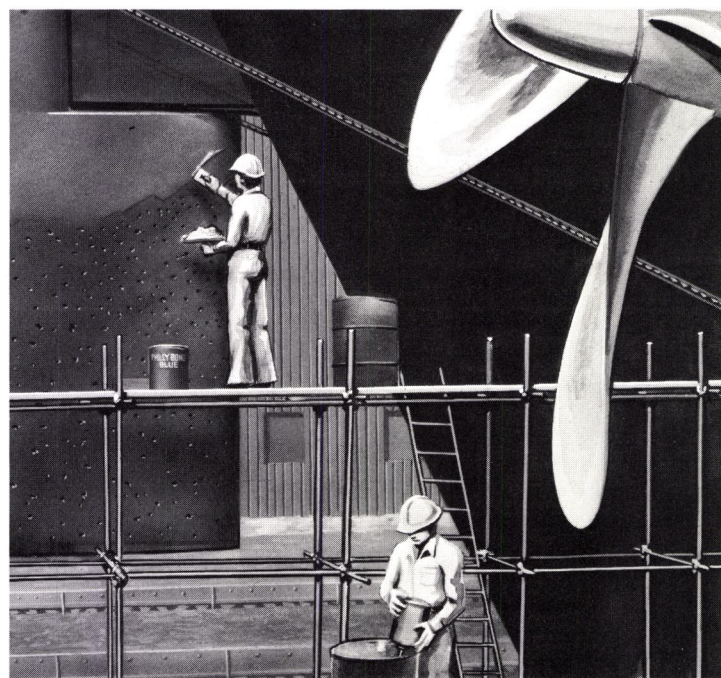
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For older vessels, PHILLYBOND BLUE is unexcelled for fairing and smoothing rough or pitted rudder and hull surfaces.

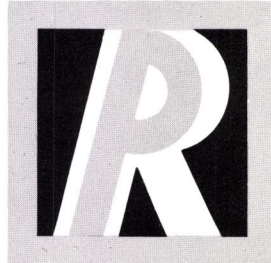
The smooth consistency and excellent non-sagging properties of PHILLYBOND BLUE make it unexcelled for leveling rough or pitted plating, forming fillets or smoothing weld seams. PHILLYBOND BLUE is particularly useful in preparing rough or pitted surfaces of hulls, tanks, sonar domes for top coating or lining. This easy-to-apply fairing and smoothing compound retains tenacious bond under extremes of temperature, shock and environment.

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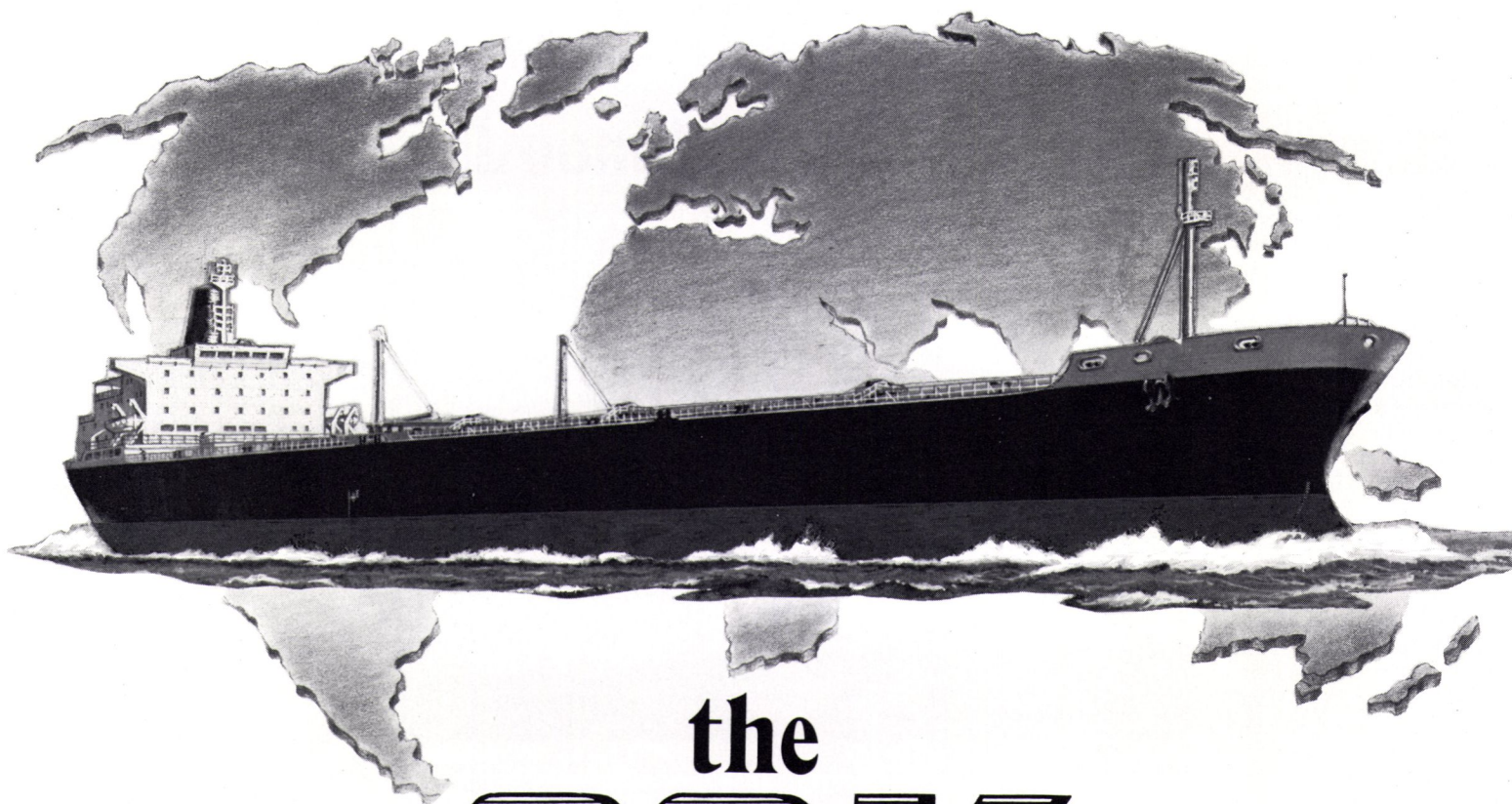
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Stanley Stiansen Elected By ABS



Stanley G. Stiansen

Stanley G. Stiansen, an assistant vice president of the American Bureau of Shipping, was elected a vice president of ABS at the semiannual meeting of the board of managers held in New York City, chairman and president Robert T. Young announced. The election takes effect November 1.

Mr. Stiansen joined the international ship classification society in 1947 as a Surveyor in the Hull Technical Department. In 1949, he resumed his educational studies, and worked in various marine-related activities. He was employed as a design supervisor of the hull scientific group for New York Shipbuilding Corporation for six years, as assistant naval architect in the new construction department of Moore McCormack Lines for five years, where he worked on the construction of the large passenger cargo ships, the Brazil and Argentina, and as an attorney with an admiralty law firm for three years.

In 1965, Mr. Stiansen rejoined ABS as a Surveyor in the Hull Technical Department. He was appointed Senior Surveyor of the Research and Development Division in 1970, chief research engineer in 1973, and an assistant vice president in 1976.

Mr. Stiansen holds a B.S. degree in naval architecture and marine engineering and an LL.B. degree in law from the University of Michigan. As a senior in engineering college, he was awarded the ABS prize for excellence. He also studied at the Graduate School of Engineering of Columbia University.

A registered professional engineer in the State of New York, Mr. Stiansen is a member of The American Society of Mechanical Engineers and The Society of Naval Architects and Marine Engineers (SNAME). He serves on two SNAME panels (Slamming, and Design Procedure and Philosophy), and has authored several technical papers presented at Society meetings. He is also a member of the Ship Structure Subcommittee, an organization sponsoring research in shipbuilding, and has served as chairman of the subcommittee since June 1976. In addition, Mr. Stiansen is a member of the American Concrete Institute (ACI) Committee on Recommended Practice for Use of Concrete in Fixed Offshore

Structures, and a member of the International Association of Classification Societies (IACS) Working Party on Strength of Ships. He is also a member of the International Ship Structures Congress (ISSC) Committee on Design Procedure.

Mr. Stiansen is a member of the New York State Bar, the American Bar Association, and the New York County Lawyers Association.

Dixie Dredge 20-Page Brochure Now Available

The Dixie Dredge Corporation, pioneer manufacturer of portable dredges, has published a 20-page brochure replete with color photos describing the many different types of dredges the company builds.

The company expression, "A Dixie Dredge for Every Purpose,"

is substantiated by the many models shown.

A succession of photographs shows the various stages in the construction of a Dixie dredge, from the translation of the customer's requirements to the finished product ready for work.

For a free copy of this very informative brochure, write to James V. Bishop, The Dixie Dredge Corporation, 8224 Polk Street, St. Louis, Mo. 63111.

WHAT MAKES TODAY'S BRONS ENGINE AS DEPENDABLE AS YESTERDAY'S? IT'S SIMPLE.

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Many manufacturers equate complexity with power. The Brons technical people have spent over 60 years keeping their engine uncomplicated as they increased its power. This outlook has kept both the Brons and the American Brons engines easy to maintain with a minimum of care.

Another idea that the Brons people hold to is this: keep the engine economical to run. They've done just that. The Brons TD250 squeezes more power from its fuel than the first Brons did back in 1915. That's progress.

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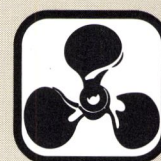
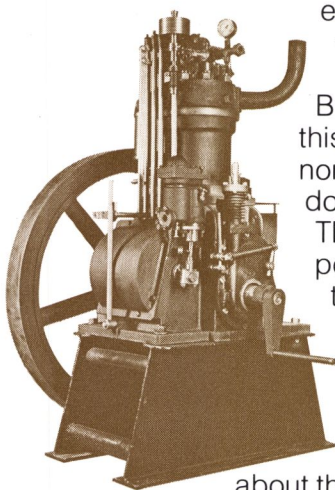
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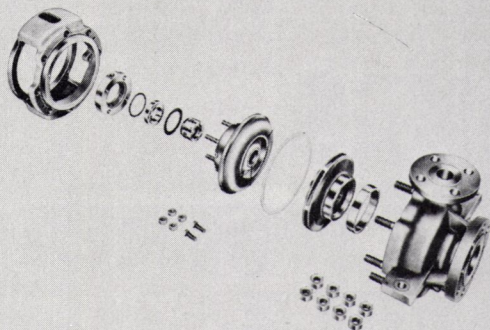


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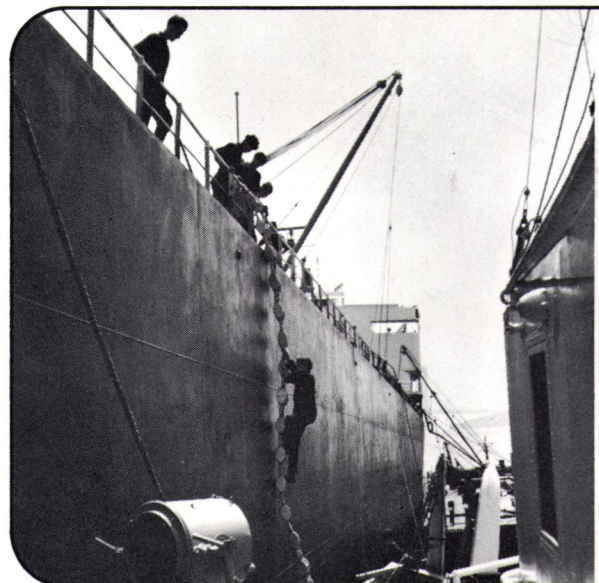


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New Henschel Engine Order Telegraph Catalogs Available

Henschel Corporation has announced the introduction of two new Engine Order Telegraphs. This rugged, reliable equipment is used to transmit engine orders and replies between the wheelhouse and engine room. These lever-operated transmitter/indicators are designed for console mounting, and wheelhouse units are readily visible from all bridge locations.

Henschel's new Engine Order Telegraphs are available as single-lever units for single-engine vessels and double lever units for ships with double engines or shafts. Bell logger contacts are provided in all units. Other standard features include a built-in constant-ringing circuit, eliminating the need for a separate Constant Ringing Relay Panel as part of the Engine Order Telegraph system. Units may be arranged with dials and switch contacts, etc., to suit any specific application.

They are the latest additions to Henschel's extensive line of engine order telegraphs, throttle controls and other ship control equipment. These two new low-cost engine order telegraphs are especially designed for reliable operation in the marine environment and are designed to meet all the present requirements of the U.S. Coast Guard.

They are designated as Catalog No. 10-2303 Series (for single engine applications), and the Catalog No. 10-2300 Series (for double engine applications).

For further information, contact **John G. Landers**, Henschel Corporation, 14 Cedar Street, Amesbury, Mass. 01913.

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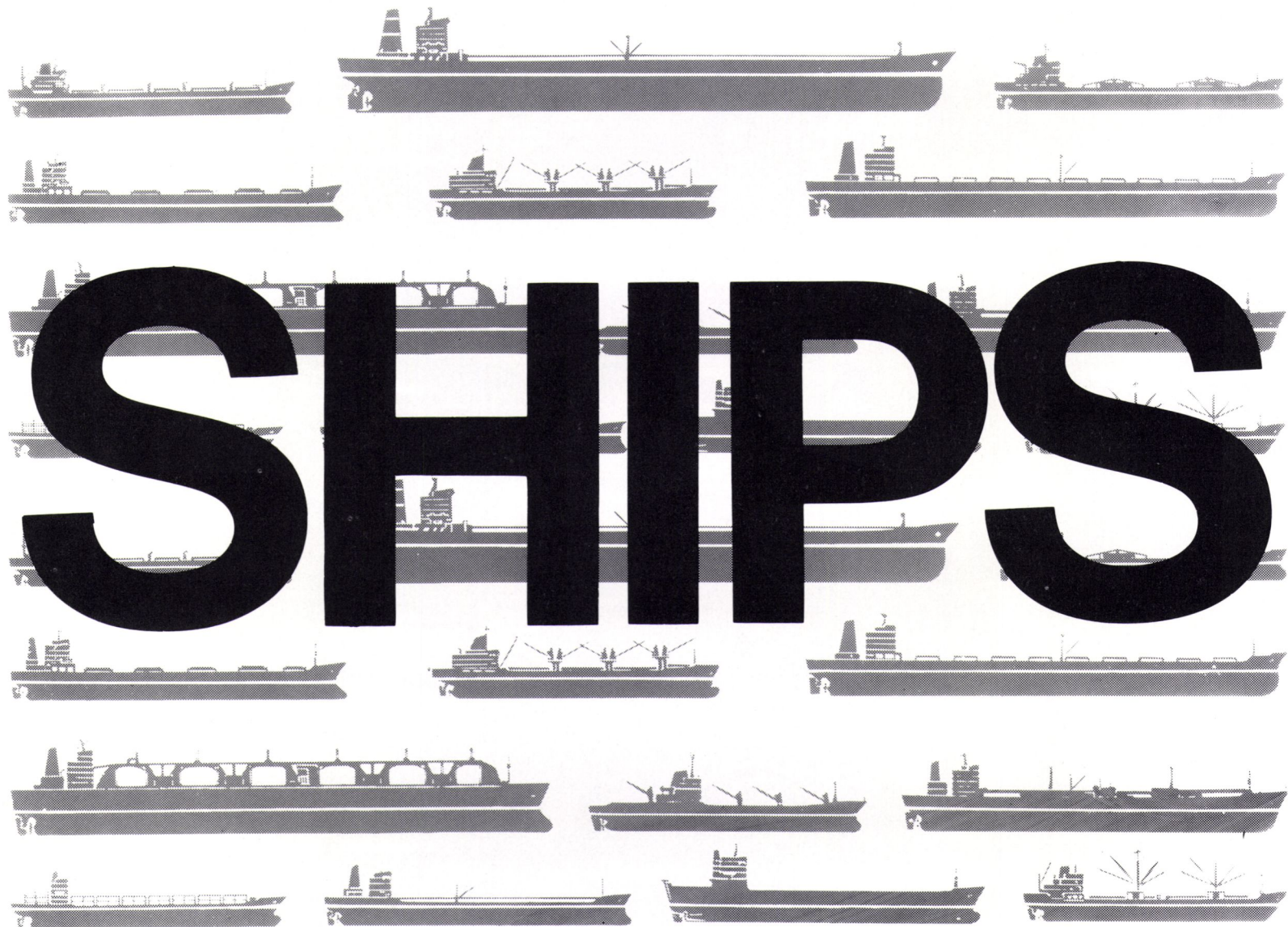
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Port Of Hueneme Retains John J. McMullen Associates To Prepare Master Plan

The Port of Hueneme (Calif.), Oxnard Harbor District, has retained John J. McMullen Associates, Inc., naval architects, marine engineers and transportation consultants of One World Trade Center, New York, N.Y. 10048, to prepare a master development plan for the port, in accordance with the requirements of the California Coastal Act of 1976.

The contract calls for definition of market opportunities for the Port through the year 2000, and a development of a statement of

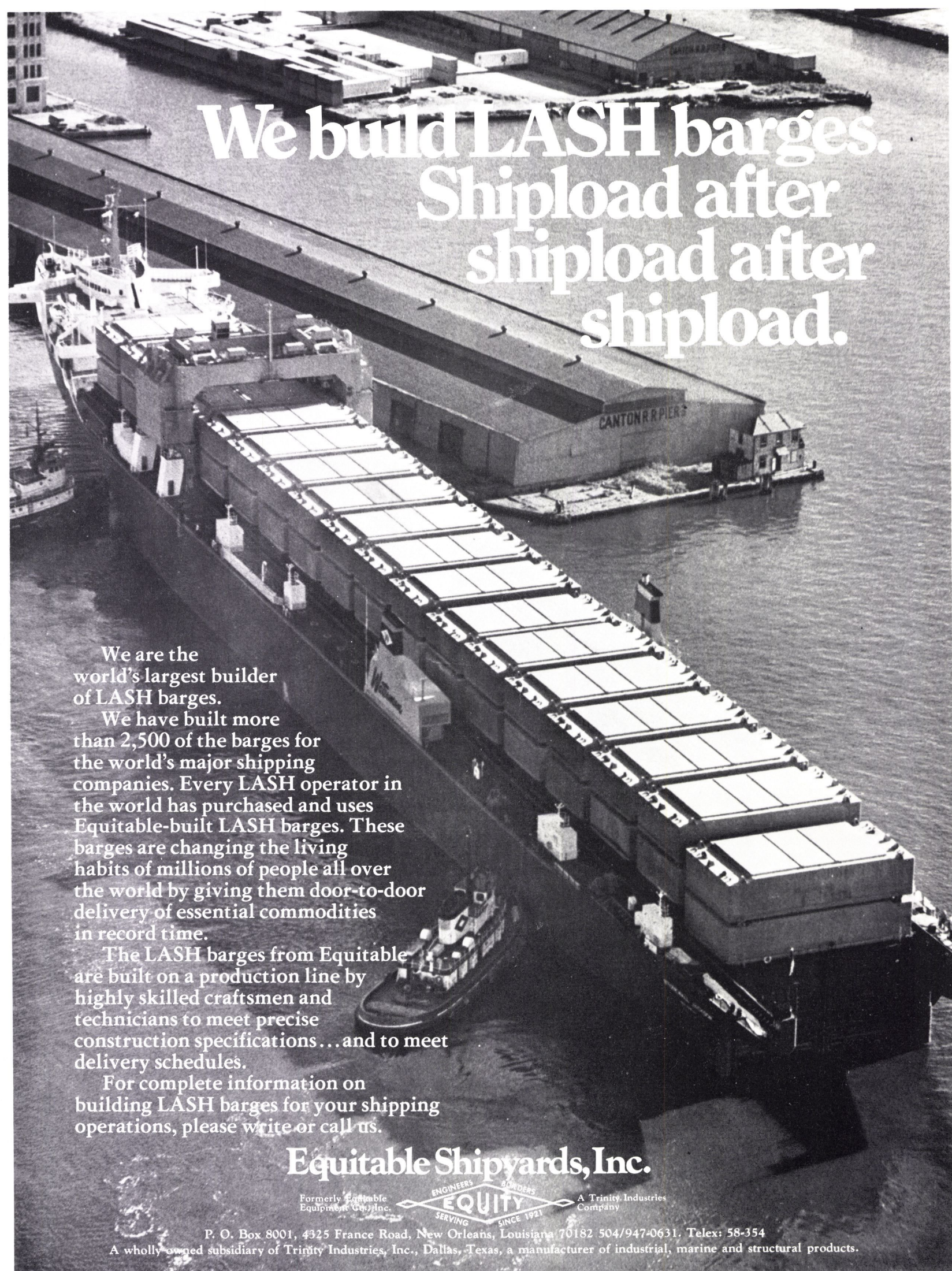
the jurisdiction of the Oxnard Harbor District which relate to marine activity. The final report will define both a preferred development plan and a number of alternatives, the latter arising from variations in such factors as the availability of land for expansion and the rate of growth of port activity.

Consideration will be given in the report to potential environmental problems and in addition, an economic analysis of the benefits of port activity to the surrounding community will be prepared.

The Port of Hueneme, one of four southern California ports required by the new legislation to file a master plan for its development, is experiencing a marked increase

up on those of the previous period, as new port activities have been introduced and as old clients have expanded their operations.

John J. McMullen Associates, Inc., is a diversified consulting firm with clients throughout the international marine and transportation industry. Services offered include planning, design, engineering and management consulting in connection with all kinds of marine activity, including ports and terminals, shipyards, naval and commercial ships and shipping systems and related industries. McMullen Associates maintains offices in New York City, Oxnard, Calif., Washington, D.C., Hampton Roads, Va., Bath, Maine, London, England, and Madrid,



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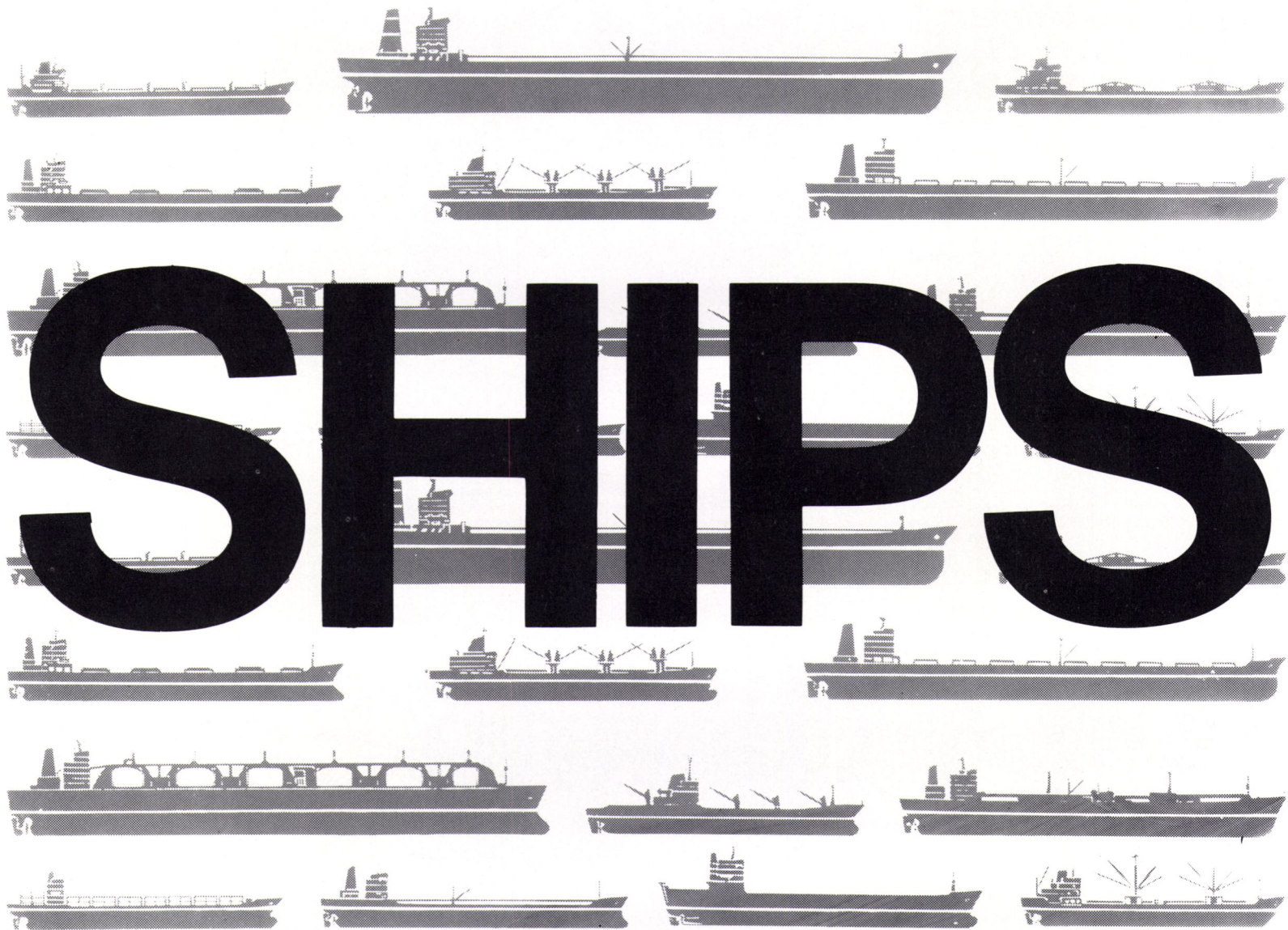
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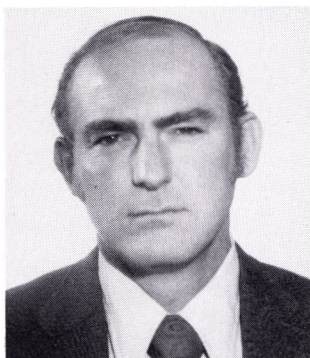
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Oceaneering Int'l Names Thomas West



Thomas C. West

Oceaneering International, Inc., 10575 Katy Freeway, Houston, Texas 77024, has announced the appointment of **Thomas C. West** as manager-Welding Development Program. The welding development operations are based in the company's Morgan City, La., office. Mr. West is responsible for coordinating and advancing Oceaneering's underwater welding capabilities in support of the offshore oil industry and other underwater installations.

Prior to joining Oceaneering, Mr. West spent 18 years working for the U.S. Navy in many phases of welding, from interpretation of nondestructive test results in support of welder qualification and production welding, to serving as technical manager of the Navy's underwater welding program in connection with Naval ship deactivation.

Oceaneering is one of the world's largest diving and underwater construction contractors.

Dredge Technology Corp. Formed In New York

John J. McMullen Associates, Inc., naval architects, marine engineers and consultants of New York, N.Y., and IHC-Holland of Rotterdam, the Netherlands, announce their joint establishment of Dredge Technology Corporation at Suite 3000, One World Trade Center, New York, N.Y. 10048. Dredge Technology Corporation, which is 50 percent owned by each of the sponsoring corporations, will provide U.S. dredging companies, shipyards and government agencies with the design and engineering services required for construction and modification of all types of dredges. Dredge Technology Corporation will also be prepared to provide a full range of dredging equipment to such parties, utilizing the technology and equipment developed by IHC-Holland over the past 100 years.

Dredge Technology Corporation will have full access to the specialized know-how, experienced and technology of both companies, with particular respect to the highly specialized experience and knowledge of IHC-Holland in the field of dredge technology. The first project assigned to Dredge Technology Corporation is the contract design of a new

4,300-cubic-meter trailer suction hopper dredge of split-hull design, which will utilize a design concept originated by IHC-Holland. McMullen Associates will be responsible for preparation of the contract drawings and regulatory body approvals to American standards and practice.

John P. Martin has been designated as president of Dredge Technology Corporation. Mr. Martin is a graduate of Virginia Poly-

technic Institute with a B.Sc. degree in naval architecture, and holds an M.S. degree in nautical engineering from Stevens Institute of Technology. Mr. Martin has been associated with John J. McMullen Associates, Inc. since 1965, and for the past several years has served as vice president of that company's Flume Stabilization System Division.

McMullen Associates is an engineering consulting company

serving the marine transportation industry in areas of naval architecture, marine engineering, transportation economics, and project management.

IHC-Holland is the largest supplier of dredge engineering and technology in the world, and has four building yards in Holland. The company has provided more than 150 dredges of various types and sizes to the world market in the past five years.



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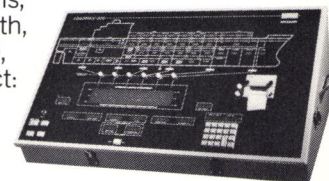
Face it. Time is money. And so is accuracy when you're making load distribution calculations. So, if you have a way to make them faster than a LOADMAX system can, don't read any further. If not, then our LOADMAX story could open the door to greater profit per voyage for your ships.

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to make stability, draft and stress calculations simultaneously in a fraction of the time required by other calculation methods. And with unsurpassed accuracy.

If you're a shipowner you probably already know about Raytheon's reputation for reliability and service. Now, if you're interested in maximizing your ship's profitability, there's a lot more you should know about the Raytheon LOADMAX. To get the whole story contact the Marketing Manager at Raytheon Company, Maritime Systems, West Main Road, Portsmouth, R.I. 02871. (401) 847-8000, ext. 2236. In Europe contact: Raytheon Copenhagen, Siljengade 6, Copenhagen 2300, Denmark.



RAYTHEON

November 1, 1977

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John J. McMullen Associates
To Prepare Master Plan**

The Port of Hueneme (Calif.), Oxnard Harbor District, has retained John J. McMullen Associates, Inc., naval architects, marine engineers and transportation consultants of One World Trade Center, New York, N.Y. 10048, to prepare a master development plan for the port, in accordance with the requirements of the California Coastal Act of 1976.

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the jurisdiction of the Oxnard Harbor District which relate to marine activity. The final report will define both a preferred development plan and a number of alternatives, the latter arising from variations in such factors as the availability of land for expansion and the rate of growth of port activity.

Consideration will be given in the report to potential environmental problems and in addition, an economic analysis of the benefits of port activity to the surrounding community will be prepared.

The Port of Hueneme, one of four southern California ports required by the new legislation to file a master plan for its development, is experiencing a marked increase in activity — operating revenues in the year ended June 30, 1977 were almost 50 percent

up on those of the previous period, as new port activities have been introduced and as old clients have expanded their operations.

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O.A.R.N.

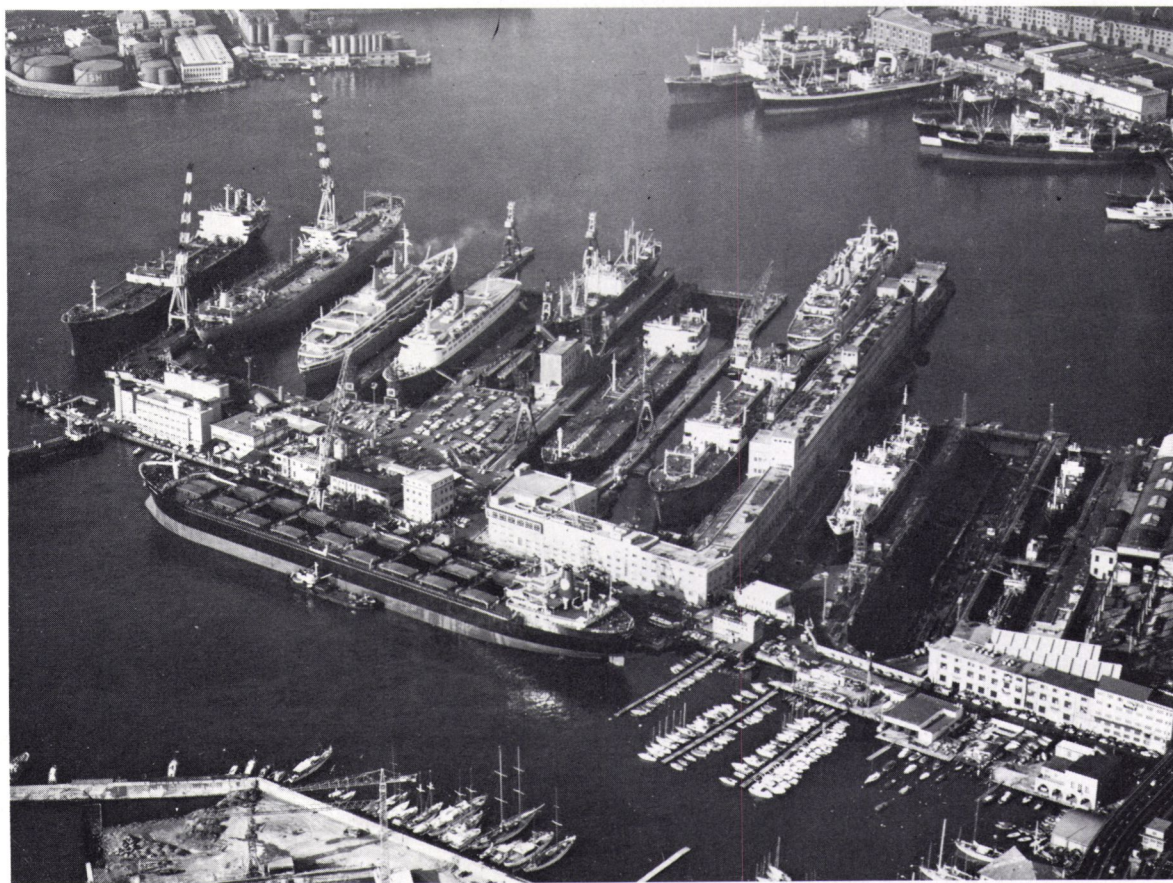
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Continental Marine Agency, Inc. (James R. Porter),
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**New Marine Fenders
For Large Tankers**

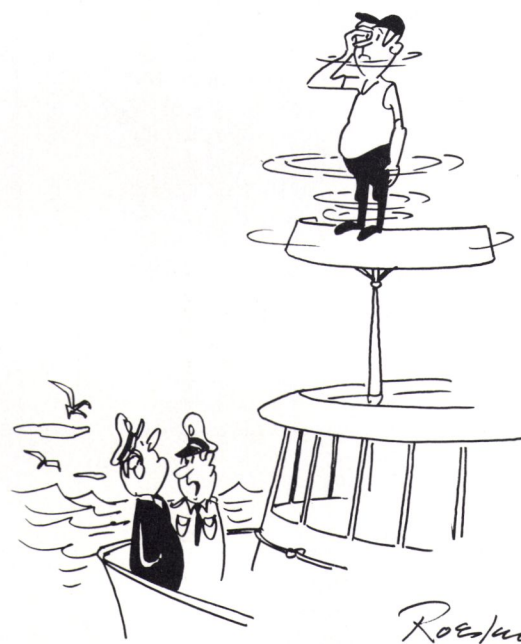
New marine fenders, designed mainly for use by supertankers as they unload to smaller tankers 20 to 50 miles offshore, are being introduced by Seaward International, Inc., Falls Church, Va. Called "Sea Cushion," each of the large fenders is about 20 feet long and 10 feet in diameter. Typically, larger ships will have four large fenders and two smaller ones over the side.

The advantage of Sea Cushion is that the fenders are filled with a flexible foam that absorbs impact energy. Each fender is covered with a 3/4-inch-thick tough elastomer jacket, made of Uniroyal Chemical's Vibrathane urethane, reinforced by nylon cord.

A nylon web net — the key feature of the new fender — also coated by Vibrathane, provides a smooth, non-sparking, low-friction, abrasion-resistant exterior. This is especially important around explosive cargo.

Vibrathane urethane is a liquid that is cast, in this case, around the flexible foam of the Sea Cushion, then hardened until it is set. Toughness and long-term durability are its outstanding properties, which is why it has been chosen for such arduous applications as skateboard wheels.

For more information about Sea Cushion, write to Seaward International, 6269 Leesburg Pike, Falls Church, Va. 22044, attention of Sidney Shaw.



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Tidewater chose the Red Fox MSD for efficiency of operation today, and because it exceeds future standards to avoid the necessity for costly changeovers later.

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The logo for Red Fox Industries, Inc. features a stylized white fox head silhouette to the left of the word "redFox" in a bold, lowercase sans-serif font. Below "redFox" is the text "Industries, Inc." in a smaller, lowercase sans-serif font.

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**IMODCO Establishes
Houston, Texas Office
—M.D. Jackson Named**

IMODCO, pioneer company in the development of offshore single-point mooring (SPM) terminals, announces the formation of a regional marketing office in Houston, Texas. The facility is located at 2300 West Loop South, Suite 290, in the Litwin Building.

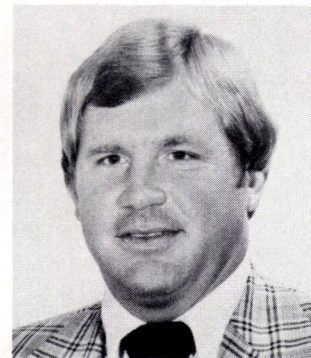
Michael D. Jackson has been appointed to the position of regional manager of marketing, southern United States, and will direct the efforts of this office toward providing local attention to the increasing number of inquiries from this and other areas of the Gulf Coast concerning single-point mooring systems.

According to Alfred W. Allchorn, senior vice president of

marketing, the increasing development of offshore petroleum and the subsequent escalation in requirements for SPM systems to provide petroleum storage and transfer facilities requires on-the-spot representation.

A native Texan, Mr. Jackson is well acquainted with the marine and offshore industry. He has most recently been associated with ETA Engineers, Inc., Hous-

ton, as project coordinator, and with Marathon Marine Engineering Co., Houston, as marine engineer. Earlier, he served in the Marine Department of Texaco Oil Corporation.



Michael D. Jackson

Mr. Jackson attended Texas A & M University during 1968-69, and later received Congressional appointment to the United States Merchant Marine Academy, Kings Point, N.Y., where he was graduated in 1973. He also performed postgraduate studies in engineering at the University of Houston, and has been a lecturer/instructor in naval architecture at Texas A & M University Maritime Academy, Galveston, Texas, since 1975.

IMODCO, a division of Amtel, Inc., has been a pioneer in the single-point mooring terminal field since 1958, having constructed and installed more than 60 terminals around the world. With its world headquarters located in Los Angeles, Calif., IMODCO also maintains a London, England, office to serve the European and Middle East area.

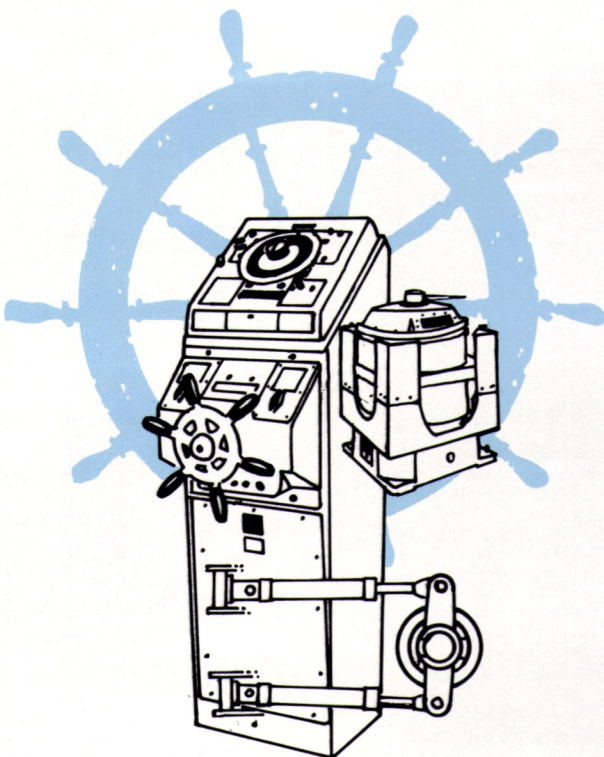
**Apollo Chemical Names
J. Richard Relick VP**

J. Richard Relick has been named vice president of operations for Apollo Chemical Corp. The announcement was made by Dr. Ira Kukin, president of the company.

Mr. Relick has had over 20 years' experience in corporate planning, management and overseas marketing. Prior to joining Apollo, he was director of Ventron International, Brussels, Belgium, where he managed the firm's overseas operations. He also has served as president of the Malrex Chemical Company, Malden, Mass.

He is a graduate of Dickinson College and Northeastern University. He is a member of the American Chamber of Commerce, the American Businessmen's Club of Brussels, the Technical Association of the Pulp and Paper Industry, the American Association of Industrial Colorists and Chemists, and the Society of Plastic Engineers.

Apollo Chemical Corp., headquartered in Whippany, N.J., is one of the leading suppliers of chemical treatment programs to industry, with offices throughout the world.



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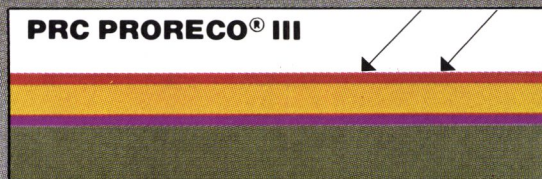
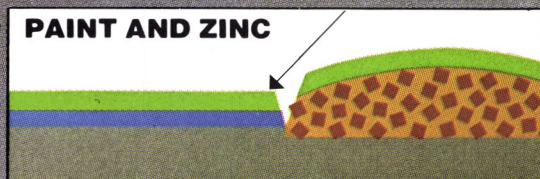


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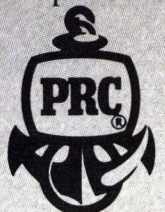
and a flexible non-skid for crew safety.

PRC products have a proven track record in the most demanding high-wear conditions. Decks coated with PRORECO® III have seen years of heavy abuse with absolutely no repairs.

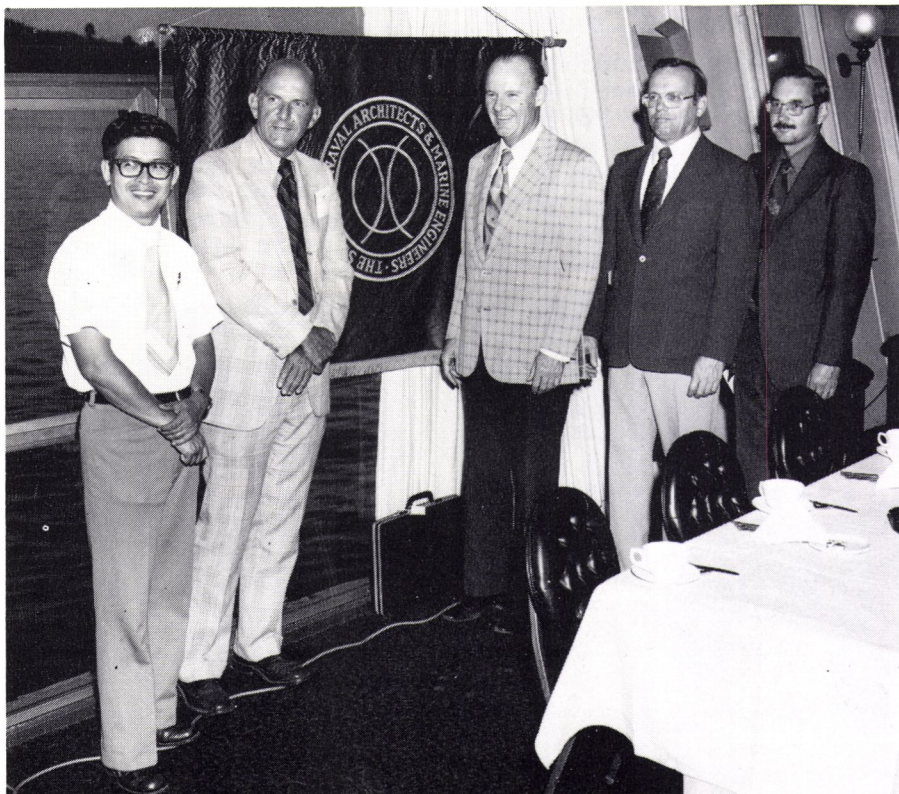
Whether you operate towboats, crew or supply boats, offshore drilling platforms, or the largest commercial vessels, you will find that PRC deck coatings pay for themselves many times over.

For information, call your nearest PRC representative or write to Rodney N. Morris, Marine Products Manager, PRC, 5454 San Fernando Road, Glendale, Calif. 91203.

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Los Angeles Section's Opening Meeting



At the September meeting of the Los Angeles Metropolitan Section, held aboard the Princess Louise in Los Angeles Harbor, from left: Dr. Kenneth Chen, Papers chairman; M.R. Ward, author/speaker; Frank A. Kuntz, chairman; William A. Hood, vice chairman, and Lt. Comdr. R.J. Kinnear, USN, secretary-treasurer.

Frank Kuntz introduced the new officers of the Los Angeles Metropolitan Section of The Society of Naval Architects and Marine Engineers at their opening meeting for the new season. He takes his place with them as Chairman of the Section. William A. Hood becomes the new vice chairman, and Lt. Comdr. Richard J. Kinnear, USN, secretary-treasurer. The new Papers chairman is Dr. Kenneth K. Chen.

The paper was presented by M.R. Ward on the subject "A Mathematically Correct Procedure

for Fairing and Defining Ship's Lines." Mr. Ward is the president of RTL, Inc., an architectural engineering and planning firm. Its corporate office is located in Gardena, Calif. His paper described a fairing procedure to define a hull surface and permit modification of a local area without affecting already corrected areas adjacent to it. "The method is an easy one to use," Mr. Ward said, "and requires only moderate computer capability, even for the largest hulls."

The procedure he recommended

is based on the use of cubic equations. It is a localized one consisting of modifying ordinates and slopes in two orthogonal directions at each data point. A number of computer programs have been written in FORTRAN IV by the firm's specialists to apply the fairing method outlined in the paper. The longest one, including subroutines, contains about 1,500 statements. The computer running time is about one minute per frame, plus 10 minutes for an initial fairing. The program has been run for several hull types, including a large fishing vessel, a mariner type hull and a chine hull offshore supply ship. The results are printed out to six significant places and checked numerically for compliance with the fairness criteria specified.

During the question and answer period later, the discussion livened up considerably. Relieved of the formality of his presentation, Mr. Ward became quite open and warm in his exchanges with the members. He repeatedly referred to several successful contracts completed by his firm to assure his listeners of the reliability of the program. He reminded them the method requires only moderate computer capability, even for the largest hulls, and can be incorporated into almost any ship lofting system.

The appendices to his paper contain much of the background information he used in his slide presentation. It includes the body plans of the ship designs discussed, pages of sampled printer readout, a bibliography, and several pages of formulas delineating the basic concepts. The paper itself discusses the mathematical premises for the procedure and

illustrates the steps for establishing the fairness criteria.

It was a meeting fairly well attended, considering the highly specialized subject matter and the rather technical treatment of it. The enthusiastic questioning of the speaker afterward certainly indicated the members' appreciation of his handling of it.

Mon River Towing Names Richard Nissley VP And General Manager

Mon River Towing, Inc. of Belle Vernon, Pa., has named **Richard B. Nissley** as vice president and general manager.

Mr. Nissley has an extensive background of education and experience in engineering and administration. He is a graduate of the University of Michigan with degrees in naval architecture and marine engineering, and has done graduate work in law and transportation. Prior to joining Mon River Towing, he was employed by Ohio Barge Line, Inc., as general manager and administrative assistant to the vice president, and before that by Dravo Corporation as principal marine engineer.

Mr. Nissley is a registered professional engineer, a member of The Society of Naval Architects and Marine Engineers, and serves in the United States Army Reserve in the grade of colonel, Corps of Engineers.

Mon River Towing, Inc. is a fully integrated contract carrier providing a wide range of specialized and general bulk commodity transportation. This service covers the Ohio, Monongahela, and Allegheny Rivers for the movement principally of coal, gasoline and fuel oil.

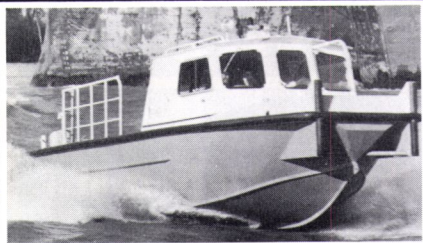


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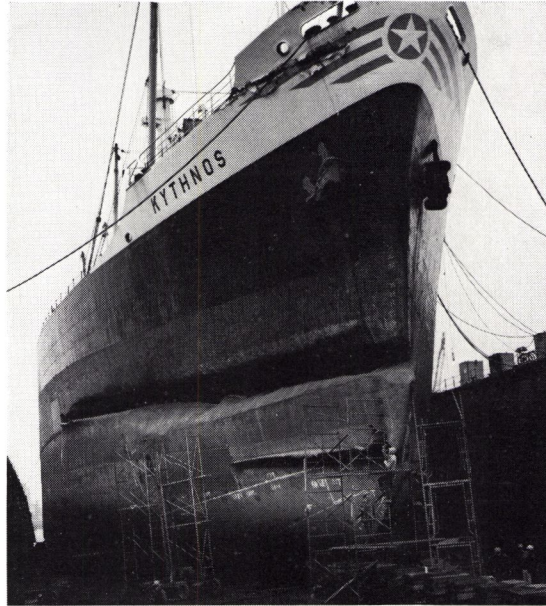
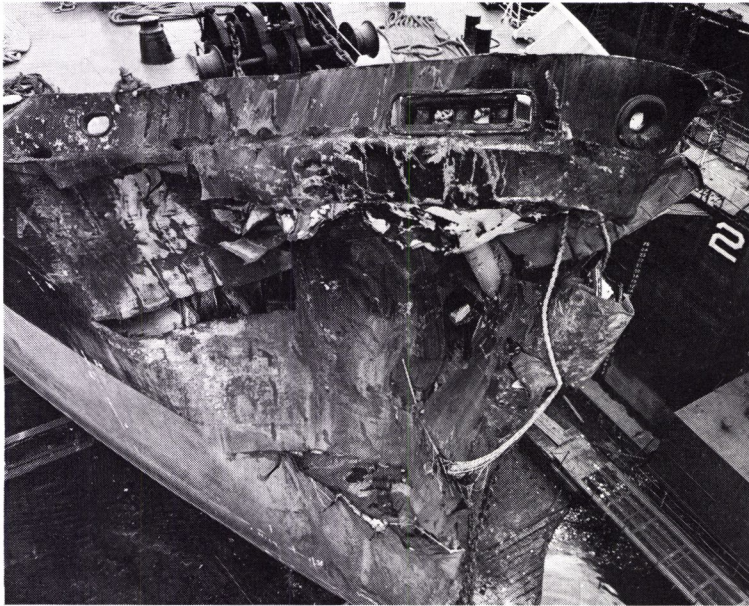
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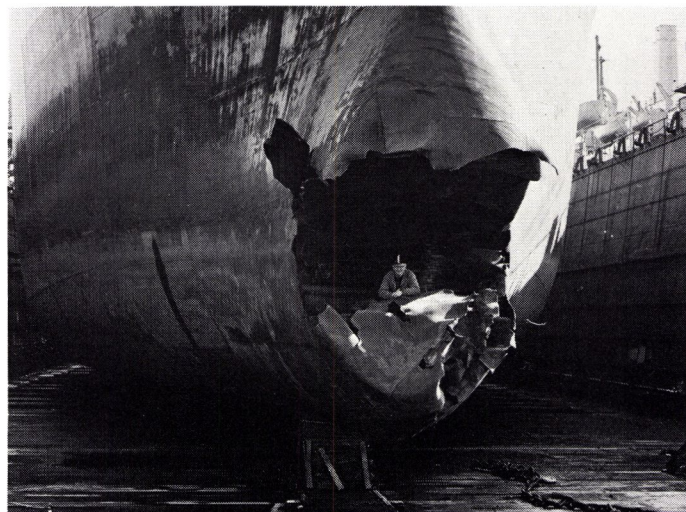
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ALCO Brochure Reports Engine Performance On Residual Fuel

A 17-page, four-color brochure reports on the testing program of an ALCO 16-cylinder POWER BOSS engine running on 400 SR1 blended residual fuel.

In this newly announced publication (HF 977-3M) there is discussion of ALCO's experience

with residual fuels in both current and older model engines; reasons for this test; basic considerations of the test; test engine build components; fuel used during the test; lube oil used during the test; test program; inspections during the test; special loads and tests; final inspection; lubricating oil; maintenance and conclusions.

Documented with four-color photographs of various compo-

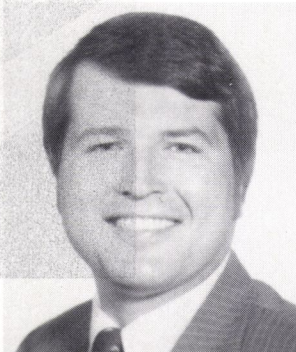
nents taken during certain phases of the performance test program, the brochure also includes laboratory heavy fuel system piping schematic; turbocharger water wash schematic and various charts and graphs concerned with the program.

Conclusions reached were very gratifying in proving the ALCO POWER BOSS engine's ability to operate on blended residual fuel. Objectives were met with re-

spect to both engine performance and endurance. The Model 251 POWER BOSS operating on a blended residual fuel can be expected to provide dependable service in customer applications while taking advantage of the reduced cost of these fuels.

For a free copy of this ALCO brochure (HF 977-3M), write to **Edward T. Mosley**, Alco Power Inc., 100 Orchard Street, Auburn, N.Y. 13021.

American Arabian Partnership Names John S. Hollett



John S. Hollett

John S. Hollett has just recently become marketing director of Saudi Arabia Transport Organisation Ltd. (SATOL). SATOL is a partnership between Global Transport Organisation (GTO) of San Francisco, Calif., and the Yusuf bin Ahmed Kanoo Organisation of Saudi Arabia. GTO is made up of Crowley Maritime Corporation of San Francisco, Genstar Ltd. of Montreal, Canada, and Federal Commerce and Navigation of Montreal.

SATOL has over \$60,000,000 in marine and land transportation assets in Saudi Arabia, and has a long-term exclusive lighterage and heavy-haul contract with ARAMCO for all cargo coming into the Arabian Gulf.

Mr. Hollett will be responsible for a marketing staff that will cover the entire Arabian Gulf area. The expertise of SATOL is offshore handling and lighterage, port congestion clearance, heavy lifts, module transport, heavy haul and general trucking throughout the Kingdom.

SATOL's affiliated company, GTO, has expertise in ocean towing, barging of prefabricated housing, worldwide drilling rig movements, and dredge movements.

Mr. Hollett has recently been the manager of marketing for Global Marine Development Inc. of Newport Beach, Calif., the designer and the operator of the Glomar Explorer. Mr. Hollett has his B.S.E. degree in naval architecture and his M.B.A. degree in marketing from the University of Michigan. His address in Saudi Arabia is SATOL, c/o ARAMCO, P.O. Box 1947, Dhahran, Saudi Arabia.

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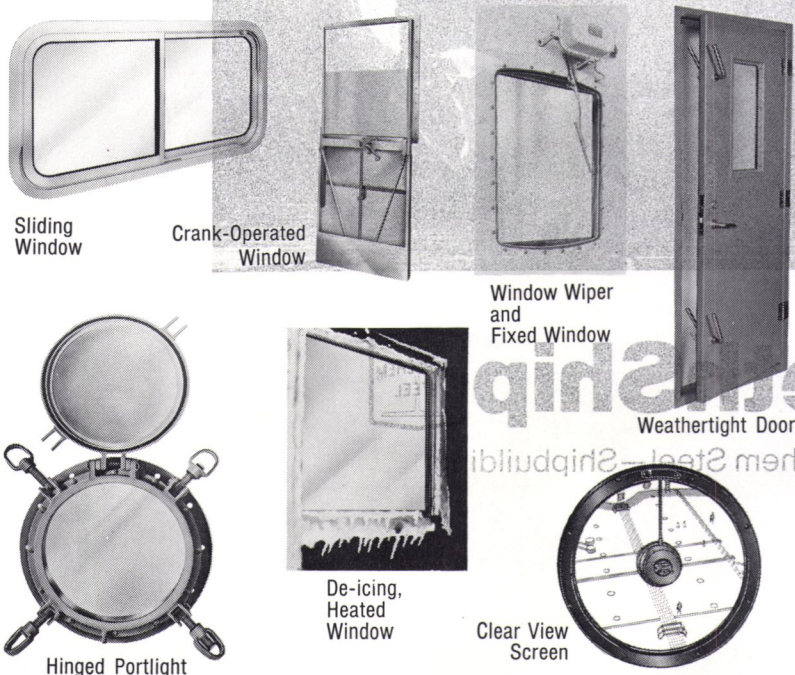
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Nicholas Liberatore To Head International Activities For Genstar

Genstar Limited, One Place Ville Marie, Montreal H3B 3R1, Canada, has announced the appointment of **Nicholas A. Liberatore** as executive vice president to head up all international activities outside of Canada and the

United States. Mr. Liberatore will also be responsible for Canadian domestic marine operations.

Genstar Limited is a diversified operating company which manufactures cement, building materials, chemicals and fertilizers, and is engaged in housing, land development, commercial property development and management, construction, tug and barge transportation, shipbuilding

and ship repairs, import-export of industrial minerals, and venture capital investment.

Genstar recently began work on a feasibility study for a \$250-million resort complex to be built for the Kingdom of Jordan. International marine activities include partnerships in Global Transport Organization and Union Towing and Transportation Company. The company's domestic marine oper-

ation, Genstar Marine Limited, includes Seaspan International, Vancouver Shipyards, and a partnership in Arctic Transportation.

Mr. Liberatore has had over 25 years of experience in international operations in the construction, cement and energy businesses. He has been responsible for the construction of U.S. naval and air installations in Spain, and has recently served with a major international engineering organization with responsibility for domestic and international marketing and corporate planning. For 10 years, Mr. Liberatore has had full responsibility for the international operations of Lone Star Industries in Latin America, Spain, and other areas of the world. Previously, he was a vice president of a major U.S. construction company, Raymond International Inc., where he was responsible for heavy construction overseas activities. He has also been responsible for establishing joint ventures, the planning of new investments and acquisitions and the financing of international operations.

ODECO Elects

**Dr. Terry D. Petty VP
Design And Engineering**



Dr. Terry D. Petty

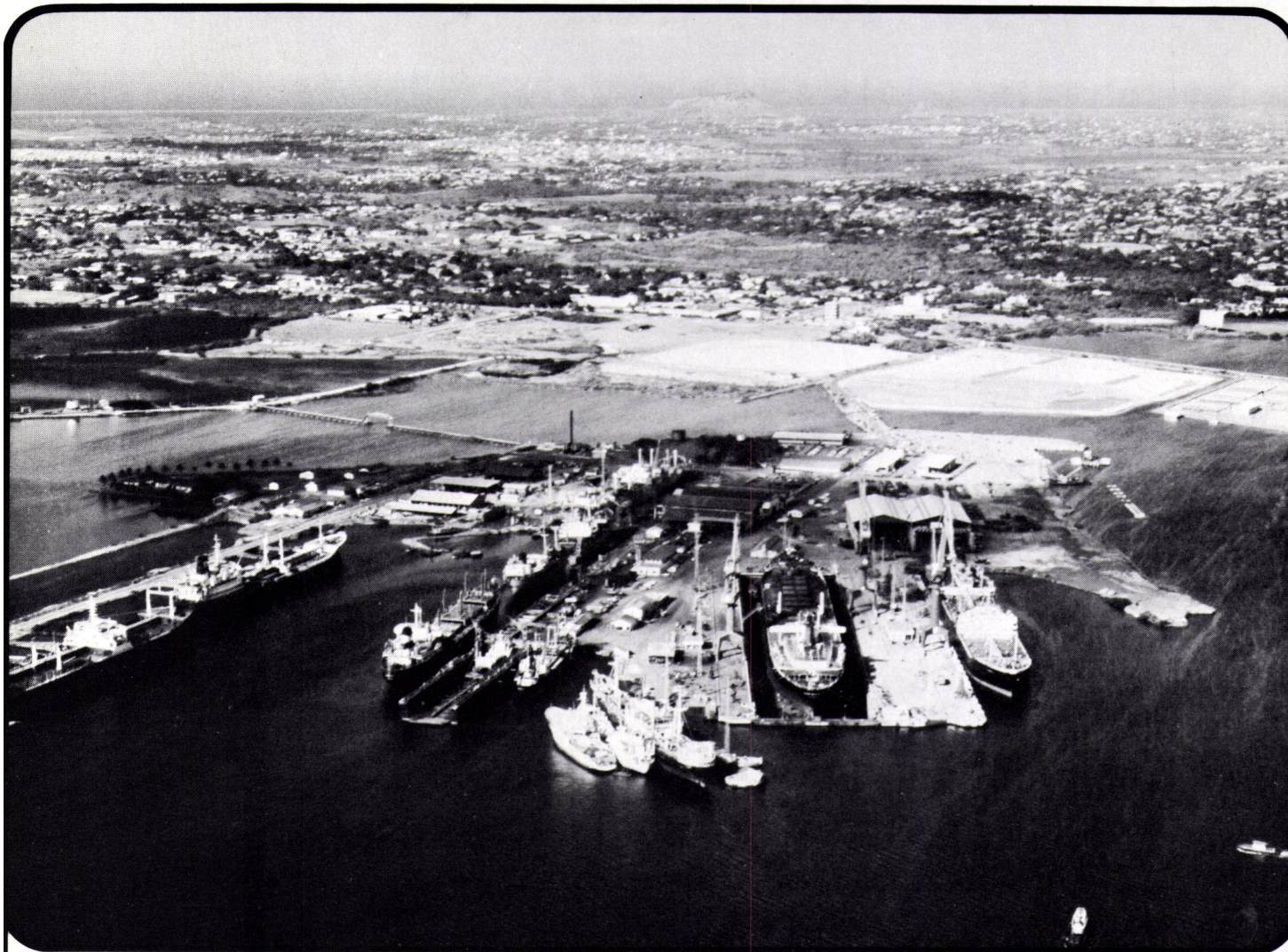
Dr. Terry D. Petty, a veteran of more than two decades in the oil exploration industry, has been elected vice president-design and engineering of Ocean Drilling & Exploration Company of New Orleans, La., by the ODECO board of directors.

A native of Paducah, Texas, Dr. Petty began his career in the petroleum industry as a roughneck for Choya Drilling Co. and Humble Oil & Refining Co. from 1953 until 1960, when he entered the University of Oklahoma.

After receiving a Bachelor of Science degree in petroleum engineering in 1965, Dr. Petty became an operations supervisor for Esso Exploration, Inc. He returned to the University of Oklahoma and earned a Master of Science degree in petroleum engineering in 1970.

Dr. Petty joined ODECO in 1971 as manager of the New Rig Construction Division, and in 1974 was named president of ODECO Engineers Inc., a wholly owned subsidiary of ODECO.

He received his Doctor of Engineering degree from the University of Oklahoma in 1975.



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Matson Navigation Names Michael Wasacz

Michael S. Wasacz, a Matson Navigation Company vice president, has been appointed assistant area manager-Hawaii, it was announced by R.J. Pfeiffer, president.

Mr. Wasacz, in his new duties as vice president, assistant area manager-Hawaii, will report to James L. Reid, senior vice president, area manager-Hawaii.

Mr. Wasacz, who recently completed a six-week executive program in business administration at Columbia University, formerly served as vice president, area manager-southern California, and before that was area manager-northern California.

He started with Matson in 1959 in New York, and later held managerial posts in San Francisco, Portland, Seattle and Los Angeles. He became a vice president in 1976, following a year's special assignment with Matson Terminals, Inc., a Matson subsidiary.

ABS Classes 127 New Vessels In September

The American Bureau of Shipping (ABS) classed 127 new vessels worldwide in September. The vessels totaled 1,705,864 deadweight tons, or 940,520 gross tons, and included 13 bulk carriers, four very large crude carriers (VLCCs), one roll-on/roll-off vehicle carrier, and two tugboats designed to operate as part of two rigidly integrated tug-barge units.

The bulk carriers, all built in Japan, range in size from the 14,924-dwt, twin-screw Tarpon, built by Hitachi Shipbuilding & Engineering Co., Ltd., Mukai-shima, for Lib-Ore Steamship Company, Inc., Monrovia, Liberia, to the 36,360-dwt Rimba Sepetir, built by Osaka Shipbuilding Co., Ltd., Osaka, for Malaysia International Shipping Corp., Berhad, Kuala Lumpur.

The largest VLCC classed was the David Packard of 406,592 dwt, owned by Chevron Transport Corp., Monrovia, and built by Mitsubishi Heavy Industries, Ltd., Nagasaki, Japan. Other VLCCs classed were the 250,621-dwt Italian-flag Agip Abruzzo, built by Italcantieri, S.p.A., Monfalcone, for SNAM, S.p.A., Milan; and the 153,843-dwt Arco Mariner and 153,829-dwt Arco Discovery, both built by Mitsubishi Heavy Industries, Ltd., Nagasaki, for Sequoia Marine Corporation, Monrovia.

All four VLCCs classed are fitted with an inert gas system and incorporate various grades of higher strength steel in their construction.

The roll-on/roll-off carrier classed is the Westward Venture, a three-deck vessel built by Sun Shipbuilding & Dry Dock Co., Chester, Pa., for 675 Leasing Co., Wilmington, Del. The ship

can carry 395 trailers and 66 automobiles.

Classed in September was the twin-screw Seabulk Magnachem, a catamaran tugboat designed to operate as part of a rigidly integrated tug-barge unit. The 116-foot-long tug, with a diesel drive totaling 14,000 bhp, propels a 582-foot-long barge by fitting securely around the stern of the barge. The unit is held rigidly in place by a system of hydraulically op-

erated wedges. The United States-flag tug was built by Kelso Marine, Inc., Galveston, Texas, for Central National Bank of Cleveland as Trustee, Cleveland, Ohio.

Also classed, and designed as part of a rigidly integrated tug-barge unit, was the twin-screw Valerie F, built by Southern Shipbuilding Corp., Slidell, La., for Intercoastal Bulk Carriers, Inc., San Francisco, Calif. This 151-foot-long tug, with a diesel drive

totaling 16,000 bhp, is secured by means of a system of hydraulically operated wedges and jacks into the stern notch of a 620-foot-long barge.

The American Bureau of Shipping is a nongovernmental, worldwide ship classification society which establishes internationally accepted standards, called Rules, for the design, construction, and periodic survey of merchant vessels and other marine structures.

Introducing The Magnificent Magnavox Marisat Terminal

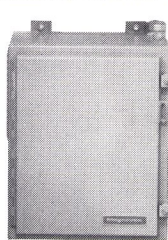
This new shipboard communications terminal puts you in instant, private and remarkably clear two-way telephone or telex contact with your ship anywhere, at any time, in the Atlantic or Pacific Oceans.

Simple

For telex, just start typing. All functions are controlled through instructions to the microprocessor via the teleprinter. For voice calls, a single push button establishes contact with the operator for calls anywhere in the world.

Space Saver

The space saving Magnavox MX 111 terminal needs space in the radio room for only the telephone and the desktop teleprinter. The compact power supply and electronics unit are bulkhead-mounted and can be tucked away almost anywhere.

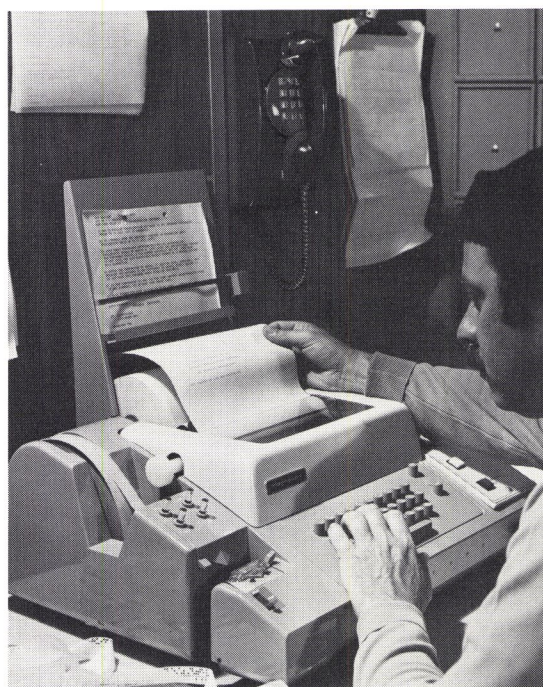


Modular Flexibility

System changes, options, expansions and provisions for future satellites are easily accomplished because the system is designed with future changes in mind.

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Telex messages, and all system operations, annotated with GMT, are



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Easy To Install

The MX 111 is extremely rugged incorporating large design margins based upon years of Magnavox marine experience. Extensive factory burn in is performed to assure reliable operation on board your ship.

Reliable

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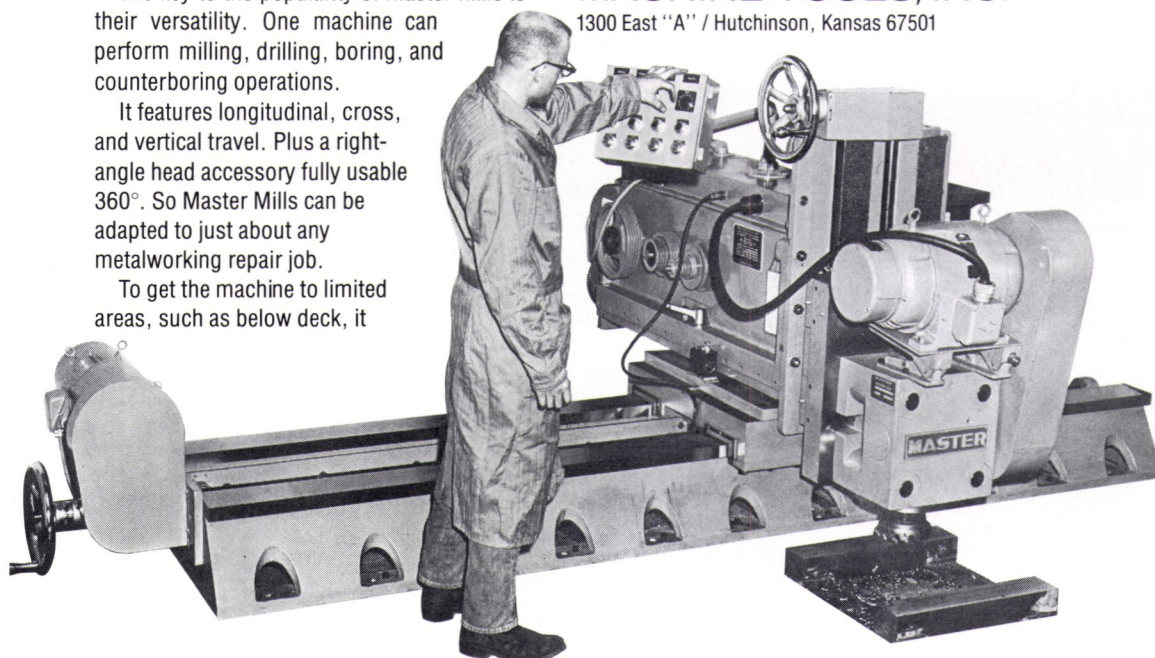
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Belle River Sets Tonnage Record On Great Lakes

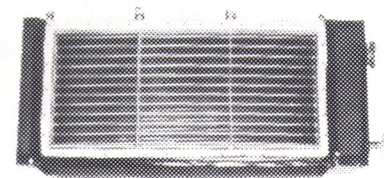
The largest single cargo ever moved on the Great Lakes was delivered in September to Detroit Edison by the motor vessel Belle River.

The record load, 65,760 tons of low-sulfur western coal, was reported by the vessel's owners, American Steamship Company, a subsidiary of GATX Corporation.

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Built by the Bay Shipbuilding Corporation at Sturgeon Bay, Wis., the Belle River carries coal from Superior, Wis., to Detroit Edison's St. Clair, Mich., powerplant.

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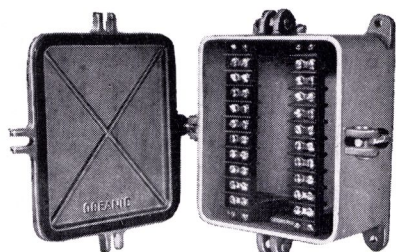
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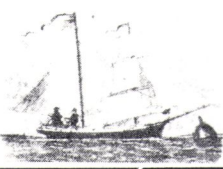


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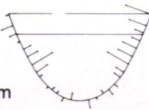
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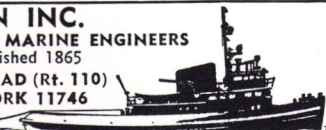
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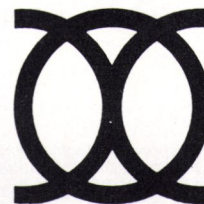
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Congressman Mario Biaggi Will Address First N.Y.C. Diving-Insurance Symposium

An unprecedented two-day New York symposium designed to provide a common international forum for diving and insurance industry views will be addressed by Congressman Mario Biaggi (D-N.Y.) on November 15, 1977, at the Statler Hilton Hotel, New York City.

The 1977 International Diving and Insurance Symposium, scheduled for November 14-15, 1977 at the Statler Hilton, will focus on technical developments affecting diving safety standards and insurance rates within the American diving industry.

The Symposium, sponsored by the Maritime Association of the Port of New York, the Marine Technology Society, and the Association of Diving Contractors, will feature talks by prominent government and industry authorities on such diverse topics as: The Law as it Relates to Divers (from both a plaintiff and defense attorney's point of view); Diving Contracts and the Insurance Problem; Safety for the Diver—Now and In the Future; and Diving Industry and Insurance Problems From an American and European Point of View.

Congressman Biaggi, chairman of the Coast Guard and Navigation Subcommittee, House Merchant Marine and Fisheries Committee, will be honored guest and luncheon speaker on November 15, following panel discussions on "What Must Be Done to Reduce Insurance Claims and Improve the Diving Industry Image in the Insurance Market," from both the insurance and diving industry standpoints.

Registration fees for the Symposium are \$200 per person, and provide for attendance

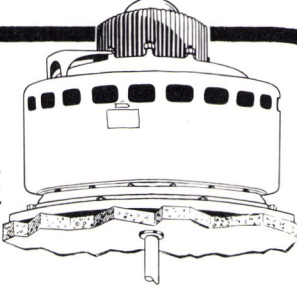
at all symposium sessions, luncheons, cocktails, coffee and danish breaks, and a printed copy of all Symposium proceedings.

For registration forms, programs, or additional information, contact the Maritime Association of New York, 80 Broad Street, New York, N.Y. 10004, telephone (212) 425-5704.

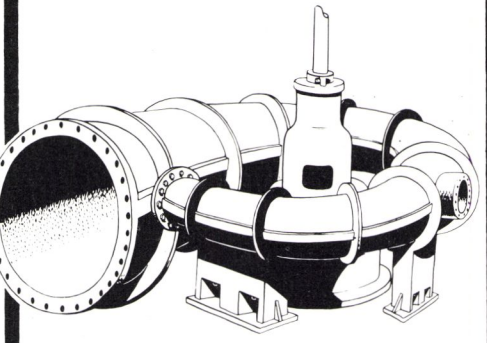
Grain Company Plans To Build Ten 200-Foot Covered Barges

The Maritime Administration has disclosed an application for financing aid from Oklahoma-Kansas Grain Corp., Catoosa, Okla., to cover the construction of "10 or more" 200-foot covered hopper barges to haul grain, fertilizer, and alfalfa pellets on inland waterways. The company estimated the mortgage loan it expected to take out would be about \$2 million. The company operates five other barges.

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Miles G. O'Harra

Miles G. O'Harra, recently retired from Bailey Meter Co., will enter the consulting field as a Marine and Industrial Steam Control Systems Consultant at 9355 Milford Lane, Mentor, Ohio 44060.

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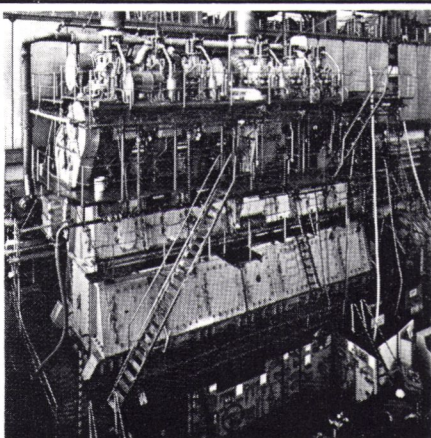
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Congressman Mario Biaggi Will Address First N.Y.C. Diving-Insurance Symposium

An unprecedented two-day New York symposium designed to provide a common international forum for diving and insurance industry views will be addressed by Congressman **Mario Biaggi** (D-N.Y.) on November 15, 1977, at the Statler Hilton Hotel, New York City.

The 1977 International Diving and Insurance Symposium, scheduled for November 14-15, 1977 at the Statler Hilton, will focus on technical developments affecting diving safety standards and insurance rates within the American diving industry.

The Symposium, sponsored by the Maritime Association of the Port of New York, the Marine Technology Society, and the Association of Diving Contractors, will feature talks by prominent government and industry authorities on such diverse topics as: The Law as it Relates to Divers (from both a plaintiff and defense attorney's point of view); Diving Contracts and the Insurance Problem; Safety for the Diver—Now and In the Future; and Diving Industry and Insurance Problems From an American and European Point of View.

Congressman **Biaggi**, chairman of the Coast Guard and Navigation Subcommittee, House Merchant Marine and Fisheries Committee, will be honored guest and luncheon speaker on November 15, following panel discussions on "What Must Be Done to Reduce Insurance Claims and Improve the Diving Industry Image in the Insurance Market," from both the insurance and diving industry standpoints.

Registration fees for the Symposium are \$200 per person, and provide for attendance

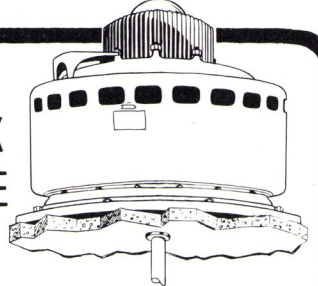
at all symposium sessions, luncheons, cocktails, coffee and danish breaks, and a printed copy of all Symposium proceedings.

For registration forms, programs, or additional information, contact the Maritime Association of New York, 80 Broad Street, New York, N.Y. 10004, telephone (212) 425-5704.

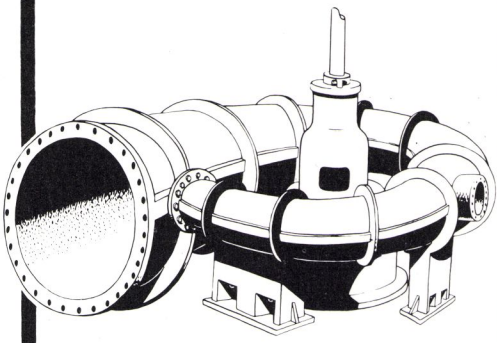
Grain Company Plans To Build Ten 200-Foot Covered Barges

The Maritime Administration has disclosed an application for financing aid from Oklahoma-Kansas Grain Corp., Catoosa, Okla., to cover the construction of "10 or more" 200-foot covered hopper barges to haul grain, fertilizer, and alfalfa pellets on inland waterways. The company estimated the mortgage loan it expected to take out would be about \$2 million. The company operates five other barges.

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Miles O'Harra Enters The Consulting Field



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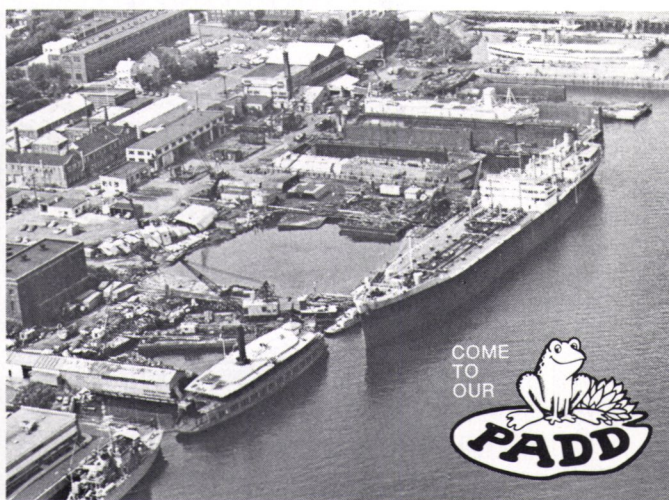
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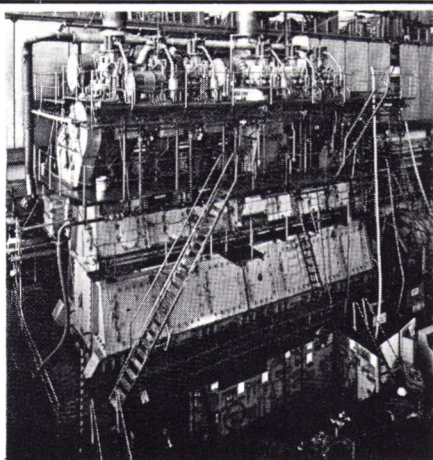
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Clean Venture, Inc. Formed By Spill Contractors To Cover Entire New York Harbor Area

A new emergency oil spill control organization for the Port of New York has been formed at Perth Amboy, N.J.

The company, Clean Venture, Inc., will provide quick-strike coverage of the entire harbor from bases in New York and New Jersey for oil spills of any size.



Principals of Clean Venture, Inc., left to right: **William H. Hawley**, president, Sealand Environmental Engineering, Inc.; **James H. Parker**, president, Industrial Marine Service, Inc.; and **Robert H. Dee Jr.**, president, Jet Line Services, Inc.

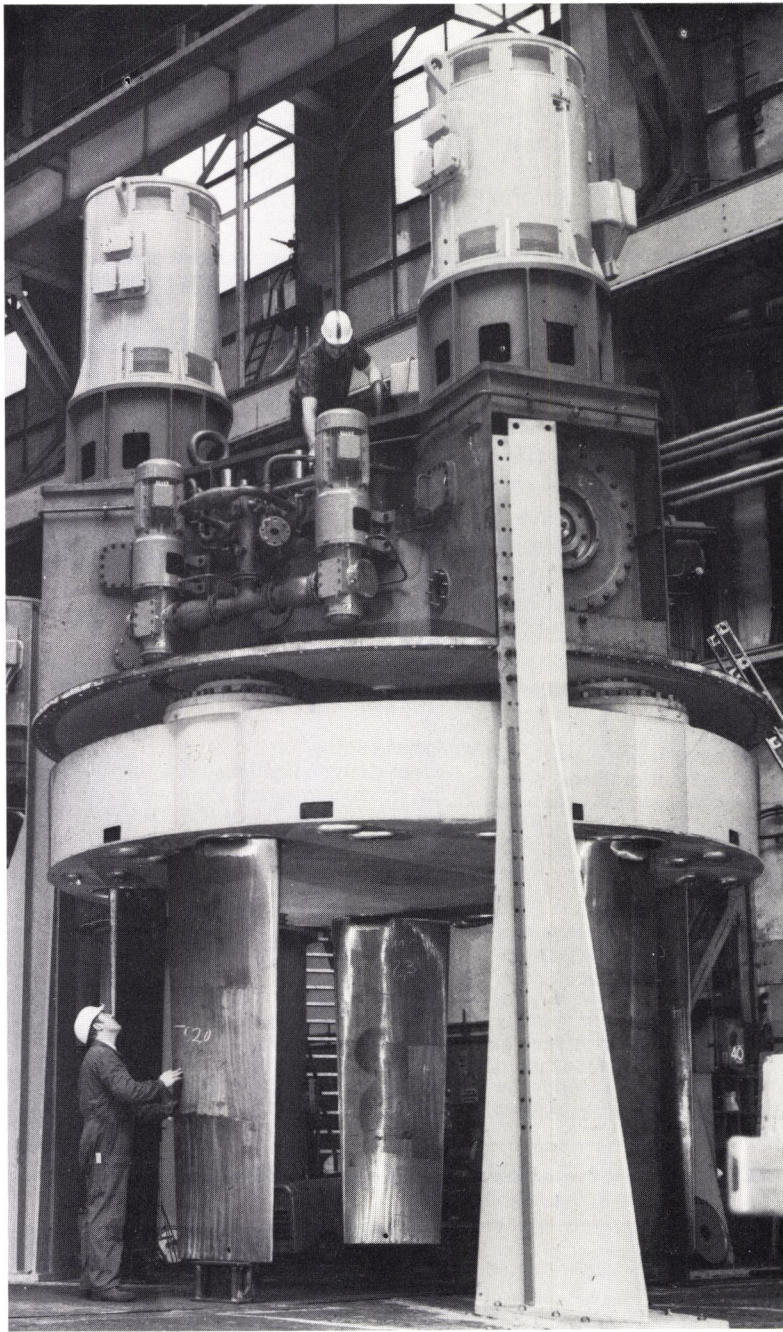
This first-of-a-kind effort represents a commitment by a group of established spill contractors from other areas of the country to provide the harbor with the special kind of services it needs as the largest petroleum-handling port in the nation.

John J. Gallagher, a veteran of many of the major marine-related spills in the harbor and the executive director of Clean Venture, designed the company's operations to implement a comprehensive port-wide spill control system previously devised by the founding companies. **Gary E. Wagner**, formerly operations manager for Jet Line Services of Boston, Mass., will head up Clean Venture as vice president and general manager.

The companies forming Clean Venture are Sealand Environmental Engineering, Inc. of Milford, Conn., Industrial Marine Service, Inc. of Norfolk, Va., and Jet Line Services, Inc. of Boston. They will join with Reynolds Shipyard Corporation on Staten Island, N.Y., to provide a considerable reservoir of experienced men, equipment and facilities for the Port of New York.

The new company, with a prime capability in emergency spill control work, will also provide services in the areas of tank cleaning and tank farm maintenance, pollution control systems design, installation and maintenance, as well as liquid waste handling and disposal for the petroleum-related and marine industries throughout the port.

"Primary bases for the operation have been established at the Raritan Center Industrial Park near Perth Amboy, and at the Reynolds Shipyard on Staten Island," Mr. **Wagner** said. "The Perth Amboy location houses our company's land-based equipment, routine maintenance facilities and our administrative offices, while the Staten Island operation at Stapleton Anchorage houses our major water-based equipment. Slated for delivery last month is the first privately owned major skimming vessel in the East, the Bennett Class 6E skimmer. This 40-foot LOA vessel will be stationed at Reynolds, but can be rapidly transported to other points in the harbor where it may be needed."



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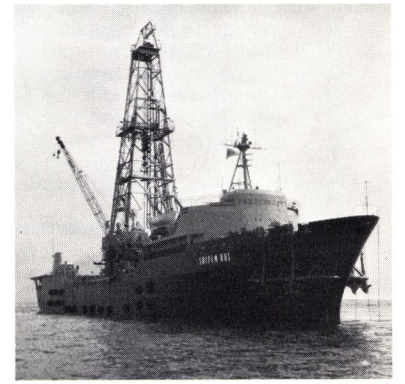


Fig. 1) Complete propulsion unit, consisting of Voith-Schneider Propeller with three vertically arranged electric motors, for an input power of about 2,200 kW (3,000 hp) blade orbit diameter 4,000 mm blade length 2,500 mm Detailed information upon request.

Fig. 2) Italian drillship "Saipem Due", equipped with Voith-Schneider Propellers, 4 m blade orbit dia. For dynamic positioning the Voith-Schneider Propellers are computer-controlled by signals from a sonar system.

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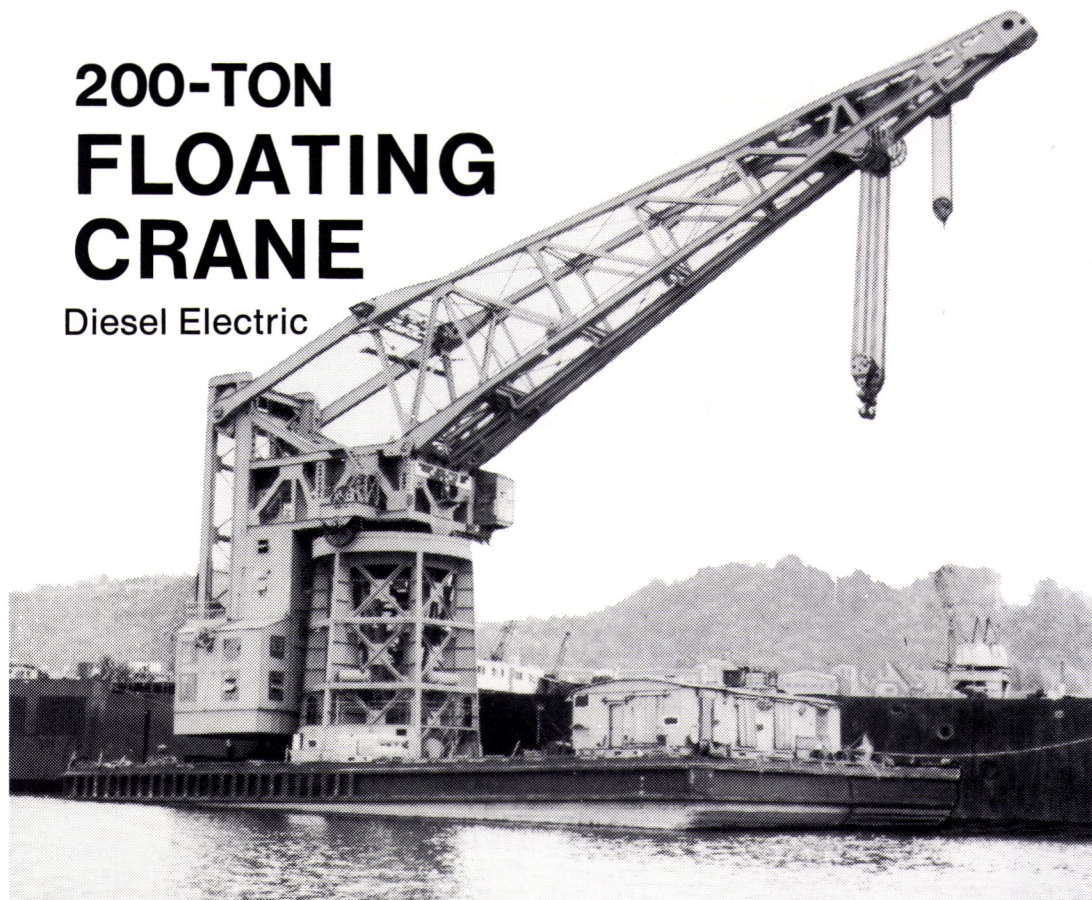
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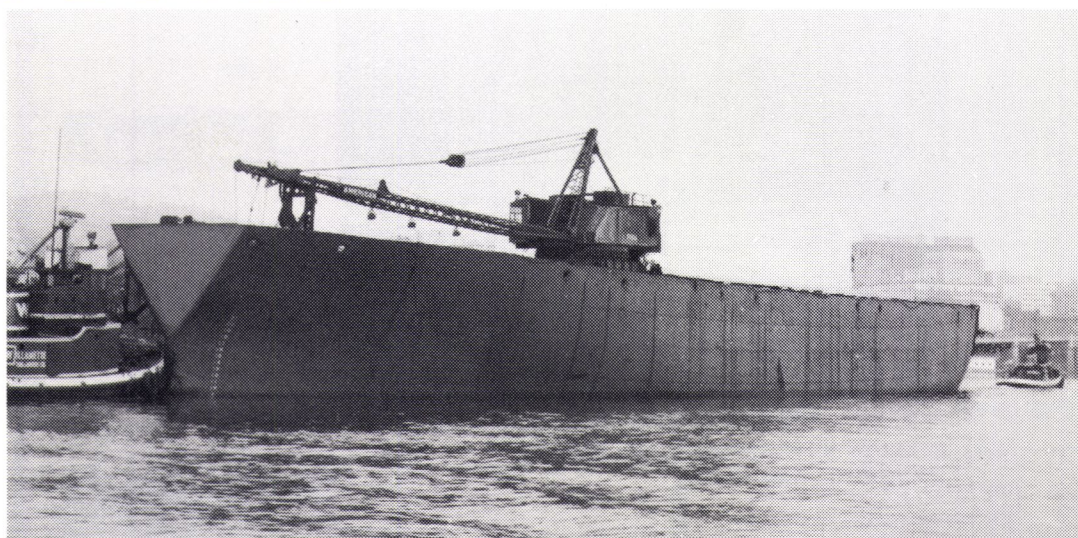
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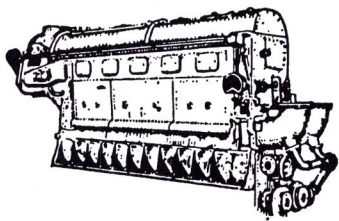
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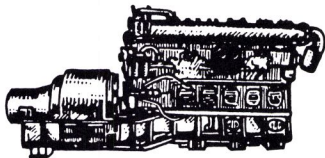
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A. C.

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

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D. C.

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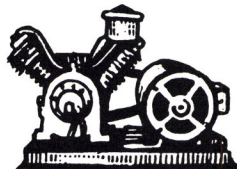
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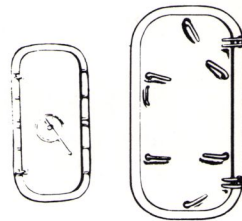
3—INGERSOLL - RAND, Size 5x5x4x4, 50 CFM, 150 PSI, with G.E. Motor, 20 HP, 440/3/60.

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

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

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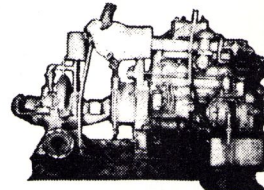
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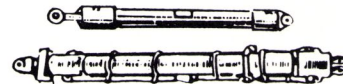
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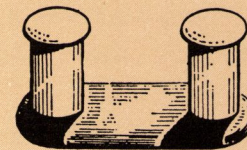
2—BUDA, Model 6-LD-468, Diesel Engines, 6 cylinders, 100 BHP, Marine, Gardner-Denver, centrifugal Pumps, Bronze, horizontally split case, 1000 GPM, 280' head, 6" suction and 5" discharge.

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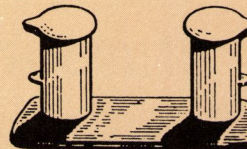


Bore	Overall Stroke	Rod Diameter	Retracted Length	Action
10"	12"	3.75"	45 1/2"	double
10"	26"	3.75"	58 1/2"	double
2"	8"	1 1/2"	20"	double
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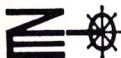
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Baylor Company, P.O. Box 36326, Houston, Texas 77036

Colt Industries, Water & Waste Management Operation, Beloit, Wisc. 53511

Demco, Inc., P.O. Box 94700, Oklahoma City, OK 73109

Eureka Chemical Co., P.O. Box 2205, So. San Francisco, CA 94080

Engelhard Industries, Chloropac Systems, 2655 U.S. Rt. 22, Union, N.J. 07083

LaMere Industries, Inc., (Marland Environmental Services and Clear Water, Inc.) 227 N. Main Street, Walworth, WI 53184

Mapco, 1437 So. Boulder Ave., Tulsa, Okla. 74119

Marine Moisture Control Co., Inc., 449 Sheridan Blvd., Inwood, L.I., N.Y. 11696

Microphor, Inc., P.O. Box 490, Willits, CA 95490

Red Fox Industries, P.O. Drawer 640, New Iberia, La. 70560

St. Louis Ship FAST Sewage Systems, 611 East Marceau St., St. Louis, Mo. 63111

Sigma Treatment Systems, 603 Dean Street, Brooklyn, N.Y. 11238

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

General Metals of Tacoma, Inc., 1902 Marine View Dr., Tacoma, Washington 98422

National Metal & Steel Corp., 691 New Dock St., Terminal Island, Cal. 90731

Zideff Explorations, Inc., 3121 S. W. Moody St., Portland, Ore. 97201

SHIP MODELS

Jas Foley & Son, 506 Seventh Street, Santa Monica, Calif. 90402

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

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

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

Conrad Industries, P.O. Box 790, Morgan City, La. 70380

Curacao Drydock Co., Inc., P.O. Box 153, Willemstad, Curacao, Netherlands Antilles

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

Halter 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, Kura-ku, Kobe, Japan

Keppel Shipyard Ltd., P.O. Box 2169, Singapore

Kockums Shipyard, S-201, 10 Malmo 1, Sweden

Lantana Boatyard, Inc., 808 N. Dixie Hwy., Lantana, Fla. 33460

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 428, 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

Moss Rosenberg Verft A.S., P.O. Box 53, 1512 Jelay/Moss/Norway

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

Navimor U.S.A., One World Trade Center, Suite 3557, New York, N.Y. 10048

Neorion Shipyards Syros, Ltd., Syros, Greece

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

Paccoco, 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

Sumitomo Heavy Industries Ltd., 2-1 Ohtemachi 2-chome, Chiyoda-ku, Tokyo, Japan

Swiftships Inc., P.O. Box 1908, Morgan City, LA 70380

Terrin Shipyards, Societe Provencale des Ateliers Terrin, 287, Chemin De La 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

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TANK CLEANING

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

Penco Division/Hudson Engineering Co., 1114 Clinton St., Hoboken, N.J. 07030

TANK LEVELING INDICATORS

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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 Towing Co., Inc., 918 World Trade Building, Houston, Texas 77002

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Terry Corporation, P.O. Box 1200, Windsor, CT 06101

UNDERWATER SERVICES

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

VACUUM LIFT SYSTEMS

DP Way Corp., 3822 West Elm Street, Milwaukee, Wisc. 53209

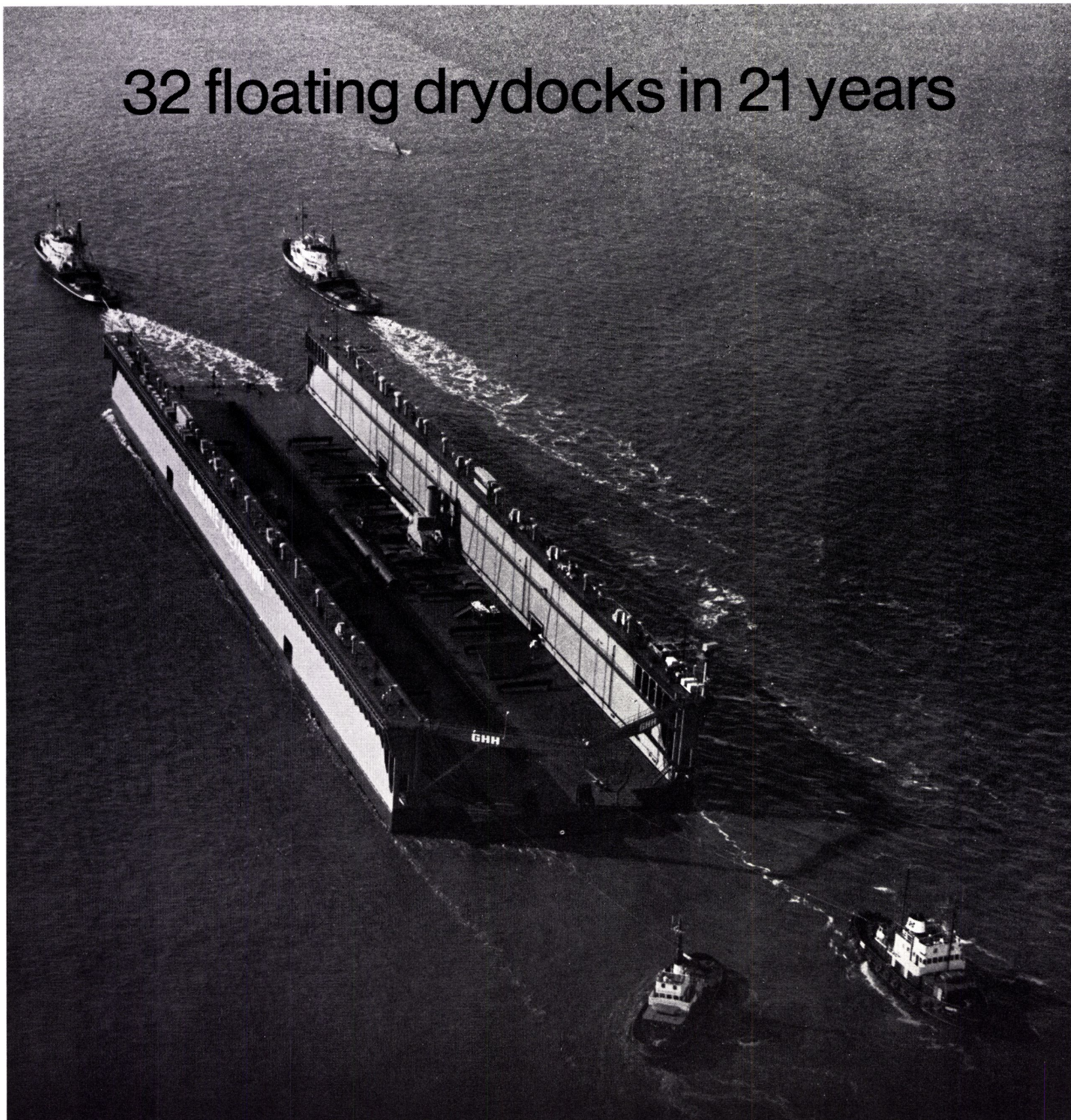
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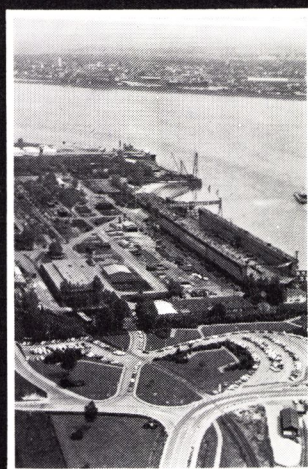
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