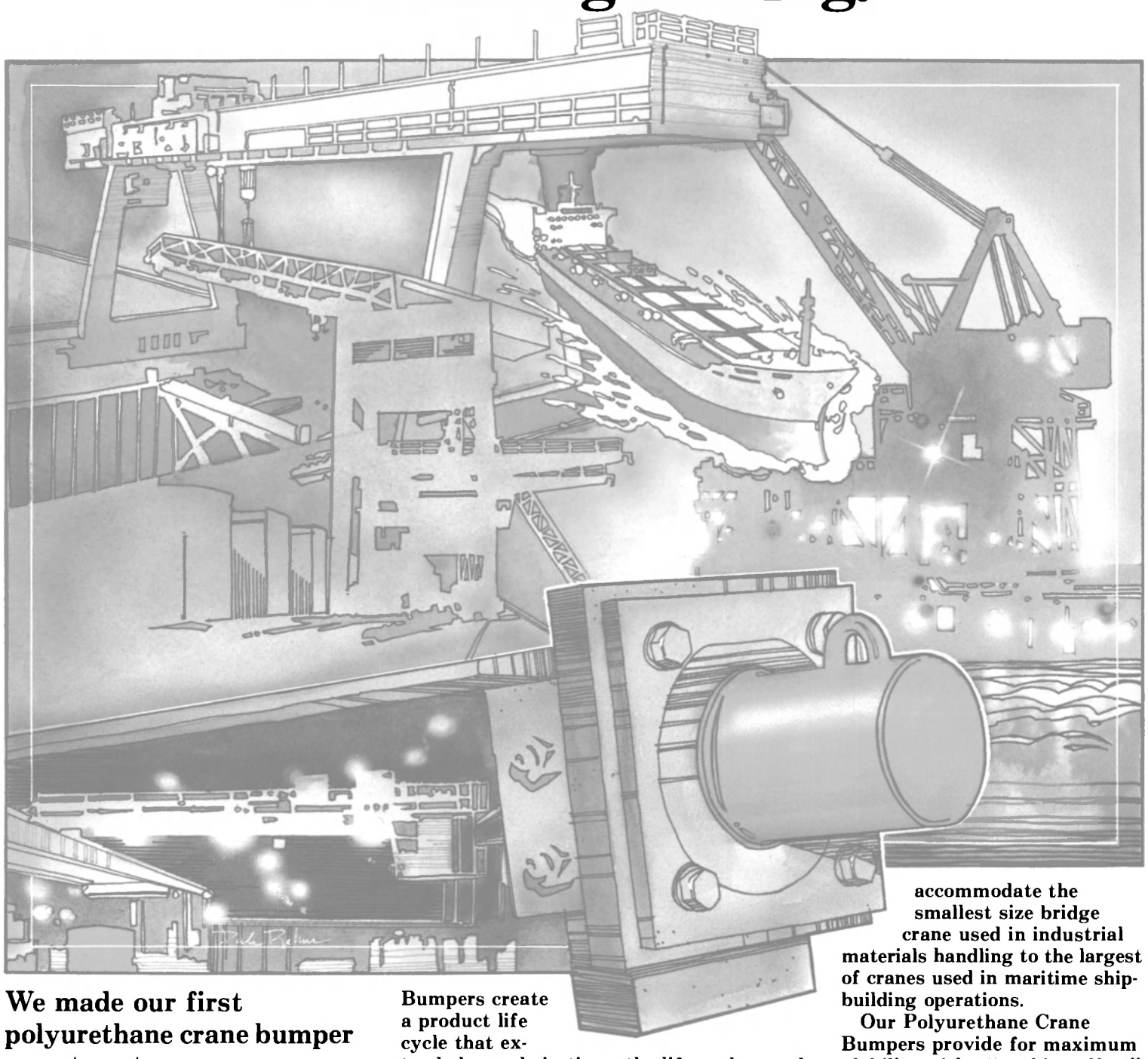
MARITIME REPORTER
AND ENGINEERING NEWS

APRIL 1985 DOUBLE ISSUE

OTC NOR-SHIPPING ASNE DAY

Kastalon® Polyurethane Crane Bumpers. Proven Engineering.



We made our first polyurethane crane bumper over twenty years ago.

Since then, our engineering and design services, our production skills and all of our manufacturing capabilities have made it possible for Kastalon® to produce the kind of crane bumpers that meet or exceed almost every demand placed upon their performance by all segments of industry.

Kastalon Polyurethane Crane Bumpers have proven advantages that include: 1) lower cost, 2) long-service life, 3) maintenance-free operation, 4) better cushion effects, 5) ability to accommodate virtually every bumper requirement.

Kastalon Crane Bumpers are made of resilient, durable polyurethane, formulated to physical properties that surpass all ordinary materials. The physical properties of Kastalon Crane Bumpers create a product life cycle that extends beyond six times the life cycle of other crane bumper materials. Our polyurethane crane bumpers are not affected by oil, water, grease, dirty environments, temperature changes, radioactive exposure or weathering. And, we can meet the specs for any regulatory requirements.

Polyurethane crane bumpers have no moving parts; eliminating malfunctions or failures. They're impervious to the destructiveness of heat and cold, water and chemical decomposition. They work effectively in temperature ranges from −50°Centigrade (−60°F) to 107°Centigrade (225°F) or even greater parameters if required.

Heavy duty Kastalon Polyurethane Crane Bumpers come in a range of sizes from 2 inch diameter up to 24 inch diameter. This range constitutes a selection in sizes and parameters to accommodate the smallest size bridge crane used in industrial materials handling to the largest of cranes used in maritime shipbuilding operations.

Our Polyurethane Crane Bumpers provide for maximum dependability with a "cushion effect" many times greater than other types of crane bumpers. They replace hydraulic, rubber, foam material, plastic, composition, wood, nonferrous metal and steel crane bumpers with superior results.

It's time you switched to Kastalon Polyurethane Crane Bumpers for real cost savings and optimum performance. For complete information on crane bumpers or other Kastalon customized polyurethane product services, call or write Kastalon, Inc.

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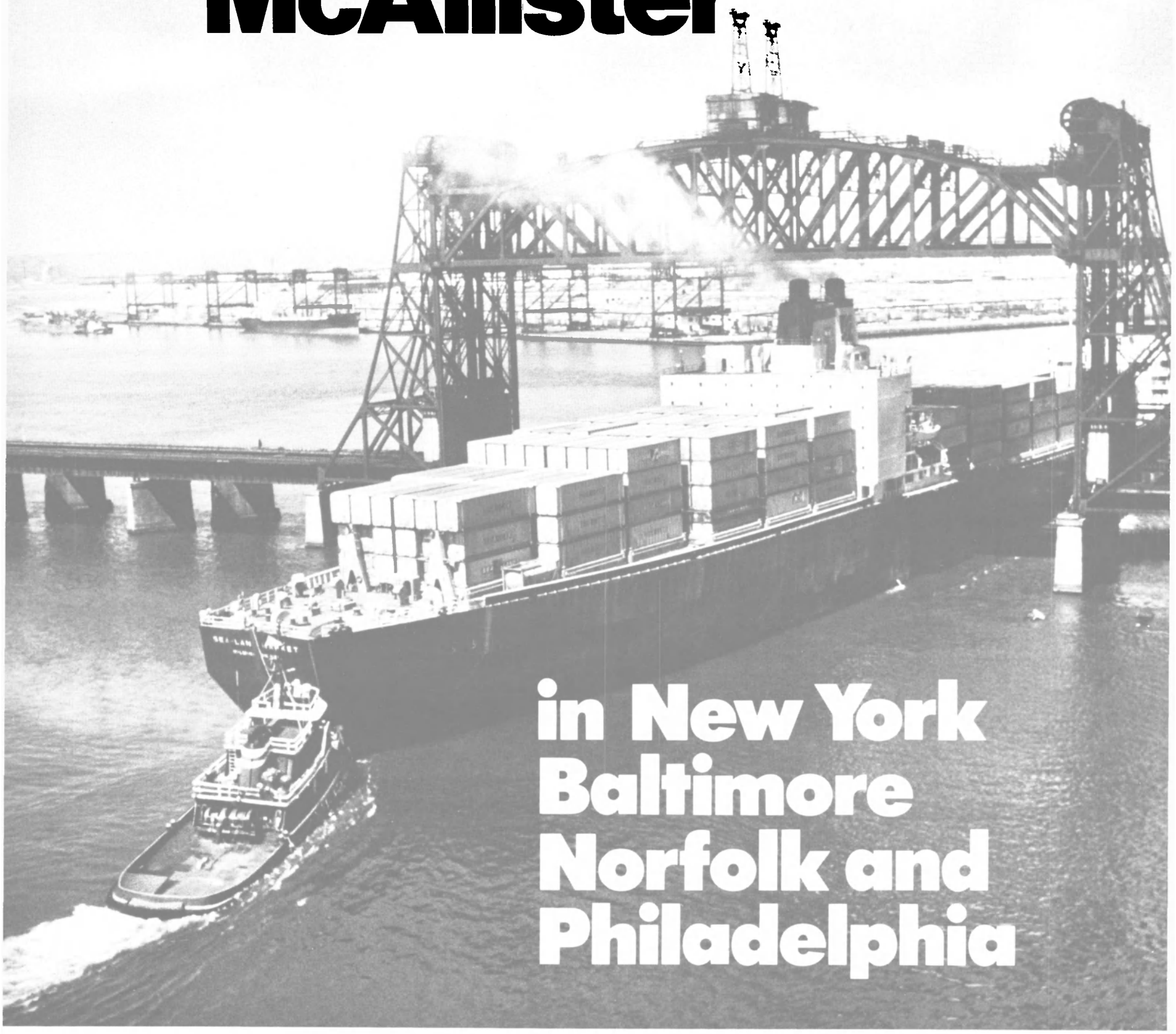

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ON THE COVER

MARITIME REPORTER Purchases New and Larger World Headquarters Offices

MARITIME REPORTER/Engineering News recently announced it has purchased new and larger world headquarters offices in New York City.

The new location will house the executive, editorial and advertising staff responsible for worldwide publishing operations in the commercial marine and naval sectors.

The publishers reported the acquisition was necessitated by a steady growth in publishing activity which resulted in an increase in staff over the past 18 months. This growth pattern included the introduction of two new major publications. The first edition of the annual Marine Equipment Catalog was published in April 1984. Because of the immediate success of this edition, the Marine Equipment Catalog will be an annual publication. The second edition will be published this month throughout the entire industry. In the fall of 1984, MARITIME REPORTER also introduced the Navy Contract Information Service, which consists of an original Navy Data Base plus ongoing reports to subscribers of computerized Navy contract data updates supplied twice monthly for inclusion in the original data base.

(continued next page)

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In addition to New York headquarters and Houston, Texas locations, MARITIME REPORTER/Engineering News magazine maintains editorial and advertising offices worldwide. Representatives of MARITIME REPORTER/Engineering News are located in Belgium, England, France, Germany, Holland, Italy, Japan, Korea and Scandinavia.

MARITIME REPORTER/Engineering News reports it is the most successful marine industry publication in the world, based on the fact that it is requested by a larger number of marine industry readers than any other marine publication in the world, and annually carries a larger number of advertising pages than any other marine publication in the world.

The new address for MARITIME REPORTER/Engineering News is 118 East 25th Street, New York, NY 10010. The new telephone number is (212) 477-6700. The ITT telex number remains the same (424768 MARINTI).

MarAd Awards $10-Million Contract To Lake Shore For Shipset Of Cranes

The Maritime Administration has awarded a $10,170,000 Navy-funded contract to Lake Shore, Inc. of Iron Mountain, Mich., for the third of three shipsets of cranes for installation on a National Defense Reserve Fleet vessel as part of the U.S. Navy's auxiliary crane ship (T-ACS) program.

To be performed under continuation of a previously negotiated contract, the work consists of construction of three twin-pedestal marine deck cranes. It is scheduled for completion in 14 months.

The cranes will be installed aboard the ex President Polk, designated as T-ACS-3 in the 12-ship series. In the event of an emergency, these ships would be deployed to off-load containers from vessels that have no cargo gear, in ports or anchorages where there are insufficient shoreside cargo-handling capabilities.

Signet Awards Wartsila Design Contract For Two Cruise Vessels

Signet Cruise Lines, Inc. a division of Houston-based Signet Corporation, has awarded a design contract for two 850-passenger world-class U.S. cruise vessels to Wartsila, one of the world's foremost designers and builders of passenger ships, **J. Barry Snyder**, president and chief executive officer of Signet Corporation, announced recently.

The proposed Signet 800-Class liners will incorporate the most advanced passenger ship design and technology to offer unequalled passenger comfort and convenience while including the ability to travel with an automobile. At the same time, the luxury cruise vessels will be designed to maximize the vessels' speed and fuel economy and to minimize maintenance and operational costs. Additionally, each vessel will incorporate essential national defense features for use by the U.S. Navy.

Wartsila, based in Helsinki, Finland, will provide the vessels' design and the plan for complete outfitting of each passenger cabin and ship's public spaces. The vessels will be constructed to the highest U.S. Coast Guard and ABS standards, will fly the U.S. flag, and will be fully eligible to operate in the U.S. coastwise trade.

The first Signet 800 cruise liner is slated for delivery during the third quarter of 1988, with the second to be delivered during the last quarter of the same year. The cruise liners will service ports in the U.S., Caribbean, and Mexico.

Houston-based Signet Corporation is a privately held group of shipping, travel, and real estate development companies engaged in bulk and energy distribution, towing, ship management, air and sea travel services, and real estate management.

Lami Appointed Sales Manager For Grandi Motori Division

Giovanni Revello Lami, formerly assistant manager of the Merchant Shipbuilding Division of Fincantieri Cantieri Navali Italiani SpA, has been named sales manager of the company's Grandi Motori Divison in Trieste.

Bailey Named Agent For Dunham/Bush Marine Products

Dunham/Bush of West Hartford, Conn., has appointed Bailey Refrigeration Company of Norfolk Va., as its national distributor to sell, install, and service all Dunham/Bush industrial refrigeration products to the marine industry.

Dunham/Bush manufactures screw and reciprocating compressors. The company is one of the pioneers in the marketing and sales of screw compressors for air conditioning and refrigeration.

Bailey has been marketing, selling, installing, and servicing the air conditioning and refrigeration needs of the marine industry for nearly 40 years. Its engineering know-how has designed and built complete air conditioning and refrigeration systems for thousands of customers.

For additional information on Dunham/Bush products,

Circle 38 on Reader Service Card

Propeller Polishing Guide Offered By Lips Propellers

Lips Propellers, a leading manufacturer and repairer of ships propellers, has published a guide on the polishing and 'super' polishing of drydocked or submerged marine propellers. The guidelines insure the desired finish achieved and also defines what is meant by the term "super polish."

A high degree of polish on propeller blades significantly improves efficiency and saves fuel. Maintenance of this condition is of great demand among vessel owners and operators but if improperly done damage, sometimes beyond repair, can result.

Lips has specified a procedure that, if followed, will avoid any risk of damage. If criteria is met, the specifications work whether Lips or a competitor does the job.

Included in the guide is a handy comparison chart that makes sense out of the various ways the surface finishes may be assessed and measurements expressed.

For a free copy of the comparison chart from Lips,

Circle 89 on Reader Service Card

The Tristan, first of four huge car/truck carriers ordered by Wallenius Lines, being delivered by Kockums.

Kockums Delivers Big Vehicle Carrier To Wallenius Lines

The first of four huge car and truck carriers ordered by Wallenius Lines for 1985 delivery from Swedish and Japanese shipyards was delivered recently by Kockums of Malmo. Named Tristan, following the owner's tradition of naming vessels after famous operas, the new carrier is almost identical to the last ship of the Madame Butterfly Class, which was delivered to Wallenius by Kockums in 1981-82.

Tristan has a capacity of 6,230 passenger cars or a combination of 2,930 cars and 540 heavy vehicles. She has an overall length of 649.6 feet, beam of 105.9 feet, depth to weather deck of 103.35 feet, and scantling draft of 37.7 feet. Deadweight on maximum draft is 28,070 metric tons. There are 13 decks, four of which are hoistable, providing a total parking area of 53,140 square meters.

The vessel is built to the highest class of Lloyd's Register of Shipping, +100 A1, +LMC, UMS, Ice Class 3, Vehicle Carrier.

The main engine is the latest model Sulzer type 7 RTA 68 with an output of 18,400 bhp, with constant-pressure supercharging and the power output optimized for minimum fuel consumption. The propulsion machinery is direct-reversible and connected to a fixed propeller, and is remote-operated from the bridge or the engine control room. Service speed is 20 knots.

Electrical power is supplied by three Wartsila-Vasa diesel engines, each driving a 2,000-kva alternator, all installed in a separate generator room. Tristan is a unifuel ship, with main and auxiliary engines all burning the same type of heavy fuel oil, up to 600 cSt.

Heavy vehicles are loaded on the 4th, 6th, and 9th decks, which are reinforced to carry heavy loads. The 5th, 7th, 10th, and part of the 8th decks are divided into hoistable sections, which allow vehicle heights of up to 20 feet 4 inches.

The 6th deck is normally the car entrance deck, but at higher berths the middle outside ramp may also be attached to deck No. 7. The two outside loading ramps are positioned at the starboard side; the aft one will be rigged with 25-degree aft angle to provide loading of long vehicles. Internal ramp systems between decks to doors and to openings in transverse bulkheads make it possible to load/discharge the entire ship via one of the outside ramps.

Distributed along the entire length of the ship are 53 fans that have the capacity to change the hold air volume 25/50 times per hour. They are operated in sections or individualy from a separate control room on the upper deck, from which ballast pumps and valves are also manipulated.

All navigational equipment is of the latest design. The radar unit has anti-collision computer, with free choice of picture presentation and other possibilities. The autopilot is a totally self-adaptive, fuel-saving type with set radius steering for turns. Ship's position is indicated by a Navstar unit (Decca Navigator) as well as a Magnavox satellite receiver. Speed log equipment is duplicated, with a pressure log for deep waters and a doppler unit for restricted waters. The radio station is equipped with a Maritex unit.

Red Fox Negotiating Licensing Agreement With John G. Kincaid

Scottish marine engineers John G. Kincaid is negotiating a licensing agreement with Red Fox Inc. of New Iberia, La. to produce the U.S. company's range of effluent treatment equipment for offshore oil and other marine installations.

The license, which would give Kincaid the U.K. manufacturing rights for a one-off payment, was initiated by the Technology Transfer Division of the Scottish Development Agency.

The division monitors licensing opportunities abroad collated by its own offices in the U.S. and Europe and from British embassies and consulates. These are computer-matched to Scottish companies with equivalent expertise who are looking to diversify. The Kincaid/Red Fox negotiations are one of a number of license ventures that have been initiated by the division in the last few months.

Konopasek & Associates Now Reorganized As Maritime Design, Inc.

J.L. Konopasek & Associates, naval architects and marine engineers of Jacksonville, Fla., has been reorganized under the name Maritime Design, Inc.

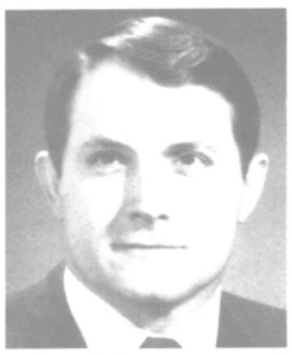
President **Jim Konopasek** announced that the reorganization is in response to market needs for effective numerical control production programming. He reports a very responsive turnaround for new design work, which he attributes to the firm's in-house CADD system and the ability to efficiently develop and store composite hull designs as well as to offer pipe and duct routing.

Maritime Design will continue to offer marine design services to both commercial and government clients.

Circle 47 on Reader Service Card

Management Changes At Burrard Yarrows

Quintin Watt



F.W. LaRoue

Burrard Yarrows Corporation, Canada, have announced two changes in management structure.

Quintin Watt, formerly director, marketing has been named vice president, marketing. **F.W. (Butch) LaRoue**, formerly director of personnel and industrial relations has been named vice president human resources.

Ocean Studies Conference Slated For June 16-19 At University Of Rhode Island

Resources, boundaries, and management of the U.S. continental shelf region will be the focus for the ninth annual Center for Ocean Management Studies conference to be held June 16-19 at the University of Rhode Island.

The conference will begin with an overview addressing the natural resources of the shelf, the changes in the concept and legal definitions of the shelf, and the role it has played in international policy decisions. Following that, specific continental shelf management issues and their implications will be addressed from a variety of perspectives. These will include revenue-sharing and reauthorization of the Coastal Zone Management Act. Also, the Department of the Interior's proposed Five-Year Leasing Program will be examined in terms of its policy and impacts on the management of the hydrocarbon resources of the U.S. continental shelf.

Chairman of the conference is Dr. **Thomas Grigalunas**, professor in the URI Department of Resource Economics. The cost of the four-day meeting is $135, which includes a reception on Sunday, June 16, attendance at sessions, banquets on Monday and Tuesday, and a copy of the conference proceedings.

Further information and advance registration is available through the Center for Ocean Management Studies, Ruggles House, University of Rhode Island, Kingston, R.I. 02881; (401) 792-2145.

Multi-Unit Manifold Filter Systems For Continuous Engine Operation Offered By Dahl Manufacturing

Dahl Manufacturing, Inc. has announced a full line of multi-unit manifold systems for their Models #100, #200, and #300 series Diesel Fuel Filter/Water Separators. The manifold systems are developed for heavy fuel flow needs. They also meet the requirements for continuous engine operations such as generator sets, marine and industrial applications. In these situations, by-pass valves are used to isolate and service one unit while operating on the other. For large operations, triple units are available to meet extra heavy fuel flow filtering requirements.

Dahl Manufacturing, Inc. is headquartered in Ceres, Calif. They are represented by distributors throughout the United States and Canada as well as overseas.

For more information on the multi-unit manifold filter systems from Dahl Manufacturing,

Circle 6 on Reader Service Card

Howard And Woelfel Promoted At Koomey

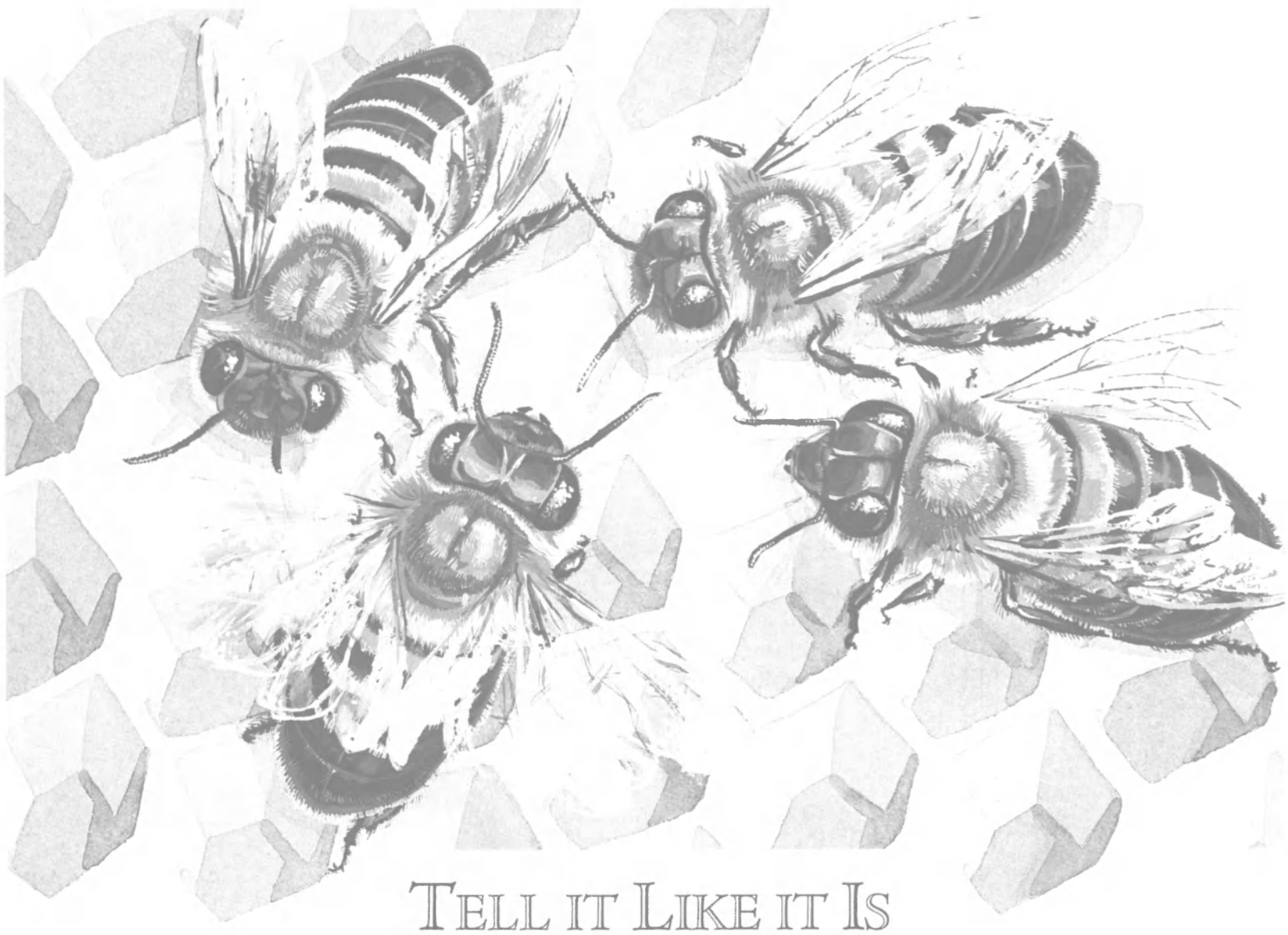
Koomey Inc., Brookshire, Texas, recently announced the promotion of **R.M. Howard Jr.** and **Al Woelfel.**

R.M. Howard

Al Woelfel

R.M. Howard has been named director of engineering and **Al Woelfel** has been named director of research and development.

Both Mr. **Howard** and Mr. **Woelfel** have been with Koomey for some time and have made many important developments in the J-LINE™ blowout preventers.



Tell it Like it Is

Nature's all-around communications champ is the everyday honey bee. Workers, in an intricate dance, transmit the information needed by the hive to gather food for survival. Flower type, source, quality, direction, and distance are all clearly indicated. When ranges are short, for example, the bee simply alternates direction in a circular motion. For longer ranges, a more complicated figure 8 is used. In this case the straight portion of the movement between loops shows direction relative to the sun and the intensity of the dance indicates distances, which can be well over a mile.

In marine communications, Furuno also covers all ranges with a product line providing the most desired features, plus traditional Furuno quality.

The FM-252 is a fully synthesized radiotelephone covering all available marine VHF-FM and weather channels, with frequency selection via touchpad keys. Dual-channel scanning and digital readout of selected frequency are standard.

For longer ranges, the Furuno/skanti TRP 8258 S offers 250-watt PEP output power and is fully synthesized from 1.6 to 30 MHz. An exceptionally fast automatic antenna coupler and microprocessor control of all functions permit ARQ compatibility.

Look to Furuno for your total communications needs. For complete information, visit one of our more than 200 authorized dealer outlets, and be sure to ask about our exclusive Life-Line warranty program.

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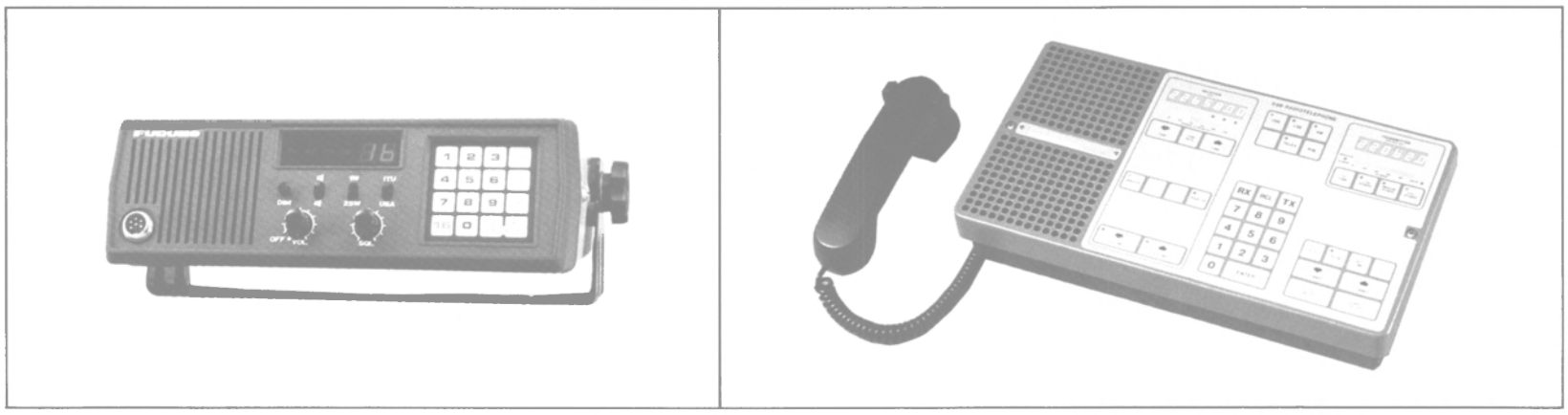

Nor-Shipping '85

Shipping and Maritime Offshore Exhibition & Conference 6—10 May 1985

Nor-Shipping '85, the tenth in this series of compact, high-quality shipping exhibitions and conferences, will be held May 6-10 at the Sjolyst Exhibition Centre in Oslo. Since its inception in 1965, Nor-Shipping has been one of the leading exhibitions in the world within the international maritime sector.

Organized by The Norwegian Fair Organization (Norges Varemesse), the Oslo event has until now concentrated on the traditional shipbuilding and shipping sectors. This year Nor-Shipping will have a significant new appearance, as for the first time the exhibition as well as the conference will focus on the total maritime transport aspect, including offshore-related activities. This was made possible by incorporating another Norwegian exhibition and conference, Offshore Supply, as part of Nor-Shipping. Organized by Selvig Publishing, Offshore Supply had been held several times previously at Sandvika, near Oslo. Nor-Shipping has now adopted a new subtitle—International Shipping & Maritime Offshore Exhibition and Conference.

By incorporating offshore into the traditional maritime environment at Nor-Shipping, the organizers have followed the pattern drawn up by the Norwegian Shipowners' Association, as well as a strong trend that commenced in the early 1970s when Scandinavian shipowning companies became heavily involved in the North Sea continental shelf activities.

Norges Varemesse and Selvig Publishing have agreed upon a common future presentation, with Offshore Supply included in Nor-Shipping. This is considered the best total presentation of marine activities, and totally in step with the wishes of exhibitors and visitors alike.

The Exhibition

Visitors to Nor-Shipping '85 will find a broad range of exhibitors related to the international shipping, shipbuilding, and maritime offshore environment. These will include financial institutions, classification societies, harbor and canal authorities, marine underwriters, shipping and export organizations, shipbrokers, shipbuilding and ship repair companies, ships' gear suppliers, suppliers of stores and bunkers, mobile oil rigs, drilling ships, accommodation platforms, offshore service vessels, heavy-lift vessels, research and pipe-laying craft, and all specialized equipment required aboard these vessels, as well as transport companies and others dealing with or connected to the shipping industry and maritime offshore activities.

At Nor-Shipping '83, nearly 700 manufacturers and other organizations were represented at the exhibition, which was visited by some 8,500 professionals from 44 countries. This Oslo show is not open to the general public, which accounts for the high quality of its attendance. Nor-Shipping is well covered by the maritime press, nationally as well as internationally. Approximately 150 editors and journalists from all over the world were registered at the 1983 event.

The Conference

As in previous years, a Conference will take place concurrent with the Exhibition, during the period May 7-9. The fact that Nor-Shipping '85 is going to include maritime offshore activities for the first time indicates that related topics will also be found on the Conference Program.

Chairman of the Nor-Shipping '85 Conference Committee is **Jan-Erik Dyvi**, Norwegian shipowner well known for his innovations within the offshore sector as well as in shipping. This year the Conference has been extended from two to three days. Tuesday, May 7 is a Technical Day with emphasis on various improvements in ship technology and their impact on operating profit. The first session on Wednesday, May 8 will be devoted to present and future prospects of the maritime offshore market, followed by a view on business possibilities as a spin-off effect from offshore activities. The next session on Wednesday will be a discussion of the topic. "The Statfjord Gas Terminal—a new North Sea LPG Plant—Markets and Transportation."

Thursday, May 9 will open with the main theme, "Is it Possible to Lessen the Burden of the Shipping Crisis by Other Means than Scrapping?" The second and last session on Thursday has been given the general heading, "Crises and Reforms in International Economic and Monetary Systems."

Speakers at all sessions will be leading international experts in their fields, from all over the world.

The organizer of Nor-Shipping, Norges Varemesse, is a foundation organized by Norwegian industry and trade, and since 1920 has been actively engaged in extensive exhibition activities in Norway. The Norwegian Shipowners' Association and The Export Council of Norway are also closely involved in the Nor-Shipping exhibitions. The marketing of Nor-Shipping '85 is being executed in cooperation with K/S Selvig Publishing A/S.

CONFERENCE PROGRAM
Tuesday, May 7, 1985
Section I
TECHNICAL DAY

Chariman: **Erik Heirung,** Director, IKO Maritime A/S, Oslo, Norway.

8:30-9:00 a.m.—Registration.

9:00-9:05—Opening of the Conference by **Jan-Erik Dyvi,** Shipowner, Chairman of the Conference Committee.

9:05-9:10—Introduction by the Chairman of The Section.

9:10-9:40—"Where is the Limit to the Efficiency of Diesel Engines," by **Anders Ostergaard,** Mechanical Engineer, M.Sc., Chairman, International Power Engineering A/S, Copenhagen, Denmark.

9:40-10:00—Forum discussion.

10:00-10:20—"How to Reduce Ships Resistance?"—"Hull Forms," by **A. Jonk,** Head Project Department Ship Powering Division, Wageningen, the Netherlands; Co-author: **Jan van de Beek,** Deputy Head Handling Ship Powering, Wageningen, the Netherlands.

10:20-10:40—"Hull Forms," by **E. Vossnack,** Naval Architect Nedlloyd Fleet Services, Rotterdam, the Netherlands.

10:40-11:00—Coffee break.

11:00-11:20—"Choice of Propeller," by **Kjell Holden,** Civil Engineer, Norwegian Hydrodynamic Laboratories, Trondheim, Norway.

11:00-12:00—Forum discussion and summary by the chairman.

12:00-1:30 p.m.—Lunch.

1:30-2:00—"The Use of Computers in Design and Production of Ship Hulls," by **Cato F. Sverdrup,** Managing Director, Burmeister & Wain Skibvaerft A/S, Copenhagen, Denmark.

2:00-2:20—"Running, Maintenance and Crewing of Ships," by **Charles R. Cushing,** President, C.R. Cushing & Co. Inc., New York, N.Y.

and

2:20-2:40—Otto H. Fritzner, Technical Director, L. Gill Johannessen & Co., Oslo, Norway.

2:40-3:00—Coffee break.

3:00-3:20—The project "Ships of the Future" ("Schiff der Zukunft"), by **Uwe Fuchs,** Captain/Marine Superintendent, Vergand Deutsche Reeder, Hamburg, West Germany.

3:20-3:50—"What can Shipowners do to Protect Themselves Against Harm From Poor Fuel?" by **Kjell Haugland,** General Manager, Veritas Petroleum Services, Oslo, Norway.

3:50-4:50—Forum discussion and summary by the chairman.

Wednesday, May 8, 1985
Section II

OFFSHORE ACTIVITIES —CHALLENGES AND POSSIBILITIES

Chairman: **Egil Gade Greve,** President and Chief Executive Officer, Bergen Bank A/S, Bergen, Norway.

8:30-9:00 a.m.—Registration.

(continued on page 12)

Are there two the same?

Probably not. But climate control systems from Flakt can handle any extreme and any air treatment job you could imagine, whether shipboard or offshore, North or South, hot or cold. Flakt systems provide air conditioning, ventilation and air distribution on more than 4500 ships, in over 50% of the fixed platforms and in a number of rigs in the North Sea; plus many other platforms and rigs all around the world.

To handle that sort of variety and demand you need the products, the know-how and the back-up. And Flakt has it. With the backing of the world's largest research and development organization devoted entirely to air treatment and climate control systems, Flakt is certain to be able to provide the solution to your ship or offshore HVAC requirements.

Fläkt Marine

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(continued)

9:00-9:10—Introduction by the Chairman.

9:10-10:10—"The Norwegian Fleet of Mobile Offshore Drilling And Service Units—What can They Offer?" by **Peter T. Smedvig,** Chairman, Peder Smedvig Aksjeselskap, Stavanger, Norway.

Forum discussion.

10:10-10:30—Coffee break.

10:30-11:30—"The Global Market Outlook for Mobile Drilling and Service Vessels," by **Ole-Jacob Kvinnsland,** President, Norcil Group, Stavanger, Norway.

Forum discussion.

11:30-12:45—"New Business Opportunities as a Spin-Off From the Search for Oil and Gas in the Northern Seas," by **Arild Rodland,** State Secretary, Norwegian Ministry of Petroleum and Energy, Oslo, Norway.

Forum discussion

12:45 p.m.—Lunch.

Section III

THE STATFJORD GAS TERMINAL —A NEW NORTH SEA LPG PLANT —MARKETS AND TRANSPORTATION

1:15-1:45 p.m.—Registration.

1:45-4:00—Panel Discussion—The above topic will be discussed between the following persons:

Chairman: **Eivald M. Q. Roren,** Executive Vice President, Det norske Veritas, Oslo, Norway;

Jacob Oxnevad, Executive Vice President, Statoil, Stavanger, Norway, Representing the Producer;

Nils E. Breivik, Vice President, Trammo Gas & Petrochemicals Ltd., London, England, Representing the Trader;

Th. H. Walthie, Director Feedstock Supply, Dow Chemical Europe SA., Horgen, Switzerland, representing the Buyer.

2:30-2:50—Coffee break.

Thursday, May 9, 1985
Section IV

IS IT POSSIBLE TO LESSEN THE BURDEN OF THE SHIPPING CRISIS BY OTHER MEANS THAN SCRAPPING?

Chairman: **David Vikoren,** Director General, The Norwegian Shipowners' Association, Norway.

8:30-9:00 a.m.—Registration.

9:00-9:10—Introduction by the Chairman.

9:10-9:40—"Will an Improvement in World Economy Solve the Shipping Crisis?" by **Victor D. Norman,** Professor, The National Norwegian School of Economics and Business Administration, Bergen, Norway.

9:40-10:10—"Yesterday's Ships for the Needs of Tomorrow—is Upgrading or Conversion a Better Solution than Newbuilding?" by **H.B. Moller Pedersen,** Technical Manager, The East India Co. Ltd., Copenhagen, Denmark.

10:10-10:30—Coffee break.

10:30-11:00—"Why not Arrange the Same Finance Conditions for Suitable Secondhand Tonnage as for Newbuildings?" by **Olaf Peters,** Member of the Board, Management Schiffshypothekenbank zu Lubeck AG, Kiel, West Germany.

11:00-11:30—"Creating Increased Seaborne Trade by Better Transportation Methods" by **Clyde L. Jacobs,** Vice President and General Manager, Seaboard Shipping Co. Ltd., Vancouver, Canada.

11:30-12:15 p.m.—Discussion and summary by the Chairman.

12:15—Lunch.

Section V

ECONOMIC AND MONETARY COOPERATION—A CHALLENGE FOR GROWTH AND STABILITY

Chairman: **Leif T. Loddesol,** President and Chief Executive Officer, Den Norske Creditbank, Oslo, Norway.

12:45-1:15 p.m.—Registration.

1:15-1:30—Introduction by the Chairman.

1:30-2:15—Prepared Papers to be Introduced by **Wilfred Guth,** Member of the Board of Managing Directors, Deutsche Bank AG, Frankfurt/Main, West Germany; **Henry C. Wallich,** Member, Board of Governors, Federal Reserve System, Washington, D.C.; **David G. Scholey,** CBE, Joint Chairman, S.G. Warburg & Co.

Ltd., London, England; and **Hermod Skanland,** Deputy Governor Bank of Norway, Oslo.

2:15-2:45—Coffee break.
2:45-3:45—Panel discussion.
3:45-4:00—Summary by the Chairman.

4:00-4:10—Closing of the Conference by **Jan-Erik Dyvi,** Shipowner, Chairman of the Conference Committee.

Pyramid Pump Division Offers New Catalog On Rotary Pump Lines

Pyramid Pump Division™ of Transamerica Delaval Inc. of Monroe, N.C., has just published an illustrated 16-page catalog that presents engineering information on three lines of positive-displacement pumps.

Its AMR™ three-screw pumps are designed for: engine room, fire room, and shipboard hydraulic services; dedicated liquid cargo carriers; fuel handling in utilities and industrial power installations; lube and seal oil services in rotating machinery; and high-viscosity refining, chemical, and process applications. Capacities range from one to 3,500 gpm, pressures to 4,500 psig, and shaft speeds to 10,000 rpm.

GTS® geared twin-screw pumps are for multi-cargo tankers and high-volume applications in pipelines, utilities, refineries, and chemical and process plants. Capacities are from 50 to 8,500 gpm, pressures to 400 psig, and shaft speeds to 3,600 rpm.

CIG® crescent internal-gear pumps for hydraulic fluid power systems; they are available in 1-460 gpm capacities, pressures to 4,600 psig, and shaft speeds to 9,000 rpm.

The new catalog features a fold-out pump selector that presents tabular data on flow, pressure, power, size, shaft speeds, and temperature ranges for 34 different series of Pyramid Division pumps.

For a free copy of Bulletin GP-84,

Circle 21 on Reader Service Card

Haggett Named Board Chairman For Shipbuilders Council Of America

William E. Haggett

At a recent quarterly meeting of the Shipbuilders Council in Washington, D.C., **William E. Haggett,** president and chief executive officer of Bath Iron Works Corporation in Bath, Maine, was elected chairman of the board of directors of the Council, succeeding **David H. Klinges,** vice president-Marine Construction group, Bethlehem Steel Corporation. **Hans K. Schaefer,** president of Todd Shipyards Corporation, was elected vice chairman. Both will serve a one-year term.

At the same meeting, the following were elected to the Executive Committee of the council: **Thomas T. Balfour,** General Electric; **Edward J. Campbell,** Newport News Shipbuilding; **C. Larry French,** National Steel and Shipbuilding; **George K. Geiger,** Bay Shipbuilding; Mr. **Haggett;** Mr. **Klinges; James R. Mellor,** General Dynamics; **John L. Roper III,** Norshipco; **Gerald J. St. Pe,** Ingalls Shipbuilding; Mr. **Schaefer;** and **Lawrence A. Smith,** Lockheed Shipbuilding.

Elected as officers for the coming year were: **M. Lee Rice,** president; **Jed L. Babbin,** vice president and general counsel; **W. Patrick Morris,** vice president; **John S. Rivers,** vice president and secretary; **John J. Stocker,** vice president; and **Beverly C. Kendall,** treasurer and assistant to the president.

Valmet Specializing In Meeting Requirements Of The Offshore Industry

Valmet Corporation, Finland, and the engineering and consulting company Foster Wheeler Petroleum Development Limited, United Kingdom, signed a technical cooperation agreement in January with respect to offshore projects. The agreement is part of Valmet's Arctic offshore strategy and a big step forward in preparing for the expected changes in Soviet demand. With the agreement, Valment will have access to the latest technology in offshore engineering, since Foster Wheeler Petroleum Development is one of the forerunners in the field.

Valmet is one of Finland's main industrial groups, comprising a large number of engineering works and shipyards. Valmet Shipbuilding Group consists of three shipyards specializing in sophisticated vessels ranging from small tugs and fishing vessels to big barge carriers. Its capabilities for the offshore market include research and accommodation vessels, oil pollution combating and Arctic vessels, and a new type of supply vessel. It also designs, engineers and manufactures research, service and construction vessels as well as topside modules for the offshore industry, and Valmet's large design force makes it capable of tailoring solutions to the last detail. Most designs are Arctic class, making year-round Arctic transportation possible.

Circle 4 on Reader Service Card

Racal Marine Names Champ Marketing Manager

Eric Tyler, president of Racal Marine Inc., recently announced the appointment of **Christopher R. Champ** as marketing manager of Marine Systems, with prime responsibility for the sale of Racal-Decca products to the deep sea marine market in the United States.

Mr. **Champ** brings considerable experience in the international marine field to this new position, having spent 19 years in the business, during which he occupied a number of senior positions with Racal Electronics Plc, the parent company of Racal Marine Inc.

Reporting to Mr. **Champ** will be newly appointed sales manager of marine products for New York, Ms. **Marie Santoro**. Ms. **Santoro** has been with the company for 10 years, and has been a member of the New York area sales team since 1979.

Both Mr. **Champ** and Ms. **Santoro** will be based at Racal Marine Inc.'s new Northeast Regional sales office located in East Orange, N.J.

New Diagnostic Kit From Aeroquip Corp. —Literature Available

Aeroquip Corporation, Jackson, Mich., has introduced their new Quick Check® Diagnostic Kit. The kit contains Aeroquip FD90 Quick Disconnect couplings for permanent installation in system test ports for easy diagnosis of hydraulic problem symptoms before a failure occurs. The mating halves of the coupling are attached to test hoses and pressure gauges. The self sealing feature of the FD90 coupling prevents the loss of fluid through an open test port that could result in injury from hot oil or fire.

The kit features two Aeroquip FC432-03 Polyon® thermoplastic non-conductive hose assemblies with one male and one female coupling on each end, in lengths of five and ten feet; four easy-to-read glycerin-filled gauges with 2-½-inch-diameter faces, capable of reading vacuum to 7,000 psi and attached female coupling halves; and an assortment of 13 FD90 Series male coupling halves in common port threads for installation on the equipment to be tested. The products are packed in an aluminum reinforced ABS plastic carrying case that has a custom oil resistant structural foam insert to hold components in place. Accessory trays hold miscellaneous parts such as O-Rings and adapters with enough space left over for extra hose.

For a copy of Bulletin 5990 (Quick Check Diagnostic Kit),

Circle 1(on Reader Service Card

Marine Machinery Association Issues Invitation To Attend May 1, Meeting In D.C.

The Marine Machinery Association, a one-year-old trade association devoted to improving business conditions for manufacturers of the machinery used on Navy and commercial ships and to improving the quality of spare parts and repair services for the machinery in the fleet, has announced that its next meeting will be on Wednesday, May 1, 1985, from 2 p.m. to 5 p.m. at the Shoreham Hotel, 2500 Calvert Street, N.W. in Washington, D.C.

Representatives of Marine Equipment manufacturers interested in attending this meeting should follow instructions given in the last paragraph of this report.

The theme for the meeting is "Increased Competition—Decreased Quality; Solving the Quality Problem in Navy Acquisition Planning." A partial roster of speakers for the meeting includes **J.J. Genovese**, Program Manager, Breakout Program, Naval Supply Systems Command PML-550; the Honorable **Robert McClory**, former Member of Congress; and **Richard B. McFarland**, Executive Director, Ships Parts Control Center.

The Association held its first membership meeting in Washington on February 7, 1985, after being formed as a District of Columbia nonprofit corporation a year ago to improve conditions in the industry. Attending the February meeting were a group of 40 leading executives of manufacturers of shipboard machinery. Elected to serve on the board of directors were **D.M. Choate** of Turbodyne Division, Dresser Industries, Inc.; **J.E. Flannigan** of Terry Corporation; **James P. Fromfield of Leslie Co.; Larry J. Holley** of Warren Pumps Division, Houdaille Industries, Inc.; and **Jack P. Janetatos** of Baker & McKenzie. **Janetatos** was elected to serve as president, and **D.A. Marangiello** of ORI, Inc. was appointed to serve as the executive director.

The Association has established headquarters at 1629 K Street in Washington and has worked actively over the past year at its first goal—improving the quality and reliability of spare parts and repair services for auxiliary machinery in the Navy's fleet.

Mr. **Janetatos** reported that as the result of the Association's position, the spare parts legislation passed by Congress last year contained a cautionary note in the committee report that it was the intent of Congress that "the emphasis on securing more competition not result in a degradation of product quality, reliability or maintainability." The representatives of the 17 corporate members of MMA were told, however, that the problem of low quality in spare parts and repair services continues, and considerable efforts must be made if any improvement is to be had. "Under the acquisition systems now in place," Mr. **Janetatos** said, "the fleet can have no confidence that the spare parts in the Navy stock system will work in their machines or that overhaul services by repair activities will result in machines that operate up to standard."

Capt. **A. Howard Allnut** of the Naval Sea Systems Command emphasized the Navy's awareness of the problem. He reported that all eight naval shipyards had experienced high and growing rework costs in the overhaul of critical rotating machinery in the past two years. Captain **Allnut** said that NAVSEA, working with the Naval shipyards, was undertaking a program to improve quality and reliability in overhauls by buying spare parts kits for overhaul directly from original equipment manufacturers.

In a lively and frank exchange of views between Navy representatives and member company officials, obstacles faced by both government and industry in this new program were addressed. Navy representatives were particularly concerned with statutory restrictions placed upon them by Congress in last year's well-publicized spare parts controversy. They believe they are required to seek competition even when they lack the technical data necessary to write specifications. Industry officials pointed to the degradation of fleet capability resulting from the purchase of parts without

(continued on page 16)

Marine Machinery Association

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data adequate to describe the parts and verify their quality. They voiced particular concern over the security given to their technical data in the hands of the government. The Navy responded that plans are being made to increase security on technical data and to impose quality restrictions on all suppliers.

Heightening industry's concern on data questions was a plan revealed by the Defense Logistics Agency to make public release of Identification Lists which contained data lifted from proprietary data submitted by industry. Many of the company executives expressed concern that the government would use DLA's tactic as a precedent to foster increased releases of proprietary data despite contractual and statutory prohibitions. In light of current planning for increased use of reverse engineering by NAVSEA, any release of data, no matter how small, was viewed as important.

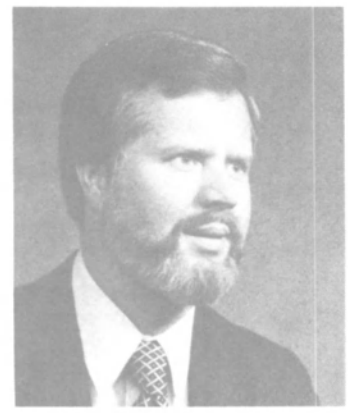
The Association members agreed to step up their efforts by bringing the facts concerning the low quality of parts to the attention of Congress. The Association also promised the Navy representatives their full support and cooperation in improving the quality and reliability of the Navy's parts inventory.

Founding members of the Marine Machinery Association are: Aurora Pump; Byron Jackson Pump; Cameron Pump; Elliott Company; Gimpel Corporation; Hardie-Tynes Manufacturing Co.; John Crane; Ingersoll-Rand Company; Ingersoll-Rand Compressor Division; Leslie Co.; Pacific Pump; Terry Corporation; Transamerica Delaval Inc.; Treadwell Corporation; Turbodyne; Vacco Industries; Viking Pump; Warren Pump; and Worthington Pump.

At the conclusion of the next meeting of the Association from 2 to 5 p.m. on May 1, at the Shoreham Hotel in Washington, D.C., a cocktail hour is scheduled from 5 p.m. to 6 p.m.

Those interested in attending the meeting or joining the Association should contact **Jack Flannigan,** Terry Corporation, Industrial Road, Niantic, Conn. 06357, phone: (203) 739-6271, or write directly to Marine Machinery Association, 1627 K Street, N.W., Suite 600, Washington, D.C. 20006.

Abbott Appointed Vice President For NKF Engineering



Jack W. Abbott

Jack W. Abbott has recently joined NKF Engineering, Inc. in its Business Development and Advanced Programs Division. He has been with the U.S. Navy for the past 12 years as a civilian division director and program manager. Prior to that he was in private industry for 10 years as a development engineer working on the first marine application of gas turbine engines for both U.S. and Canadian destroyers.

Mr. **Abbott** is a graduate of Stanford University and holds a professional engineer's license. He is currently chairman of the Chesapeake Section of SNAME and has been a long-time active member of ASNE.

Located in Vienna, Va., NKF provides engineering services and technical expertise in the areas of systems engineering, shock analysis, naval architecture, marine engineering, acoustic and vibration analysis, structural design, ship and submarine survivability, and test and evaluation.

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Marine Machinery Association

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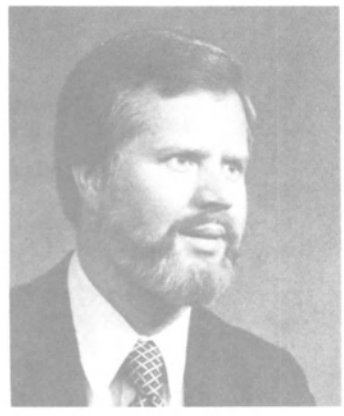

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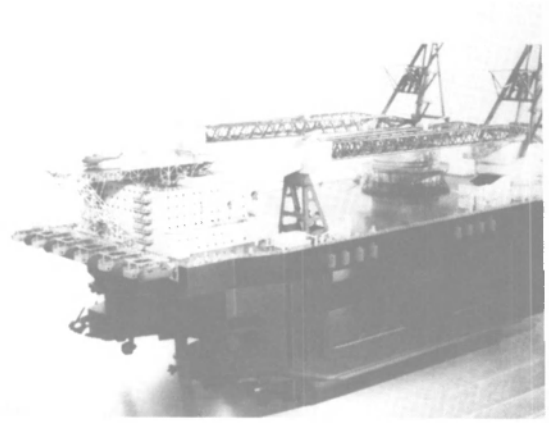
Fincantieri To Build Huge Offshore Workship For Micoperi

Fincantieri-Cantieri Navali Italiani SpA, headquartered in Trieste, recently signed a contract with Micoperi SpA of Milan for the construction of a big, versatile offshore workship. The Micoperi 6000 will be a self-propelled, semi-submersible ship made up of two hulls, each 541.33 feet long and 108.27 feet wide, on which will be mounted a platform almost 575 feet long and about 285 feet wide, supported by a polygonal column structure. Depth to the main deck is 142.7 feet, and to the helicopter deck 221.5 feet. Draft can range from 34.5 to about 94 feet under the most severe operating conditions; the ballasting and deballasting is performed quickly and safely by means of a computerized system.

An outstanding feature of the ship is its immense lifting capacity, provided by two swiveling pedestal cranes, each with a capacity of 6,000 tons—the largest ever installed on a floating unit.

Dynamic positioning of the ship is achieved, even under the most severe weather and sea conditions and to a water depth to 1,475 feet, by a 10-propeller, fully computerized system. The ship is also equipped with 16 mooring lines, totaling more than 177,000 feet. Ten diesel generating sets have a total output of 50,000 kw, supplying electrical power for propulsion, cranes, and other on-board requirements.



The ship will be able to accommodate up to 800 persons in living quarters of the highest standard; amenities will include a hospital, swimming pool, cinema, conference rooms, and other activities areas.

The Micoperi 6000 has been designed to perform the following operations: platform installation, piledriving to secure platforms to the sea bottom, module hoisting, transport of heavy structures, platform removal and repair, employment of divers and frogmen, and logistic and technical assistance to workers engaged in platform assembly and outfitting. A heliport atop the superstructure will accommodate two large helicopters.

The Fincantieri Group is the largest and most diversified shipbuilding and ship repairing company in the Mediterranean. It is organized in four divisions—merchant shipbuilding and diesel engine manufacturing, both with head offices in Trieste, and naval shipbuilding and ship repair headquartered in Genoa.

The Group's production activity, through 16 shipyards located throughout Italy, includes construction of merchant ships of every type and size, offshore units, naval vessels, repair and conversion of every type of ship, and manufacture of two- and four-stroke diesel engines for propulsion of merchant and naval ships and for on-board generating sets.

For the offshore market, Fincantieri builds ships and other floating craft and units of every conceivable type, tension-leg production platforms, top-side facilities for production platforms, single-buoy mooring units, and submarine working craft. Alternative construction fields include power-generation, desalting, and other floating plants; and onshore modules and desalting units.

Circle 85 on Reader Service Card

J.J. Henry Names Roco Lofaro Chief Electrical Engineer

Charles H. Gross Jr., vice president of J.J. Henry Company, Inc. recently announced the promotion of **Rocco Lofaro Jr.** to chief electrical engineer in their New York office.

ARE YOU RESPONSIBLE FOR MAINTENANCE COSTS?
THE BOTTOM LINE IS COST REDUCTION.

TAKE A GOOD LOOK AT THE FACTS ABOUT THE PRORECO DECK COATING SYSTEM WHICH HAS A HISTORY OF PROVIDING A SIGNIFICANT REDUCTION IN DECK MAINTENANCE COSTS.

- ***FACT*** No repetitive metal surface preparation cost — one time only.
- ***FACT*** Complete elimination of metal loss and replacement due to corrosion.
- ***FACT*** Providing a fire-retardant, fuel and oil resistant, protective deck covering with 3 to 7 times the service life of other coatings.
- ***FACT*** A minimum of 50% reduction in labor and material deck maintenance costs.
- ***FACT*** A 15 year service history of providing deck maintenance cost savings on all types of high wear deck surfaces including aircraft carrier flight decks, helicopter landing platforms on military ships and on offshore drilling rigs, cruise ships, cable laying ships, ice breakers, fishing vessels and ocean going towboats of all types.

REDUCE

Most deck coatings have a fatal flaw.

Even when they're called "heavy duty," conventional paint-type coatings are brittle. Thin. They crack, chip, and spall easily because they have no long-term resistance to a ship's normal structural movement and vibration. Nor do they resist impact.

Moisture is harmless, until your deck coating gives it a break.

Once moisture reaches your steel deck, harmful corrosion begins. Immediately. Constant replacement and costly maintenance are the only solution.

A PRC Proreco coatings system protects your deck better, because it protects itself. The elastomeric base coat is not brittle, so it won't crack like epoxy coatings or cement-type deck coverings. It resists the heaviest impact and abrasion. The corrosion-inhibiting primer does not sacrifice itself as does zinc, so it stops corrosion short even if a rupture occurs.

No other company offers products with a track record of more than 10 years' service with virtually no maintenance costs.

All types of ships use the PRC Proreco systems to virtually eliminate ongoing deck maintenance costs: towboats, offshore rigs, cruise ships, commercial fishing boats, U.S. Naval and U.S. Coast Guard ships of all types.

Ask about our Proreco interior and exterior decking systems. Write to Rodney N. Morris, Marine Products Manager, Products Research & Chemical Corp., P.O. Box 1800, Glendale, CA 91209.

Proreco® Deck Coating Systems

Before a coating can protect your deck, it has to protect itself.

PAINT AND ZINC

PRC PRORECO® III

...replacement. ... Whether you operate ... boats, 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.

... resilient PRORECO® III system protects ... against impact as well as corrosion. ... with three layers: a corrosion inhibitive ...

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

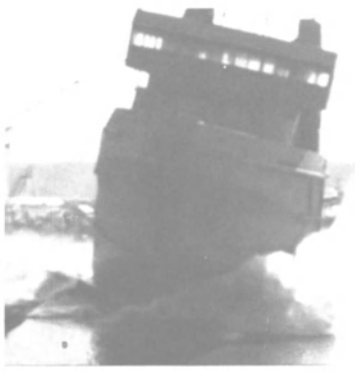
The PRORECO® III Deck Coating System

CO$TS

The PRORECO® III Deck Coating System

Products Research & Chemical Corporation
5430 San Fernando Road, P.O. Box 1800
Glendale, CA 91209
(213) 240-2060

Stork-Powered Tug/Supply Vessel Launched By Quality Shipyards



The first of Zapata Gulf Marine Corporation's "super-size" anchor-handling, tug/supply vessels, the Gulf Service, was launched recently at Quality Shipyards in Houma, La. With an overall length of 222 feet, beam of 46 feet, and depth of 20 feet, the U.S.-flag vessel is one of the largest in the offshore marine service industry.

The new vessel's innovative "father/son" propulsion engine system features four Stork-Werkspoor diesels of two different sizes for maximum power, fuel efficiency, and reliability. The engines are SWDiesel's 8SW280, each developing 3,200 bhp at 1,000 rpm; and two 6SW280 models each developing 2,400 bhp at 1,000 rpm. When needed for heavy-duty anchor-handling and towing duties, the full output of 11,200 bhp will be used. During normal supply functions, the vessel will operate on only two engines, reducing fuel consumption to the equivalent of a 3,000-bhp supply vessel.

The vessel is fitted with controllable-pitch propellers in nozzles, and a 720-hp bow thruster powered by a Detoit Diesel 16V-92 engine. Twin Becker rudders are operated independently for better maneuverability and station-keeping.

The Gulf Service is powered and equipped to moor new-generation semisubmersible rigs as far north as 60 degrees latitude in the Bering Sea. Certified to Ice Class A by the American Bureau of Shipping, she is built with special ice-strengthening said to exceed that of any other U.S.-flag, anchor-handling tug/supply vessel.

The anchor-handling system minimizes rig mooring time and enables the vessel to transfer the rig's mooring system. The vessel's system includes chain lockers and pendant storage reels, with the capacity to store more than 12,000 feet of 3-inch anchor chain and 12,000 feet of 2½-inch pendant wire.

The towing winch is a Fritz-Culver low-pressure, hydraulic, double-drum waterfall type, with 586,000 pounds of line pull at stall, and capacity for 5,900 feet of 2½-inch cable on each drum. Other deck machinery includes two 10-ton, electro-hydraulic tuggers above deck and two 5-ton units below deck, and two 10-ton hydraulic capstans.

With a fleet of 325 vessels, Zapata Gulf Marine Corporation is the largest operator of oilfield service boats in the world. The Zapata fleet includes 89 tugs, 196 supply and tug/supply boats, 18 barges, and 22 utility and crewboats. Zapata Gulf was formed in November 1984 through the consolidation of the marine service fleets and related assets of Zapata Marine Service, Gulf Fleet Marine Corporation, and Jackson Marine Corporation.

Robertson Introduces New Small Commercial Autopilot

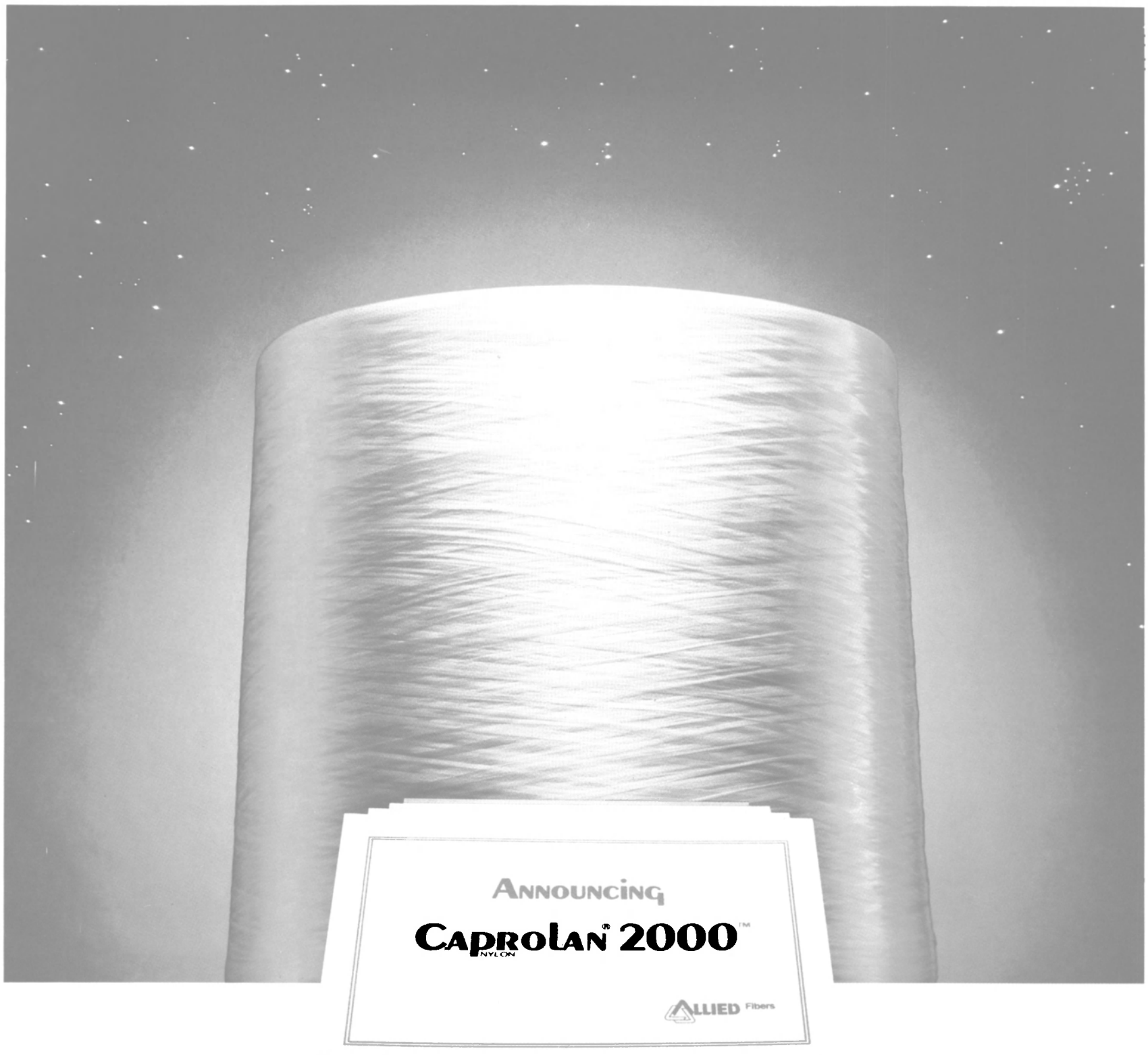
Robertson has announced a new addition to its microprocessor controlled autopilot family—the AP40. This pilot offers extremely simple, yet highly accurate, steering control for most commercial vessels and large yachts. Robertson reports the AP40 design eliminates the need to individually set controls for rudder, counter rudder, etc., which can be a complex operation depending on vessel characteristics. Instead, a single pushbutton control selects one of the nine preprogrammed steering models which most accurately matches a particular vessel's characteristics.

The AP40 can additionally accept up to three "personalized" programs set up during sea trials to meet a vessel's special needs. The AP40 also features Robertson's predictive rudder control system, originally introduced with the top of the line AP9, which provides superior steering accuracy by "learning" actual vessel rudder response to steering commands, thereby virtually eliminating rudder overshoot. As with Robertson's popular AP100DL and AP9 autopilots, the AP40 includes Loran C interface as a standard feature.

The AP40, like all the new Robertson pilots, displays pertinent data on two large LCD's, one giving system status information, the other showing a digital course readout. The AP40 operates with virtually any magnetic or fluxgate compass and has built-in offcourse alarm and rate-of-turn control. It is ideal for both new vessel installations and retrofits. Options include remote controls, watch alarm and rudder angle indicators.

For a full color brochure on the new Robertson AP40,

Circle 11 on Reader Service Card



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Watch for further announcements in major trade publications.

ALLIED Fibers

Halter Launches Rocket Booster Recovery Vessel 'Independence'

Jack Edwards, president of Halter Marine, has announced the recent launching of the solid rocket booster recovery vessel Independence at its Moss Point, Miss., yard. The 200-foot vessel will perform the key role in the recovery of rocket boosters launched from Vandenberg Air Force Base in California as part of the space shuttle program.

Retrieval vessel Independence is launched at Halter Marine's Moss Point shipyard.

Participating in the launching ceremony as principal speaker was Maj. Gen. **Donald W. Henderson,** the officer in charge of the Air Force's Shuttle Program. His wife, **Dawn E. Henderson,** christened the vessel.

The twin-screw vessel is propelled by two Cummins KTA-3067-M 16-cylinder diesel engines, each with an output of 1,250 bhp at 1,800 rpm. She is fully equipped to handle all necessary diving evolutions, with complete diving equipment, air refilling systems, and a hyperbaric chamber for decompression. Bow and stern thrusters will be used for propulsion for safety when divers are in the water. A complete electronics system for navigation, communications, and for locating and recovering the rocket boosters will be installed.

The Independence is being built by Halter under a contract from Lockheed Shipbuilding. The Lockheed Space and Operations Company will take delivery of the vessel, which will be operated for Lockheed by Morton Thiokol. Delivery is scheduled for May this year.

Gen. **Henderson** stated that the solid rocket booster recovery process is a "prime example of designed-in cost avoidance that contributes substantially to providing an affordable launch system. A new set of solid rocket boosters costs $67 million. The retrieval and refurbishment cuts that cost to $22 million, a net saving of $45 million per mission. The Independence may well pay back its costs in the first few missions."

Sponsor of the Independence was **Mrs. Dawn E. Henderson,** wife of Maj. Gen. **Donald W. Henderson;** looking on, officer in charge of the Air Force's Space Shuttle Program. At right is Halter president **Jack Edwards.**

He then went on to praise the Lockheed/Halter team responsible for the Independence, in particular the shipyard at Halter Marine's Moss Point yard for building the vessel on schedule and within budget.

Mr. **Edwards,** in his launching ceremony address, said that the performance of the program to date is a tribute to the Lockheed and Halter team. He said that he was pleased that the Moss Point yard once again demonstrated its superb performance by building a vessel of outstanding quality and meeting the rigorous schedule required to deliver the Independence on schedule.

The Independence is expected to participate in the first space shuttle launch from the Vandenburg site, which is scheduled for early 1986.

Independence Suppliers' List

Main engines (2)	Cummins
Reduction gears (2)	Niigata
Propellers (2)	Lips
Engine controls	Wabco
Shafts	Halter
Shaft brakes	Mathers
Keel coolers	Fernstrum
Bow & stern thrusters	Elliot White Gill
Generators	KATO
Generator engines	Cummins
Firefighting system	Goulds
Emergency generator	Cummins
Towing winch & anchor windlass	HBL
Satnav & Loran systems	Magnavox
Position plotter	Decca
Radars (2)	Krupp Atlas
Echo depth sounder	Simrad
Auto direction finder	Simrad
Weather facsimile recorder	Alden
Speed log system	Junger
Satcom system	Magnavox
HF/SSB radio	King
VHF radio	Texas Instruments
Aircraft UHF transceiver	Magnavox
General-purpose receiver	Harris
Aircraft VHF radio	Narco
CB radio	General Electric
Hand-held VHF radio	Repco
Lifeboat radio	ITT Mackay

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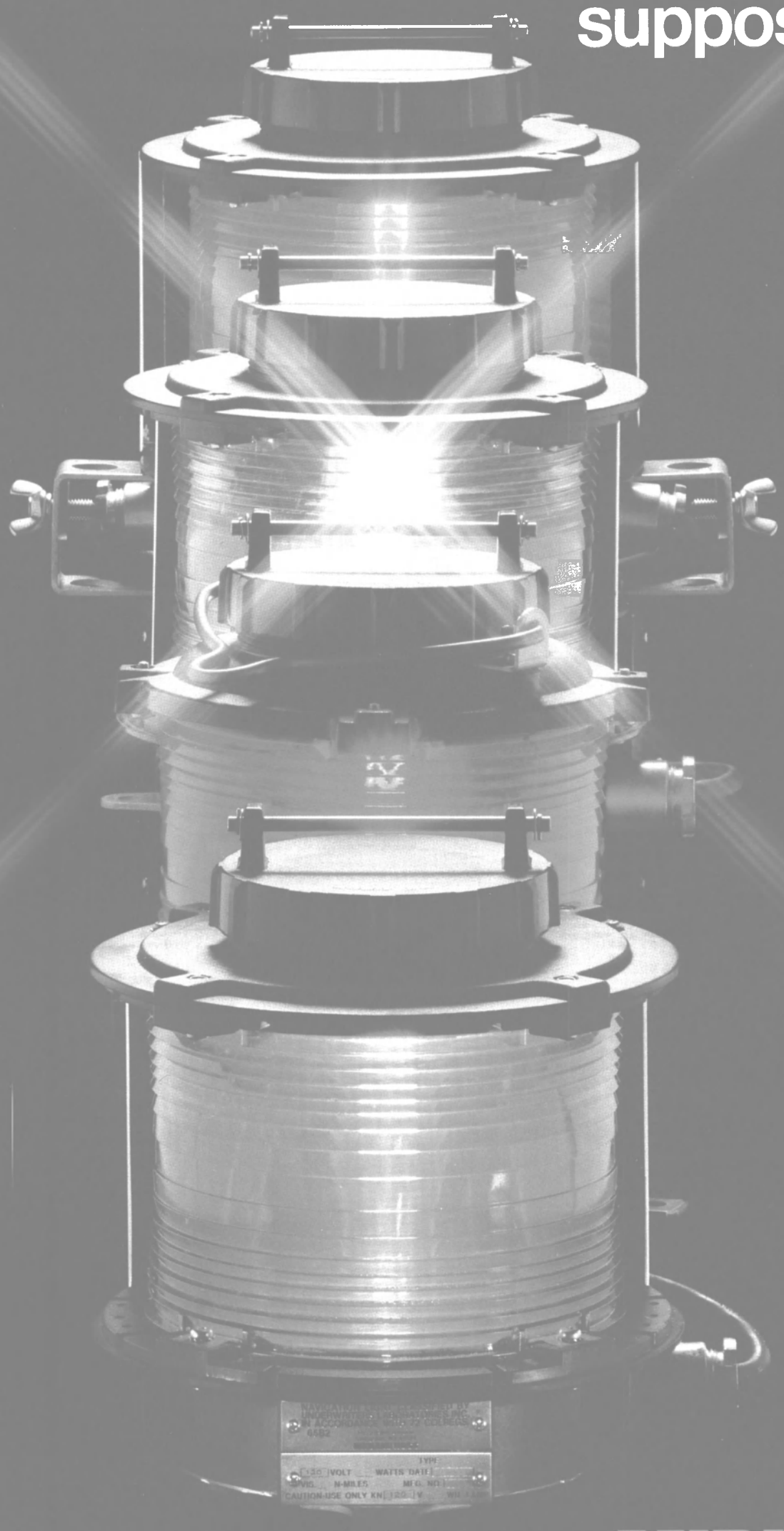

Maybe you expect navigation lamps to fail. After all, seaworthy vessels rock, shake and vibrate—and how much punishment can a lamp be expected to take? Chances are you just allow for the expense of breakage and a reduced safety factor while the lamps are out.

At Russellstoll, we don't think you should make such allowances—or waste your money. That's why we developed the new Long Life Lite.

It's actually a complete new family of navigation lights with a shock- and vibration-proof lamp holder that extends lamp life dramatically because it reduces the chance of failure due to external vibration or shock. *No competitive navigation light offers this protection.*

An unbroken list of benefits.
The lamp holder features a tight rubber gasket that lets the lamp reach its rated life, saving you time and money. What's more, the Long Life Lite is dust-tight and water-proof so it resists the direct spray of seawater under pressure.

From the lightweight polyester housing that resists temperature extremes to a virtually unbreakable polycarbonate lens that fights off saltwater, the Long Life Lite is a study in smart design. Even down to the smaller details, such as our brass fittings and mounting plates.

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The Long Life Lite has been thoroughly tested and meets all international regulations. It's U.S. Coast Guard approved. Previously, only one other navigation light was rated acceptable by 72 COLREGS.

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Circle 175 on Reader Service Card

Radio Technical Commission For Maritime Services Annual Meeting

San Diego, April 29–May 2

The 1985 Annual Meeting of the Radio Technical Commission for Maritime Services (RTCM) will be held Monday, April 29, through Thursday, May 2, at the Holiday Inn at the Embarcadero in San Diego. The reception desk will open from 4 to 8 pm on April 29, and a Welcome Reception sponsored by the 1985 RTCM Booster Club will take place from 6:30 to 8:30 pm.

Keynote luncheon speaker on April 30 will be **Walter W. White,**, chief engineer of the Long Beach Harbor Department. No luncheon is planned for May 1; the speaker on May 2 will be Cdr. **Cedric C. Wake-Walker,**, secretary general, Comite International Radio Maritime (CIRM). Wednesday from 6:30 to 11:00 pm RTCM members and guests will spend a nautical evening aboard the luxurious Berkley, berthed on the San Diego waterfront opposite the Holdiay Inn. Operated by the Maritime Museum of San Diego, this beautifully restored vessel reflects the ambiance of the turn of the century when she was used to ferry passengers across San Francisco Bay. Evening activities will include a tour of the Maritime Museum, social hour, buffet dinner, and dancing.

An attractive tour program has been planned for April 30 and May 2. Tuesday will be filled with the sites and sounds of San Diego at its best. The tour starts with a visit to Balboa Park, home of two world's fairs, then on to Old Town, one of the first Spanish settlements. Following "on-your-own" lunch, the tour will visit Seaport Village, a shopping complex with a variety of specialty shops.

Thursday's tour of the La Jolla area will begin with a stop at Scripps Institute of Oceanography, followed by time for shopping in the quaint village of La Jolla, known for its boutiques, import shops, and gourmet restaurants. To complete the tour, luncheon is included at the beautiful Marine Room restaurant overlooking the Pacific Ocean.

Tuesday, April 30

8:00 am to 4:00 pm—Registration desk open

9:00-10:15—Annual Business Meeting

10:15-10:30—Coffee Break

10:30-11:45—Session I

Moderator: **L.R. Raish**, Fletcher, Heald & Hildreth

"The Changing Regulatory Environment," by **Raymond A. Kowalski**, U.S. Federal Communications Commission

"Federal Government Policy on Radionavigation—What It Means to the Mariner," by **David C. Scull**, Research and Special Programs Administration, U.S. Department of Transportation

"Communications and the New Ready Reserve Force," by **James C. McCoy Jr.**, Maritime Administration, U.S. Department of Transportation

12:15-2:15 pm—Luncheon

Keynote speaker: **Walter W. White**, chief engineer, Long Beach Harbor Department

2:30-5:30—Session II

Moderator: **Charles S. Carney**, National Marine Electronics Association

"Mariner Reports (MAREP)," by **Robert C. Landis** and **Paul A. Jacobs**, National Weather Service, NOAA, U.S. Department of Commerce

"INMARSAT—The Coming of Age," by **George Tellman**, Comsat World Systems Division

"On-Board Access to Near-Real Time Marine Information," by **Richard G. Johnson**, Oceanroutes, Inc.

"Digital Ship-to-Shore Communications in Support of Fuel and Traffic Management Along the Inland Waterways," by **Edward J. Bender**, Dundics' Enterprises, Inc.

"RCA Global Automation of Coast Stations," by **David Kintzer**, RCA Global Communications, Inc.

"Processor-Controlled Shipboard Radio Station Providing Both Attended or Fully Automatic Unattended Operation," by **Gary W. Jones**, Rockwell International Corporation

"The Impact of GPS on Marine Navigation," by **Ralph F. Eschenbach**, Trimble Navigation

"GPS Navigator," by **Genichiro Tomioka** and **Koji Yamada**, Japan Radio Company, Ltd.

Wednesday, May 1

8:30 am-12:30 pm—Registration desk open

9:00-11:30—Session III

Moderator: **John C. Fuechsel**, National Ocean Industries Association

"Implementation of the Future Global Maritime Distress and Safety System in the U.S. Coast Guard," by Lt. **Steven P. Wolf,** USCG, and **Dennis L. Lengyel**, ARINC Research Corporation

"Digital Selcal," by **John E. Spragge**, Harris Corportion

"U.S. Coast Guard Planning for Implementation of Digital Selective Calling for Use in the FGMDSS," by **Richard Swanson**, USCG

"Automatic Distress Recording System," by **Don Derryberry**, Exxon Company, USA

"Role of the Radio Operator in the Future Global Maritime Distress and Safety System," by **William A. Luther**, U.S. Federal Communications Commission

"Reliability, Availability, and Repairability of Shipboard Electronics PC Boards," by **Rae A. Echols Jr.**, ARA-TIME Department of MITAGS

Panel Discussion—Problems and Opportunities Associated with Implementation of the FGMDSS—session participants and others

11:30-1:30—Lunch break

1:30-5:30—Session IV

Moderator: **Thomas E. McGunigal**, U.S. National Aeronautics and Space Administration

"An Overview of Emergency Position-Indicating Radiobeacons Operating Through Space Systems," by **Thomas E. McGunigal,** NASA

"Distress Beacons—Present and Future" by **David J. Haykin Jr.**, NASA, et al

"COSPAS/SARSAT—A Space System for the Search and Rescue of Lives in Distress," by **Fred S. Flatow,** NASA; **James T. Bailey**, NOAA; and **Wayne A. Hembree**, NASA

"The CCIR-Recommended Satellite EPIRB System Operating Through Geostationary Satellites of 1.6 GHz," by **Hans Kesenheimer**, Dornier System GmhH, and Dr. **Walter Goebel**, German Aerospace Research Establishment, Institute for Telecommunications

"Rapid Search and Rescue Alerts Using Geostationary Satellites with COSPAS/SARSAT EPIRBS," by **Morton L. Feiedman**, NASA, et al

"COSPAS/SARSAT Potential for the FGMDSS," by **B. Lee Anstey**, Canadian National Defence Headquarters.

Panel Discussion—The Future World of Space-Based EPIRB Systems—session participants and others

Thursday, May 2

8:30-10:30 am—Registration desk open

9:00-11:00—Session V

Moderator: **Samuel W. McCandless Jr.**, User Systems, Inc.

"The Upcoming Riches in Marine Data," by **Samuel W. McCandless**

"NOAA's Ocean Service Center Program," by **Donald R. Montgomery**, National Ocean Service, NOAA

"Remote Sensing and the Fishing Industry" by Dr. **Michael Laurs**, U.S. Department of Commerce, NOAA

"Arctic Operations and Remote Sensing," by Dr. **Robert Thomas**, NASA

"Applying Remote Sensing Techniques to the Marine Environment," by **David E. Lichy**, U.S. Army Corps of Engineers

Panel Discussion—The Future of Remote Sensing and Marine Commerce—session participants and others

Noon-2:00 pm—International Luncheon

Speaker: Cdr. **Cedric C. Wake-Walker**, secretary general, Comite International Radio Maritime (CIRM)

2:15-5:30—Session VI

Moderator: **H.T. Blaker**, Rockwell International Corporation

"Yagi Type Polarization-Controlling Antennas for Maritime Satellite Communication," by **Shigeru Okubo** and **Shinobu Tokumaru**, Keio University; **Yasuhiro Kazama** and **Masanobu Okuyama**, Japan Radio Company, Ltd.

"Group Calling Made Easy," by **John C. Bell**, International Maritime Satellite Organization (INMARSAT)

"An Enhanced Group Call Receiver," by **John M. Smith**, Magnavox Advanced Products and Systems Company

Demonstration of an Enhanced Group Call Receiver

"Recent Developments in Offshore Navigation and Observation Systems," by **Jan W. Mantel**, Radio Holland B.V., and **Willem G. Pullen**, Philips USFA B.V.

"Skylink Mobile Satellite Service," by **S. Terrell Quillian,** Skylink Corporation

"Progress on the Geostar Satellite System," by **Gerard K. O'Neill**, Geostar Corporation

"Ambiguities in Radar Identification by Frequency," by Dr. **W. Richard Klein** and **David C. Tigwell**, Tideland Signal Corporation

5:20-5:30 pm—Closing remarks

For additional information on the RTCM meeting or tour program, call or write Radio Technical Commission for Maritime Services, 655 15th Street, N.W., Suite 300, Washington, D.C. 20005; (202) 639-4006.

Tug Fleet Owner And Operator Bart Turecamo Dies At Age Of 64

Bart Turecamo

Bart Turecamo, who owned and operated a fleet of 22 tugs and barges along the East Coast, died recently on his boat in Palm Beach, Fla. He was 64 years old.

Mr. **Turecamo** oversaw the growth of his family-owned business from a fleet of three boats to 19 tugs based in New York and Charleston, S.C. He had a reputation as a hard-driving, dedicated businessman who grew up on the tugs, serving as a licensed captain, and eventually became the chief executive officer of Turecamo Coastal & Harbor Towing Corporation.

Mr. **Turecamo** stepped down from the presidency in 1982 after suffering a stroke that left him partially paralyzed but with his sense of humor intact. He has been serving as chairman of the board for the past 2½ years. In addition to his business activities, he has been a major fund raiser for St. Francis Hospital in Roslyn, N.Y., and has served as vice president of the Italian Seaman's Club of New York.

He is survived by his wife **Jean,** and six children: **Helen Jean Newman, Kathleen Nistad, Joan McGinty, Bart Turecamo, Mary DiGiovanni**, and **Margaret Turecamo**. Also, a brother **Vincent Turecamo**, and sister **Frances Dwyer**, and 11 grandchildren.

New Product Brochures Offered By Armco

A stainless steel that wins the war against corrosion in the oilfields and another that fights wear at an affordable price are featured in two new product data bulletins on Nitronic 50 and 60 available from Armco's Specialty Steels Division.

Nitronic 50 provides corrosion resistance and high yield strength not found in any other corrosion-fighting material in its price range, according to the bulletin. Oilfield applications of Nitronic 50 are listed for use offshore or on land. It is said to be ideal in applications that require a combination of resistance to corrosion, heat, and pressure. A chart is included that shows test results of the alloy's resistance to sulfide stress cracking in sour wells.

Nitronic 60 wears up to three times longer than high-cobalt alloys in oilfield applications but costs much less, the other bulletin says. Nitronic 60 can be used anywhere in oilfield equipment where metal meets metal. It will provide resistance to wear and add years of service to the equipment, the bulletin says. A chart and photo are included that show how this alloy outwears competitive materials.

For free copies of the bulletins or more information,

Circle 20 on Reader Service Card

PRMMI Purchased By TNT Containerships— Toomey Named President

Esteban Davila, executive director of the Puerto Rico Maritime Shipping Authority (PRMSA) and **John R. Arwood**, president and chief executive officer of TNT Containerships, Inc. jointly announced the recent purchase by TNT Containerships, Inc. of all the shares of stock of Puerto Rico Marine Management, Inc. (PRMMI). At the same time a contract was executed whereby PRMMI will manage and operate the shipping services of the Authority (PRSMA).

Mr. **Arwood** announced the appointment of **Gerald P. Toomey** as president of PRMMI.

Fibergrate Introduces New Fibertred FRP Stair Tread Panels—Literature Offered

Fibergrate Corp. of Dallas, Texas, is offering literature on the innovative new Fibertred stair-step panels that are produced by the company.

According to the manufacturer, eight of industry's most popular-size stair treads (30 inches by 10½ inches) can now be cut out of each all-new Fibertred FRP stair tread panel with no loss of material, and at a per-step cost saving of around 45 percent over single tread purchases. Corrosion-resistant Fibertred panels, made with fiberglass reinforced plastic, are said to be 50 percent stiffer, fire-retardant, impact-resistant, and electrically nonconductive. This unique panel construction makes it equally easy to yield all eight of industry's preferred tread sizes: widths 24 inches, 30 inches, 36 inches, and 42 inches in both 9- and 10½-inch depths.

Fibertred panels measure 10 feet by 22½ inches, being specially engineered for no-loss, error-free cutting in 6-inch width increments, using a rotary handsaw equipped with a masonry blade that slices efficiently between the special double-bar construction, resulting in no-waste closed-end treads, ready to install.

Tread mesh is 1½ inches by 6 inches, and the 1½-inch thick panel is made with two anti-slip nosing bars along both edges of the 10-foot panel length. For optimum safety, Fibertred panels are manufactured with grit-impregnated nosing designed to meet OSHA standards.

Fibertred stair-step panels are available in all the same resin systems that comprise the universally accepted Fibergrate grating line. They include the orange Type D-

411 vinyl ester resin; gray Type CFR-197 polyester resin; green IFR-67 isophthalic polyester resin; and gray XFR-92 polyester resin with antimony oxide added for maximum fire resistance. All fibertred panels are fire-retardant to meet Class 1 flame-spread classification standards, providing zero fuel contribution. All are dielectric, and are said to be more impact-resistant than galvanized iron or aluminum grating stair treads.

For full information and literature on Fibertred panels from Fibergrate Corp.,

Circle 28 on Reader Service Card

Promotions Announced By Woodward-Clyde

Woodward-Clyde Oceaneering has announced the promotions of Dr. **Edward Owens** to vice president and general manager and Dr. **Thomas Whelan III** to vice president and chief geochemist. Both Dr. **Owens** and Dr. **Whelan** will be located in the Houston office.

Dr. **Owens** was previously manager of European and Scandinavian operations for the company. Before joining Woodward-Clyde Oceaneering he was with the Coastal Studies Institute of Louisiana State University and the Geological Survey of Canada. He received his Doctorate from the University of South Carolina.

Dr. **Whelan** has been responsible for the development of geochemical exploration techniques within Woodward-Clyde Oceaneering and has extensive experience in conducting geochemistry studies. Prior to joining Woodward-Clyde Oceaneering in 1981, he worked with Carbon Systems Inc. and was on the faculty of Louisiana State University. Dr. **Whelan** received his Doctorate in Chemical Oceanography from Texas A & M University.

MarineSafety International VHS Tapes Illustrate Simulator Training —Literature Available

Two short videotapes produced by MarineSafety International, New York, N.Y., provide shipowners and operators with an insight into the cost-effectiveness of simulator training. Emergency situations both on a ship's bridge and in the engine room are illustrated by the ten-minute tapes.

To illustrate the value of a full-mission simulator in practicing maneuvering decisions, a typical simulator exercise was taped using actual officers in training. A shipowner can easily see how this advanced form of training can pay off and help officers avert costly mistakes.

A simulator exercise for engineers illustrates clearly how technical awareness and experience in reacting can be gained in a simulator.

For further information on these tapes from MarineSafety International,

Circle 14 on Reader Service Card

Bardex Hydranautics To Provide Rig Skidding System For East Zeit

Bardex Hydranautics has received a contract from the Turmeric Division of Braham Industries in Great Yarmouth, U.K., for a rig skidding system for use on the East Zeit platform in the Gulf of Suez.

The system consists of master skid and substructure hydraulic gripper jacks plus a power-control unit.

Bardex Hydranautics is headquartered in Goleta, Calif., with offices in London, Singapore and Houston. The company designs and manufactures heavyload moving equipment for offshore and shipyard-related activities, including systems for applications ranging in size to over 50,000 tons.

For free literature on Bardex's equipment and systems,

Circle 12 on Reader Service Card

Allied Introduces New Super-Strength Fiber —Literature Available

Spectra-900™, a high-performance fiber that is said to be the strongest fiber pound-for-pound ever made, was recently introduced by Allied Corporation of Morristown, N.J. A super-tough polymer fiber, Spectra-900 was invented in Allied's Corporate Research Laboratories in Morris Township, N.J., and is being developed and marketed by the Fibers Division of the company's Chemical Sector in Petersburg, Va.

"This polyethylene fiber is 30 to 50 percent stronger than its nearest rival, aramid fiber," **James J. Dunbar**, general manager of the Spectra-900 Group, remarked. (The total market for aramid and graphite fibers, Spectra-900's direct competitors, is approximately $300 million.)

Dr. **L. James Colby Jr.**, Allied senior vice president-technology, noted that Spectra-900 is "just the first in a series of extended chain polymer fibers we expect to introduce. The evolution of this product from lab to marketplace is an excellent example of successful cooperation between scientists and business managers."

In addition to being strong, Spectra-900 is lightweight (it floats), abrasion resistant, very tough, and has low sensitivity to moisture. The product was introduced to the commercial and pleasure boat markets at the recent Miami Boat Show. Its first commercial application for these industries is in braided ropes, cordage and sails. "Spectra-900 high performance sails made by Howe and Bainbridge are represented in the races in Miami," Mr. **Dunbar** noted. Samson Ocean Systems has taken this fiber and made it into XLS-900 rope for commercial marine use that it calls the "new generation double braid."

Based on an ultra-high-molecular-weight polyethylene, Spectra-900 is made by an Allied gel-spinning process that produces an extended chain polymer that takes advantage of the inherent strength of the polyethylene molecule. The fiber can be used alone, and the technology also holds promise for use with other polymers as well. Two new fibers are already under development. Eventually the company will supply a wide range of gel-spun fibers offering combinations of properties and deniers tailored to specific end-use applications.

Hybrid composites will also be used to tailor end-use properties even more closely. A graphite/Spectra-900 composite, for instance, would benefit from the very high impact strength of the Spectra-900 and the very high modulus of the graphite. Allied sees aircraft/aerospace applications for this hybrid, providing that end-use temperatures are acceptable. Spectra-900's major limitation is its melting point of 150 C.

Spectra-900 can also be used in combination with aramid and glass fibers. Additional options being explored include foam composites and honeycombs for products requiring increased rigidity.

Spectra-900's unique properties make it suitable for a number of applications, including: Hard and Soft Ballistics—body armor fabrics, helmets, rigid armor composites, rocket casings, pressure vessels, and radomes; Industrial—conveyor belts, hoses, netting, webbing, communication and power cable reinforcement and composites; Medical—artificial joints, limbs, ligaments, implants and prostheses; Sporting Equipment—helmets, skis, sailboards, bicycles, gliders, ultra-light aircraft, fishing rods and racquets; Composites—reinforcing fiber in filament winding, hand lay-up and vacuum bag molding; Petroleum—geotextiles, oil recovery booms, oil-rig riser tensioner systems and flexible pipe reinforcement.

Currently, one grade of Spectra-900 is available—a 1200 denier fiber in developmental quantities at $22 a pound for high performance sails and marine ropes. "We are now in the pilot plant stages of production, but have begun design on a commercial facility at a location where Allied already turns out industrial fibers," Mr. **Dunbar** commented.

For further information and free literature on Allied Corporation's Spectra-900,

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DE-MAR® MDX: Fuel-saving diesel engine oil with a 20-year reputation for top performance.

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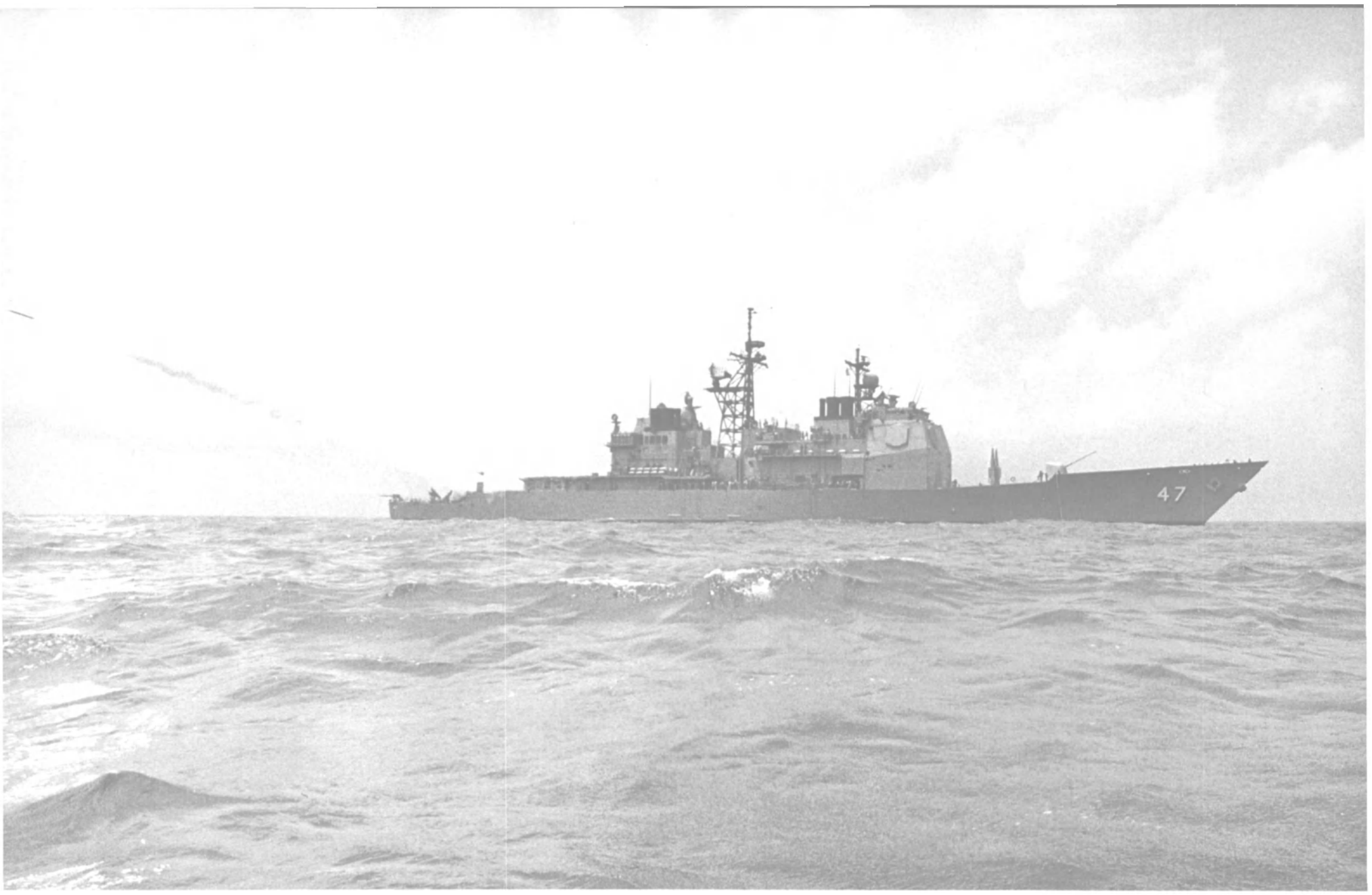

USS Ticonderoga

ASNE DAY '85

Washington, DC—May 2-3

The American Society of Naval Engineers will hold ASNE Day 1985 at the Shoreham Hotel in Washington, D.C., on May 2-3. The theme for this year's meeting is "Capability Versus Cost—The Naval Engineer's Challenge." ASNE Day is the 97-year-old Society's annual national convention, featuring technical sessions, exhibits, and social functions.

The two-day meeting will include technical papers on subjects of current interest, such as ship design, combat systems, ship auxiliary systems, naval architecture, ship propulsion, seakeeping, high-performance craft, and energy conservation.

More than 150 companies, military commands, and other organizations will display their products and capabilities. These exhibits will represent the latest in the industry and technology that supports the development, construction, and outfitting of military and commercial ships. Also represented will be the military commands and laboratories that interface with the industrial community and direct the programs and projects engaged in expanding and modernizing the U.S. Navy Fleet.

A highlight of the ASNE Day is the banquet on the evening of Friday, May 3. This year's banquet speaker will be Vadm. **William H. Rowden**, Commander, Military Sealift Command, Department of the Navy.

TECHNICAL PROGRAM
Thursday, May 2

Palladian Room—Session 1A
Ship Design I

Moderator:
Como. **Myron V. Ricketts**, USN

Edward N. Comstock, assistant

ON TIME WHEN TIME COUNTS . . .

USNS Algol (T-AKR—287), first of three Fast Logistic Support Ships after conversion at NASSCO for the U.S. Navy, underway at more than 33 knots.

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WHATEVER IT TAKES

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ASNE Day

(continued)

9:00 am

"A Fast Combatant Support Ship," by **Philip M. Covich**

This paper presents the evolution of the latest generation of fast combatant support ships, and reviews the approach taken in developing the requirements and the design. It also describes the role the Ships Characteristics Improvement Board played in the design, the deep involvement of the fleet in the generation of the requirements and in the review of the design itself, and the involvement of the industry in the design.

The paper concludes with a detailed discussion of the innovative systems included in the design, such as the upgraded General Electric LM2500 gas turbine, and the special features incorporated to satisfy the latest airborne noise-quieting features. Efforts taken to insure the successful implementation of the new concepts or systems are also outlined.

9:45 am

"Naval Ship Design: The Shipbuilder's Emerging Role," by **Robert A. Johnson**

This paper discusses the shipbuilder's new role in naval surface combatant design. It discusses two recent designs in which shipbuilders have been involved extensively in the early design stages. The acquisition strategy for the MSH program directed that competing shipbuilders totally develop designs for the concept, preliminary, and design concept stages. In the second example, a recent destroyer design is used to illustrate a totally different acquisition strategy—that of an in-house design with a traditional lead-ship award selection.

10:30 am

"Modernization of the Barque Eagle," by **Nien-tszr Tsai, Eugene C. Haciski**, and Lcdr. **Joseph J. Kucinski**, USCG

The U.S. Coast Guard training barque Eagle (WIX-327), ex Horst Wessel, was built in 1936 by Blohm + Voss for the German Navy. Since 1936 she has served continuously as the training vessel for the U.S. Coast Guard. To improve safety and performance, an extensive phased modernization was undertaken from 1979 through 1983 at the Coast Guard Yard. Changes in the subdivision, ballast, and tankages were made to satisfy the criteria for two-compartment damage stability. Extensive renovations of machinery, structure, navigation components, and habitability were also accomplished during the same period.

Diplomat Room—Session 1B
Ship Auxiliary Systems

Moderator:
Paul A. Schneider
Thomas H. Vodicka, assistant

9:00 am

"New Electric Motor-Driven Vapor Compression Distilling Plant for Navy Surface Ships," by **Charles D. Rose, James C. Heck,** and **William F. Pergande**

This paper describes vapor compression distillation, reviews the process flow diagram and distillation cycle, and presents a brief history of vapor compression distillation. It discusses initial problems, advantages, and disadvantages, along with recent technological improvements. It also reviews the vapor compression plant specified for the DDG-51 program and the specific units tested and installed aboard the USS Foster (DD-964) and USS Thorn (DD998), along with a complete description of the major components and their functions.

9:45 am

"Abatement of Pollution from U.S. Navy Ships—the First Ten Years," by **Andrew T. Geyer** and **James A. Spence Jr.**

The early 1970s saw the evolution of an aggressive naval research and development program in the area of shipboard pollution control. Early efforts focused on the development of flow-through type marine sanitation devices (MSD). However, available commercial technology could not produce a reliable and easily maintainable MSD that was capable of consistently meeting the effluent discharge requirements established by the Coast Guard.

Anticipating the compliance date of the Federal Water Pollution Control Act, the Navy committed to

installing a collection, holding, and transfer (CHT) system on board most of its vessels. Between 1973 and 1983, more than 430 ships and 400 small craft had been fitted with MSDs. In addition, 53 Navy ships have had a state-of-the-art oily waste treatment system installed in anticipation of future requirements.

10:30 am

"Navy Air Compressors—Past, Present, and Future," by **Joel L. Krinsky, Harry J. Skruch**, and **William H. Vedder**

As part of a program to improve shipboard air compressor reliability, NAVSEA and DTNSRDC are developing a new generation of rotary machines to replace ships service reciprocating piston air compressors with new, smaller, lighter, more reliable models.

The successful development of completely water flooded, 125-psi air compressor units by DTNSRDC resulted in the award of a four-phase contract by NAVSEA to a compressor manufacturer to design, build, and test low- and high-pressure shipboard prototypes.

Palladian Room—Session 2A
Naval Architecture

Moderator:
Capt. **George H. Moritz**, USCG
Robert E. Williams, assistant

2:30 pm

"Reliability Methods for Ship Structures," by **Gregory J. White** and Dr. **Bilal M. Ayyub**

The ever-increasing use of high-strength materials and advanced technologies in surface ship structure design requires a careful and systematic analysis to insure that levels of safety are maintained. Due to the uncertainties involved with future loading conditions, material properties, quality of workmanship in construction, and the limitations in numerical methods of analysis, the absolute safety of a structure cannot be established.

This paper evaluates the available methods as to their suitability for estimating the risk of structural failure in ships. It discusses the merits and shortcomings of each method, and each is then used to solve a simple example problem. The most effective method is chosen for more advanced work in this field.

3:15 pm

"An Analytical Treatment of the Accuracy of the Results of the Inclining Experiment," by **Erik O. Hansen**

This paper compares U.S. Navy inclining procedures and those recommended by the U.S. Coast Guard for accuracy of resultant light ship displacement and VCG values. It discusses the errors of the independent parameters, and presents a numerical example of an analysis of an actual ship inclining to demonstrate how much the deviation of the individual parameters affects the accuracy of the inclining result. The paper concludes by suggesting the magnitudes of design allowances required on displacement and VCG in order to account for the probable inaccuracy in the experimentally derived displacement and VCG values.

4:00 pm

"Probabilistic Design Techniques for Space Limited Mechanical Elements," by **Morris Welling** and **John Lynch**

A too-little-known stress analysis technique is applied to the design of a titanium tension member of a sonar array, in a situation where space limitations preclude the application of the conventional factor of safety. The computed safety factor for the critical section in this instance is a normally unacceptable 1.42, based on the tensile yield point, and is only slightly higher based on the ultimate tensile strength.

This paper discusses the significance of the reliability value vis-a-vis the "factor of safety" design approach, as well as the limitations involved. It offers guidance for establishing overall reliability goals for a unit or assembly with several significantly stressed sections.

Diplomat Room—Session 2B
Ship Propulsion

Moderator:
Anthony A. St. George

(continued on page 34)

ASNE Day

Capt. **Gilbert L. Kraine**, USCG (Ret.), assistant

Lcdr. **John H. Preisel**, USN, assistant

2:30 pm

"Automation of Propeller Inspection and Finishing," by **Howard Stern** and **Robert Metzger**

U.S. Navy ships' propellers of up to 24 feet in diameter and weighing up to 100,000 pounds are currently measured by manual procedures using pitchometers, templates, and gauges. This measurement process is extremely tedious, labor-intensive, and time-consuming, and only sparse surface data is obtained.

In an effort to provide increased accuracy, repeatability, and cost-effectiveness in propeller manufacture, the Navy has contracted for an automated propeller optical measurement system (APOMS) that rapidly and automatically scans an entire ship's propeller using a 3-D vision sensor to provide data densities greater than 100 points per square inch.

This equipment is integrated with a propeller robotic automated templating system (PRATS) and the propeller optical finishing system (PROFS), which automatically template and grind the propeller to its final shape using the APOMS-derived data for control feedback. The optical scanning and the final shape are both controlled by CAD/CAM data files describing the desired propeller shape. An automated propeller balancing system is incorporated into the PROFS equipment.

3:15 pm

"Naval Propulsion Systems Water Treatment and Control," by **Bernadette J. Eichinger**

This paper briefly describes the causes and effects of corrosion and contamination in conventional steam generator systems, and details treatment and control methodologies currently used by the Navy for the feedwater, steam, condensate, and boiler water. Examples are cited of the manner in which naval personnel are trained in interpretation of analytical data and in trend analysis in order that the ship can exercise preventive and corrective control of problems. The paper concludes with an overview of planned improvements.

4:00 pm

"The Machinery Alteration Program," **A.M. Cieri** and Cdr. **L.H. Kenney**, USN

This paper describes how the Navy's machinery alteration (MACHALT) program addresses the problem of a whole class of needed design changes with no programmatic means of accomplishing them for ship systems. MACHALTs are design changes to equipments that do not require system interface changes and that can be accomplished outside the industrial activities. The paper also discusses how the concept was developed, the study of other system modification processes that were used for guidance, examples of problems, and how the MACHALT process solves these problems. The paper concludes with an assessment of the program to date.

Friday, May 3
Palladian Room—Session 3A
Ship Design II

Moderator:

Capt. **Warren G. Leback**, USMS

Capt. **James W. Kehoe Jr.**, USN (Ret.), assistant

9:30 am

"The Impact of Zone Outfitting on Shipboard Space Utilization and Construction Costs," by Cdr. **Stanley C. Stumbo**, USN (Ret.)

The methods of zone, rather than system-oriented design and construction methods, were principally developed to improve productivity through the application of group technology. However, experience in the U.S. is indicating that these methods are also resulting in unexpectedly high savings in material and weight as well as labor costs, leading to total ship construction cost savings of up to 30 percent.

This paper describes a three-dimensional approach to the use of enclosed volume. It highlights the remarkable improvements and options in the use of space and the reduction in construction costs that can result from using the zone outfitting methods in warship design and construction instead of conventional system-oriented methods.

10:15 am

"Merchant Ship Design for National Defense," by **John W. Boylston**

In the 1960s and 1970s, U.S. shipowners constructed a high percentage of special-purpose vessels such as LASH, Seabee, containerships and RO/ROs. Today, some of those ships have not lived up to the full economic potential due to changing trade patterns. In some cases, with half of the vessel's economic life remaining and the high cost of conversion, lay-up may be the more attractive alternative for the shipowner.

This paper presents some examples of how the commercial ships can be designed for future mission changes, and introduces the concept of the national emergency economy defense (NEED) ship.

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11:00 am

"Reliability Allocation and Prediction for a Fully Distributed Ship Machinery Control System," by **Jeannine A. Vail** and **Steven K. Klein**

This paper discusses a functional allocation of reliability requirements for a fully distributed machinery control system, using platform level availability and associated top level logistics requirements. The allocation approach chosen uses the number of signals required for a particular control or monitoring function as a measure of subsystem complexity.

The paper also predicts values obtained assuming various sparing levels, as well as system availability using U.S. Navy in-service equipment data and traditional Tiger simulation techniques to assess the realism of each approach.

Diplomat Room—Session 3B
Combat Systems I

Moderator:
Radm. **Wayne E. Meyer**, USN
Cdr. **William F. Bassett**, assistant

9:30 am

"MK 41 Vertical Launching System—Fleet Application," by Capt. **James J. Kuletz Jr.**, USN

The unique physical construction and launch control system architecture of the MK 41 vertical launching system (VLS) makes it particularly adaptable to a variety of missiles and ship classes. The U.S. Navy began installing the MK 41 VLS in deep-draft combatants early this year.

System attributes such as increased firepower, reduced manning and training requirements, high reliability, and low maintainability indicate the MK 41 will best answer the fleet's requirement for highly capable launchers at minimum life cycle cost. Several launcher variants can be readily configured from MK 41 launcher components.

10:15 am

"Shipboard Explosive Safety and Survivability," by Capt. **John H. Chenard**, Dr. **Glen R. Moore**, and **Micheal M. Kordich**

The Navy has recently completed development of a booster rocket motor, MK 70, for use with the new Standard missile. The new missile will be deployed on Terrier new threat upgrade (NTU) ships.

This paper describes the shipboard integration program directed by the Naval Sea Systems Command to insure that ship safety and survivability would not be degraded upon depolyment of SM-2 missiles with the MK 70 booster.

At-sea and land-based tests were conducted to evalutate missile launcher and ship compatability with the new missile system, and to insure increased operational capabilities. The results of these tests are described in this paper, along with the ship, launcher, and missile modifications determined necessary for the safe integration of the SM-2 into the Terrier ships.

11:00 am

"Special-Purpose and General-Purpose Programmable Signal Processors," by Dr. **Walter Weinstock**

The availability of high-performance, low-cost processing hardware provides the basis for very powerful programmable signal processing machines. A wide spectrum of machine architectures is available to the system designer. However, as these often have striking functional differences, the selection process must involve much more than a simplistic comparison of processing power. This paper compares the characteristics of generic special-purpose and general-purpose signal processors to emphasize critical differences.

Hampton Room—Session 3C
Seakeeping

Moderator:
Capt. **Perry W. Nelson**, USN (Ret.)
Terrence R. Applebee, assistant

9:30 A.M.

"Human Factors Engineering Principles for Minimizing Adverse Ship Motion Effects: Theory and Practice," by Dr. **Alvah C. Bittner** and Dr. **John C. Guignard**

As part of a wider seakeeping program conducted by the DTNSRDC, two mission-critical workstations were evaluated for the U.S. Coast Guard. These workstations—the communications support center and the communications center—have been specifically identified by the USCG as having exceptional seasickness problems. Five potentially applicable human factors engineering approaches to enhance seakeeping through prevention and mitigation of adverse ship motion effects, especially seasickness, were recognized and are discussed in this report in the light of observations made aboard the ship.

10:15 am

"Methods for Designing Hull Forms with Reduced Motions and Dry Decks," by **David A. Walden** and **Peter Grundmann**

Twenty existing frigate and destroyer hulls have been used in an investigation of the influence of hull form on seakeeping. Investigations have been carried out to determine if the relative performance rank of the ships changes as a function of ship speed or modal wave period. For example, is the ship that is best at high speed also best at low speeds? A similar study has been carried out of the relative rank of the ships as a function of the weighting factors assigned to different motions included in the measure of merit. Also, does the ship with the least slamming also have the least pitch?

11:00 am

"Recent Advances in the Seakeeping Assessment of Ships," by **Kathryn K. McCreight** and **Ralph G. Stahl**

Three factors affect the performance assessment of a ship in a seaway: the mission requirements, the motion characteristics of the ship, and the environment. Utilizing advances in all three areas, a technology has been developed that facilitates evaluation of the percent of time a specified mission can be performed by a specified ship at a specified location. In conjunction with limiting motion criteria that represent the mission requirements, and transfer functions that represent the motion characteristics of a ship, wave data for each of 57 locations in the North Atlantic and 21 locations in the North Pacific are used to develop contours that describe bands of constant percent of operability. Effectively, responses to numerous wave spectra and the probabilities of occurrence of the wave spectra are considered for each location so that the resulting contours have a reasonable degree of validity.

Palladian Room—Session 4A
High-Performance Craft

Moderator:
William M. Ellsworth
Allen G. Ford, assistant
2:30 pm
"A New Generation of High-Performance Planing Craft," by **Otto P. Jons**, **Joseph Koelbel**, and **Raymond Sheldon**

This paper addresses the key aspects of the design development of a capable yet affordable high-performance craft. These aspects include the development of mission requirements, the rationale for major design decisions, performance capabilities, and system and subsystem selection. The superior performance of the design, as demonstrated by an extensive model test program, led to the decision to develop a family of advanced fast patrol boat concepts. Selected family members are also briefly introduced. The paper also demonstrates the successful integration of many major computer-aided design (CAD) programs currently in use for U.S. Navy ship design.

3:15 pm
"Air Cushion Landing Craft Navigation," by **Herbert R. Graham**, Dr. **John C. Kim**, **Edward G.U. Band**, **Alex W. Fowler**

This paper considers the problems involved when navigating a high-speed air cushion vehicle by dead reckoning in conditions of poor visibility, and presents a method to assess the ACV's navigational capabilities under these circumstances. A figure of merit is used to determine the sensitivity of factors that affect navigation, such as the range of visibility, point-to-point distance, speed, turning radius, and accuracy of on-board equipment. The method provides simplistic but adequate answers, and can be used effectively to compare the capability and cost of alternative navigational concepts.

4:00 pm
"A Quick Change—Commerical Surface Effect Ship to Coast Guard Patrol Boat," by Cdr. **Ronald J. Marafioti**, USCG

In 1982, the U.S. Coast Guard procured three off-the-shelf, high-performance craft to satisfy an urgent operational need for additional law-enforcement resources. Although originally designed for offshore crew/supply applications, the three 110-foot aluminum surface effect ships (SES) delivered by Bell Halter were modified to satisfy immediate Coast Guard needs. The first two were placed in service in 1982 and the third in 1983.

This paper reviews the strengths and weaknesses reported during the operations of these uniquely designed patrol boats, describes the first stage and subsequent retrofit modifications required to improve their application to Coast Guard service, and introduces modifications to be considered to extend the overall benefit of the unique features of the SES for marine applications.

Diplomat Room—Session 4B
Combat Systems II

Moderator:
Como. **Lowell J. Holloway**, USN
James F. Horton, assistant
2:30 pm
"A Methodology for Setting Combat System Requirements," by **Dennis Mensh**

This paper describes a methodology for setting combat system requirements for all ship classes. The requirements are determined from a battle group perspective. The methodology uses ship damage as a measure of effectiveness for setting combat system requirements. The ship damage data used in this methodology was derived from the Navy tactical game, NAVTAG.

The methodology that determines ship class combat system requirements consists of a set of logical steps that are iterative by design. The methodology provides insight and valid estimates of numerical measures of defined force requirements at several levels. This process is not trivial; the expected level of effort could be significant.

The methodology consists of five basic stages considered necessary to achieve valid results. These stages are: determination of force level requirements; determination of force level capability; analysis of force level capability; determination of class requirements by battle overviews; and determination of class requirements, overall.

3:15 pm
"Lightweight Broadband HF Communications Antenna (LWCA)" by **Roy J. Biondi**, **Richard W. Pride**, **Harold D. Murray**, and **Paul K. Wheeler**

With the ever-increasing complexity in the integration of the topside environment, the RF aspects of the antenna designs must be augmented by detailed analysis of the operating environment and the mechanical designs if the goals of reliability and quality performance are to be achieved.

The Naval Electronics Systems Command has developed a new Broadband HF Communications Antenna. This paper traces its design evolution and describes the processes in determining current design deficiencies, the design ob-

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jectives to correct these deficiencies, and the results obtained.

4:00 pm

"The Application of Artificial Intelligence to Future Tactical C^2 Design," by **Arthur J. Murray**

This paper develops a top-level design for an artificial intelligence (AI) based system that can provide a command level decision-maker with timely and accurate information to support optimal utilization of assets to be employed in theater tactical combat situations.

The paper is divided into two main portions. The first part discusses AI in the general sense, that is, what it is and what it is not, and why such an approach could have broad-sweeping applications in naval battle command and control. The paper then illustrates a generic AI-based decision support system.

The second part of the paper is directed toward examining a specific application of decision support system technology, using Tomahawk mission planning and force management in a battle group as an example, with support to the battle group commander being the primary focus.

Hampton Room—Session 4C
Energy Conservation

Moderator:
Dr. **Robert C. Allen**

Dana Gentile, assistant

2:30 pm

"Application of Variable-Speed, Constant-Frequency Generators to Propulsion-Derived Ship Service," by **Henry N. Robey**, **Howard O. Stevens**, and **Kenneth T. Page**

The higher specific fuel consumption of present U.S. Navy gas turbine generators, when compared with main propulsion gas turbines, has led to the investigation of propulsion-derived ship service electrical power. Variations in propulsion engine speed require that a generator provide constant frequency with a variable-input shaft speed. A fuel use analysis has been conducted of the application of a variable-speed, constant-frequency generator to a four-gas-turbine, twin-shaft destroyer.

Other considerations are the quality of ship service power with the introduction of power electronics to the generating system, and the impact of the new components on system weight, volume, and survivability. Propulsion-derived ship service utilizing VSCF generators offers to provide substantial benefit to Navy combatant ships through the application of proven technology.

3:15 pm

"Shipboard Cogeneration—A Second Generation Design Approach," by **Thomas P. Mastronarde**

On the CG-47 Class guided missile cruisers, gas turbine electric generators are operating in a shipboard cogeneration system in conjunction with a successful and reliable waste heat recovery system that provides steam for auxiliary services. The current application philosophy for waste heat recovery from gas turbine auxiliary engines aboard Navy ships, however, has reached a technological plateau.

The development and implementation of a second generation waste heat recovery system design could produce substantial benefits for future naval shipboard applications. This paper discusses methods of optimizing the interface between the gas turbine and the waste heat boiler, relocating boiler components, using natural instead of forced circulation to the boiler, and reducing the complexibility of feedwater treatment subsystems.

4:00 pm

"Opportunities for Pacific Fleet FF-1052 Class Ships to Save Energy," by **Hasan Pehlivan** and **Clarence W. Kenyon**

The shipboard energy conservation assist team (SECAT) program was introduced to the U.S. Pacific Surface Fleet (SURFPAC) in 1983 following one year of testing in the Atlantic Surface Fleet (SURFLANT). Experiences aboard SURFLANT ships provided the basis for improvements that could also be made to SURFPAC ships. Chief among these improvements were simplified fuel measurement, fuel curve development methods, an energy survey checklist, and an equipment status board that identifies economic machinery alignments.

This paper discusses recent improvements in the SECAT program. It also examines the differences in

fuel consumption observed between SURFLANT and SURFPAC ships. It also analyzes the economies of potential solutions to the higher fuel consumption problem aboard SURFPAC ships, with special emphasis on alternative burner designs and forced-draft blower changes. Recommendations are made to reduce fuel consumption both by equipment changes and improved procedures.

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Marlin Drilling Company Rig No. 7 Upgraded

The semi-submersible offshore drilling rig, Marlin No. 7 owned by Marlin Drilling Co. of Houston, recently departed Mobile, Ala., after the upgrading and installation of a new 18.75-inch 10,000 psi blowout preventer (B.O.P.) stack. Also installed were new transfer carts for the B.O.P. stack and lower marine riser package along with new B.O.P. hose reels and B.O.P. jumper hoses. A new Halliburton HT-400 cementing unit, a second high pressure cement line, and a new piping system for Mud Pit Dump Valves were also installed along with various rig repairs and maintenance.

The work was completed in a 17-day time frame by Knights's Piping and Marine Inc., a Pascagoula, Miss. company that services marine and industrial needs worldwide both offshore and onshore.

Marinette Marine Offers Brochure On Shipbuilding Facilities And Capabilities

Marinette Marine Corporation, a privately owned shipbuilding company in northeast Wisconsin that builds naval and commercial vessels of steel, aluminum and wood to 400 feet, is offering an informative new free 24-page color brochure on the company's shipbuilding facilities and capabilities. Titled "Performance," the publication serves as a demonstration, using photos and explanatory text, of how Marinette Marine builds ships for its customers.The brochure opens with a preface—"Marinette Marine—More than A Shipyard"—which emphasizes that the company designs to specific requirements, builds within budget and delivers on time because, in addition to being a shipyard, they're a carefully structured, coordinated organization. Undergirding physical facilities and equipment is a finely tuned system for planning, organizing, scheduling and monitoring every phase of construction.

After the preface, the next four pages are devoted to "The Yard," with photos that include a bird's-eye view, various phases of work in progress, launchings, and multiple vessels being constructed in assembly line fashion. Marinette Marine is described as covering 30 acres and stretching along 2,100 feet of the Menominee River. Over 300,000 square feet under roof permit year-round construction, and large fabrication shops, a wide erection area, and three launchways provide the space needed to construct the multiple vessels in assembly line fashion. Separate cutting, fabrication, assembly and trade shops enable the constuction of ships in stages using prefabricated structural components and preassembled modules. To maximize efficiency and accuracy, a computer is used for both lofting and cutting, and two numerically controlled plasma burning machines cut precisely dimensioned

parts from plates up to 24 feet wide. There is also an optical torch-cutting machine for smaller jobs. The text mentions that a rail spur gives the yard direct rail service, and to guard against shortages adequate supplies of steel are stored and standard inventories of other essential parts and materials are carried.

A section devoted to "The People" emphasizes that the yard has recruited experienced professionals with skills and talents covering all aspects of shipbuilding. A large, highly skilled work force is employed and new employees go through extensive training programs to receive certification in their trades. Various photos of company personnel in action are used to illustrate this portion.

The next six pages of the brochure are most illuminating in that they are given over to a discussion of how Marinette Marine goes about building ships for its customers. Titled "The System," it traces the building process from the initial idea through to the completed vessel. This section is profusely illustrated with photos of discussion groups and of work in progress at various stages of the building process.

A final section, titled "The Record," contains photos of some of the 1,200 vessels Marinette Marine has built so far. In addition to these photos, the cover features a striking photo of the U.S. Naval Ship Mohawk.

For a free copy of the impressive new color brochure from Marinette Marine,

Circle 19 on Reader Service Card

MarAd Awards Contracts Totaling $2.7 Million For Repairs To RRF Ships

The Maritime Administration has awarded three contracts totaling some $2.7 million for repairs to three ships in the Ready Reserve Force (RRF).

The RRF is a special component of the National Defense Reserve Fleet. Merchant vessels in this category are funded by the U.S. Navy and maintained by MarAd in a high level of readiness, insuring that they can be activated and on berth prepared to take on cargo within five to 10 days.

The awards include a $1,889,177 contract to Norfolk Shipbuilding & Drydock Corporation for drydocking, repairs, and other work on the Santa Lucia. The 12,700-dwt breakbulk cargo vessel, built by Sun Shipbuilding in 1966, was among six ships acquired by the Navy for the RRF from Delta Steamship Lines last year. The work is scheduled to be completed in 67 days

Weldtest, Inc. of Port Arthur, Texas, received a $527,840 contract for topside repairs and other work to bring the Gulf Merchant up to RRF standards. To be performed at Orange, Texas, the work will include special survey items required by the American Bureau of Shipping, a biennial inspection by the U.S. Coast Guard, topside blasting and coating, and repairs to oil/water separator equipment.

Levingston Shipbuilding Company of Orange was awarded a $298,235 contract for topside repairs and other work on the Gulf Trader. This work is also designed to bring the vessel up to RRF standards, and involves a special annual ABS survey, topside blasting and painting, and the installation of an oil/water separator.

Osmose Offers Brochure On Marine Wood Products

Osmose Wood Preserving Company, Griffin, Ga., is offering a free brochure on the use of Osmose Brand Wood Products in marine applications.

Osmose Wood Products are pressure treated with a 100 percent oxide-pure waterborne preservative, and are both environmentally safe and resistant to decay and the corrosive effects of saltwater and wood destroying marine organisms. They are available for a variety of marine applications, including bulkheads, seawalls, breakwaters, groins, decks and piers.

For a free copy of the Osmose Marine Products brochure,

Circle 98 on Reader Service Card

Stanford Study Shows That Oceanrouting Reduces Casualties

A recently released statistical study of weather-related ship casualties shows that the use of oceanrouting services substantially reduces casualty rates. Performed by a statistician from Stanford University, the study examined more than 150,000 crossings of the North Atlantic and North Pacific during a four-year period between 1978 and 1982. Through several statistical methods it was determined that ship operators using an oceanrouting service can expect at least 15 percent fewer weather-related casualties than operators who do not utilize such a service.

Until now the hypothesis that ship routing reduces casualty rates had not been proven, although organizations such as the International Maritime Organization (IMO) had in fact acknowledged the value of routing ships at sea. In 1983 IMO passed a resolution that said in part: the IMO, "Being of the opinion that the practice of weather routing has proved a benefit to ship operations and safety of ships as well as their crews and cargoes . . . recommends governments to consider encouraging ships under their flags to make use of weather routing services provided by marine meteorological services on voyages either across the North Atlantic or the North Pacific." At the same time, this was seen by many as a major endorsement of weather routing services, but further data that could remove doubt about the issue was requested by various interested parties.

The study's author, **James N. Miller**, used data supplied by Lloyd's of London Press for the total number of Atlantic and Pacific crossings. The casualty data was provided by Lloyd's Register of Shipping. Oceanroutes, Inc. of Palo Alto, Calif., one of the world's largest private firms in the field of marine meteorology and ship routing, supplied data covering more than 26,000 vessels the company routed during the four-year study period.

Along with the oceanrouting variable, the study also considered other factors assumed to affect the casualty rate of ships such as age, type, tonnage, flag of registry, ocean crossed, and season of crossing. The study pointed out that, of the variables considered, a vessel's age has the greatest effect on casualty rates. The variables were significant in the following order: vessel weight, season of crossing, type, flag, ocean of crossing, and whether oceanrouting services were employed.

Oceanroutes' vice president of operations, **Gary Kanemoto**, pointed out that although the decision to use routing services has a smaller effect on the casualty rate than the other six variables, "it is most often the only variable over which an operator has control." Furthermore, the study determined that when the effects of the other variables were statistically removed, the routing decision continued to have a positive effect on casualty rate.

The Salvage Association concurs with the results of the study, and has sent summaries to each of its worldwide offices. The study is available for review in the Association's headquarters in London, or in any of Oceanroutes' branch offices located in Aberdeen, Hong Kong, Houston, London, New York, Perth, Singapore, and Tokyo.

For a copy of the study and additional information on Oceanroutes' services,

Circle 42 on Reader Service Card

CDI Marine Awarded $3.9-Million Navy Contract For Design Services

CDI Marine Company, headquartered in Jacksonville, Fla., has been awarded a $3.9-million U.S. Navy contract to provide engineering and design services to the Naval Ship Repair Facility in Yokosuka, Japan. Services will be provided through a liaison office in Yokosuka and an expansion of the existing company office in Seattle.

Circle 170 on Reader Service Card

Marathon Introduces Semisubmersible For Gulf Of Mexico Environment

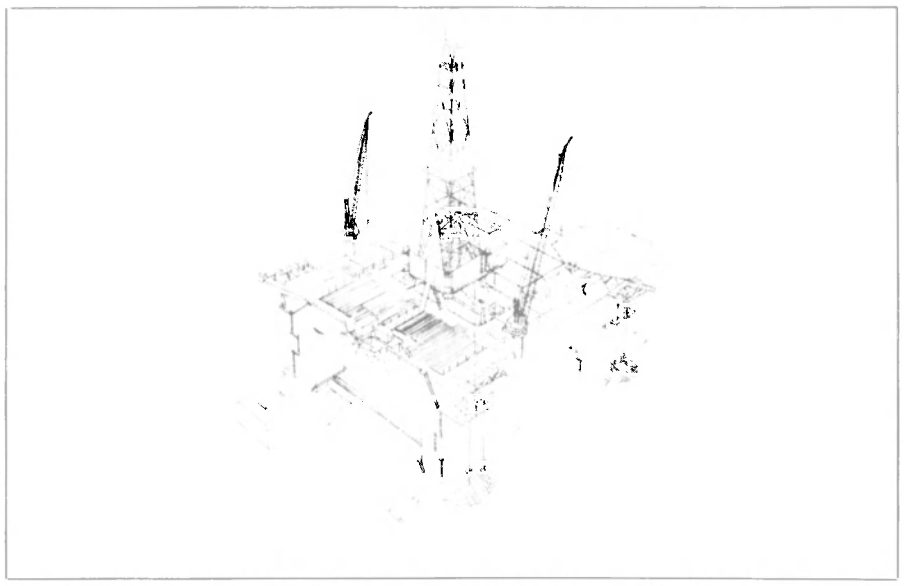
Marathon LeTourneau Offshore Company of Houston recently announced its new GranGulf® Class semisubmersible drilling unit that is rated to drill in water depths up to 3,000 feet and can carry a deck load of 4,000 tons. As the leading U.S. producer of offshore drilling units, Marathon developed this new design to fill the offshore industry's need for a semisubmersible drilling rig that is specifically suited to the deepwater Gulf of Mexico operating environment and other areas with similar conditions.

Recent Department of the Interior deepwater lease sales in the Gulf of Mexico have added promising new acreage in water depths ranging from 500 to 2,500 feet. Newly built, large North Sea class semisubmersibles, some of which have been relocated to the Gulf, are constructed for much harsher operating environments, and represent a less than cost-effective option for oil and gas exploration in these new deepwater tracts.

The GranGulf offers optimum payload for a semi of this size and weight. In addition, its design incorporates a unique lower hull configuration, for which a patent is pending, that gives the unit superior storm response characteristics, less transit resistance, and better wave clearance, all without loss of normal station-keeping performance while drilling.

The new design semi is a four-column stabilized unit. There is the option for propulsion assist or dynamic positioning capabilities. As a statically anchored unit, its maximum water depth is 2,000 feet; equipped with optional dynamic positioning, it can drill in water depth up to 3,000 feet.

Overall length is 280 feet and overall beam is 195 feet; height to main deck is 96 feet. Maximum storm conditions are: wave height, 100 feet; wind velocity, 100 knots; current, 3 knots.



Artist's illustration of the GranGulf, the new semisubmersible drilling platform designed by Marathon LeTourneau Offshore company.

As the leading builder of jackup drilling rigs for 30 years, Marathon LeTourneau has historically provided new designs for increasing water depths and for the harsh and hostile environments of newly opened frontier drilling areas. The company's most recent new jackup designs, the Gorilla and Super 300 bottom-supported rigs with Slot-lever® capabilities, are currently extending the range of self-elevating

(continued on page 44)

Marathon's New Rig Design

(continued)

units into remote areas with water depths of 450 feet. The introduction of the GranGulf Class semi continues this trend of providing new mobile offshore drilling units intended for new operating environments.

Marathon's line of jackups ranges from large, deepwater, hostile environments to compact, shallow-water units for mild environments. The company also builds other types of offshore drilling vessels, including semisubmersibles, drillships, and tenders, and performs repair and modification work on all classes of offshore drilling units. Marathon has rig construction facilities in Vicksburg, Miss.; Brownsville, Texas; and the Republic of Singapore. Marathon is a Penn Central company.

Circle 86 on Reader Service Card

Mary Frances Anderson (center) was guest of honor and sponsor at christening of ship named for her brother. Shown with her (L to R) are: **Birger Jurgensen**, executive vice president of Maersk Line, Limited of New York; his daughter who served as maid of honor; Lt. Gen. **William R. Maloney**, USMC, guest speaker; and **David Watson**, general manager of the yard.

T-AKX Prepositioning Ship Delivered By Bethlehem's Sparrows Point Yard

Bethlehem Steel Corporation's Sparrows Point shipyard near Baltimore recently christened and delivered its second reconstructed maritime prepositioning ship. The RO/RO vessel was named the Pfc. James Anderson Jr. in honor of the Vietnam war hero who was a posthumous recipient of the Congressional Medal of Honor.

Sponsor of the vessel was **Mary Frances Anderson** of Carson, Calif., the sister of Pfc. **Anderson.** Shipyard general manager **David Watson** officiated at the christening ceremony, and was joined in recognizing Pfc. **Anderson,** the first black U.S. marine to receive the nation's highest medal, by Lt. Gen. **William R. Maloney**, who was representing the Marine Corps and its commandant, Gen. **Paul X. Kelley**. Gen. **Maloney** was introduced by Commo. **Richard F. Donnelly**, vice commander of the U.S. Navy's Military Sealift Command.

The ship now carrying this marine hero's name, along with four other Maersk RO/RO vessels, was selected in 1982 to be reconstructed by Bethlehem Steel because, with the redesign, she would be well-suited to the prepositioning ship mission.

The Pfc. Anderson will provide the capability for quick reaction by Marine Corps troops at trouble spots anywhere in the world. The ship will be used for the mobile, long-term storage of vehicles, weapons, ammunition, fuel, and other material to resupply a Marine Amphibious Brigade.

To meet these mission requirements, Bethlehem separated the vessel amidship and added a 157-foot midsection, extending her length to 755 feet. Her depth was changed with the addition of two deck levels, increasing the deck-to-keel depth from 54 to almost 70 feet. This required the alteration of three decks— first, main, and upper.

These expansions provided more cargo hold, space for a third set of twin 36-ton cranes, and an additional 80-person deckhouse for "surge" crews during periodic loading and unloading. The normal crew complement will be about 65, composed of civilian and Military Sealift Command personnel.

Other major additions included new ramps, fuel tanks, repair shops, and a helicopter landing platform aft. Bethlehem was able to gain production speed by pre-outfitting many of the new modular units with piping, cable ways, and machinery before lifting them into place aboard the ship.

Reconstruction statistics, with the new 755-foot length and 69-foot 10½-inch depth, include a displacement of 28,249 long tons and a 32-foot 10½-inch full-load draft. Diesel

Prepositioning ship Pfc. James Anderson shown on sea trials prior to delivery.

engine power will provide a speed of 17.2 knots at 80 percent of rated horsepower output. The ship's range is 10,800 nautical miles.

Onboard capacities are 120,000 square feet for vehicles, provisions for 313 ammunition and refrigerated cargo containers, 1.3 gallons of drummed and bulk petroleum products, 84,933 gallons of potable water, and 615,083 gallons of fuel.

The first prepositioning ship, Cpl. Louis J. Hauge Jr., was delivered by the Sparrows Point yard in the summer of 1984. In addition to the Anderson, one more ship will be delivered by the Baltimore yard in the fall of this year.

Another Maersk sister ship was delivered, and one more is scheduled to be delivered, from Bethlehem's Beaumont, Texas, shipyard. In total, the five-ship military reconstruction effort represents a contract of more than $600 million to Bethlehem.

The reconstruction of the three ships at Sparrows Point created a demand for more than 19,200 tons of steel plate from Bethlehem's adjacent rolling mills.

Maersk Line, Limited of New York will operate the ships for the Military Sealift Command.

"No-Leak" Seal From Falk Keeps Oil In And Dirt Out

The Falk Corporation, Milwaukee, Wisc., has developed the Magnum™ Seal. An innovative seal with no wearing parts, it is said to offer long life protection for parallel shaft and horizontal right angle speed reducers. When properly installed and maintained the seal will not leak.

The Magnum Seal solves the leakage problems encountered with conventional single-lipped and double-lipped contact seals and helps protect against damage to shafts. Because it has no wearing parts it is said to last as long as the drive.

The inner cage of the seal, designed to radial and axial design clearances of approximately .005-inches, fits precisely over the drive shaft and against the bearing. Although the shaft rotates without touching the seal, there is virtually no passage of oil under normal operating conditions.

It also features the oil drainback which assures oil tightness of the seal. The little oil which might get through is immediately routed back to the gear box via this drainback passage in the inner seal cage and housing wall.

The Magnum design traps dirt, grit and abrasive particles in the grease in the outer cover before they reach the oil sealing surface. As further protection against contaminants, a fitting on the cover and a grease-exclusion seal permits purging the chamber with fresh grease.

The Falk Corporation is a subsidiary of Sundstrand Corporation.

For further information on the Magnum Seal from Falk,

Circle 32 on Reader Service Card

National Marine Study On PowerLube 750® Now Available

A study recently conducted by National Marine Service on a newly-developed upper cylinder lubricant, demonstrated a 10.8 percent reduction of fuel consumption at 850 rpm and a 13.7 percent fuel consumption reduction at 750 rpm. The test was on PowerLube 750, an upper cylinder lubricant product developed by Lubritech International Corporation of Bethesda, Md.

When measured in terms of brake specific fuel consumption the test engine showed a 9.5 percent increase in fuel economy at the 850-rpm maximum running rate. At 750 rpm, the test showed an 11.3 percent fuel economy. The test engine was an EMD 16-645CE6 which used a single source of fuel supply throughout the tests.

The lubricant is delivered to the upper cylinder area by adding the Lubritech product to an engine's fuel supply. After five years of evaluating the formula as a two-phase system of cleaner and separate lubricant, the firm recently introduced PowerLube 750 as a one-step product.

For a copy of the National Marine study of PowerLube 750,

Circle 46 on Reader Service Card

Constant-Tension Winch Now Available From W.W. Patterson Company

W.W. Patterson Company, Pittsburgh, Pa., now has available their new Model M65-H-70I-1.5 constant-tension hydraulic winch. It provides controlled tension for tugs when pushing in the notch of an oceangoing barge. It features a low, 30-inch profile; gearing and roller-chain are splash-lubricated and completely enclosed. Structural components are galvanized and working components are made of stainless steel.

The rated line pull is 22,000 pounds at 2,000 psi and rated speed is 26 fpm at 30 gpm. The shock load capacity is 130,000 pounds, drum capacity is 70 feet of 1½-inch-diameter wire rope.

For more information on the new hydraulic winch from W.W. Patterson,

Circle 94 on Reader Service Card

Literature Available On Warren Pyroite® Pumps

Warren Pumps, Warren, Mass. has literature available on its new line of Pyroite® advanced reinforced composite pumps. The lines consist of horizontal and vertical centrifugal pumps and horizontal and vertical vortex pumps for capacities to 3,000 gpm and heads to 365 feet. Also now available are Warren Pyroite vertical turbine pumps for capacities to 3,000 gpm and heads to 900 feet.

Pyroite will handle acids, alkalines, hydrocarbons, salt water, deionized water and nearly all corrosive or erosive liquids at temperatures to 500 degrees F.

For literature containing further information on Warren's Pyroite pumps,

Circle 49 on Reader Service Card

Arnessen Moves Offices To New Jersey

The Arnessen Corporation, in order to consolidate its sales, service and manufacturing operations, has moved its corporate offices as well as its supply, service and marine systems divisions from Brooklyn, N.Y. to its manufacturing headquarters at 1100 Walnut Street, Roselle, N.J. 07203. This one address now serves all Arnessen operations, including the continuing operations at this address of the corporation's corrosion dynamics division. The telephone number is (201) 241-3535, telex: 23 2028 (ARNE).

For further information on Arnessen,

Circle 35 on Reader Service Card

Capacity of Cockatoo Dockyard's Vickdock® Expanded To 1,000 Tons

The Vickdock system of submersible drydock for small craft originally catered to vessels of up to 300 tons displacement. Due to worldwide inquiries, the range of models with lifting capacities of 20, 30, 50, 100, and 300 tons has now been increased to include units of 500 and 1,000 tons lifting capacity.

Variations to standard dock designs have also been developed to suit hydrofoils, Jetfoils, and catamaran craft, including the revolutionary wave-piercing catamaran. Blocking and support on the Vickdock floor allows these sophisticated craft to be drydocked with safety, and provides a clear working space around the hull.

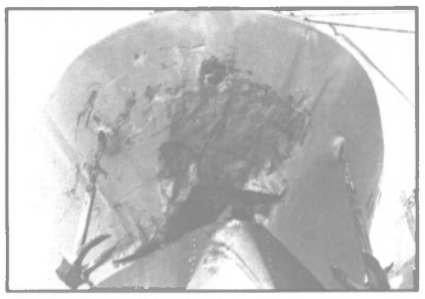
These special blocking and support arrangements for non-conventional craft can be withdrawn hydraulically to the dock wings to permit the docking of standard monohull vessels up to the design lifting capacity.

The Vickdock range has been designed and developed by the Australian-based shipbuilding and engineering company Cockatoo Dockyard Pty. Ltd. at its Sydney shipyard. Austral Lift Inc. of San Pedro, Calif., is licensed to sell the Vickdock in the U.S. and arrange for construction by American contractors at or as close as possible to the client's site.

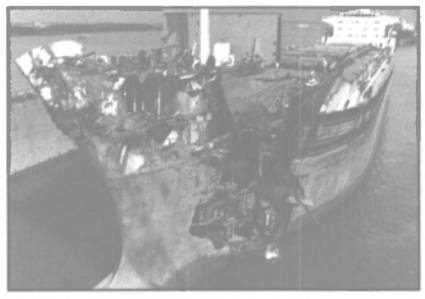
For further information on the Vickdock,

Circle 29 on Reader Service Card

Rig to be rebuilt
moving ashore.



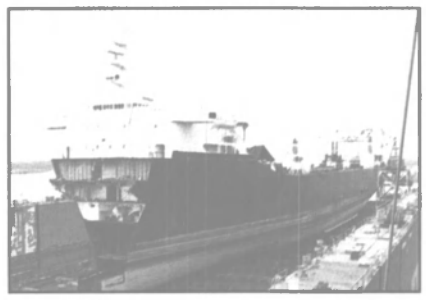
ASTROS before.



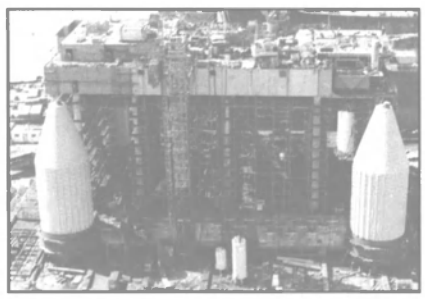
OOPS

Column removal,
deckhouse rebuilding.

ASTROS after.



What you lose on a rock
we replace in our dock.



Structure erected,
return to dock.

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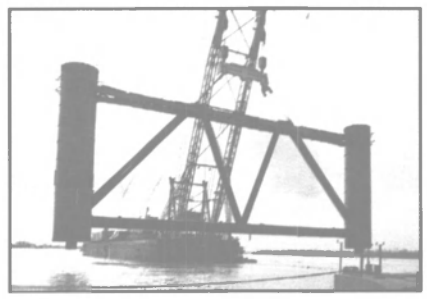

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heavy lift services.

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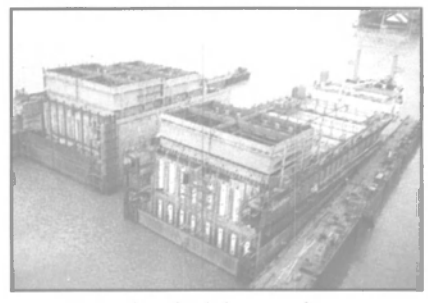
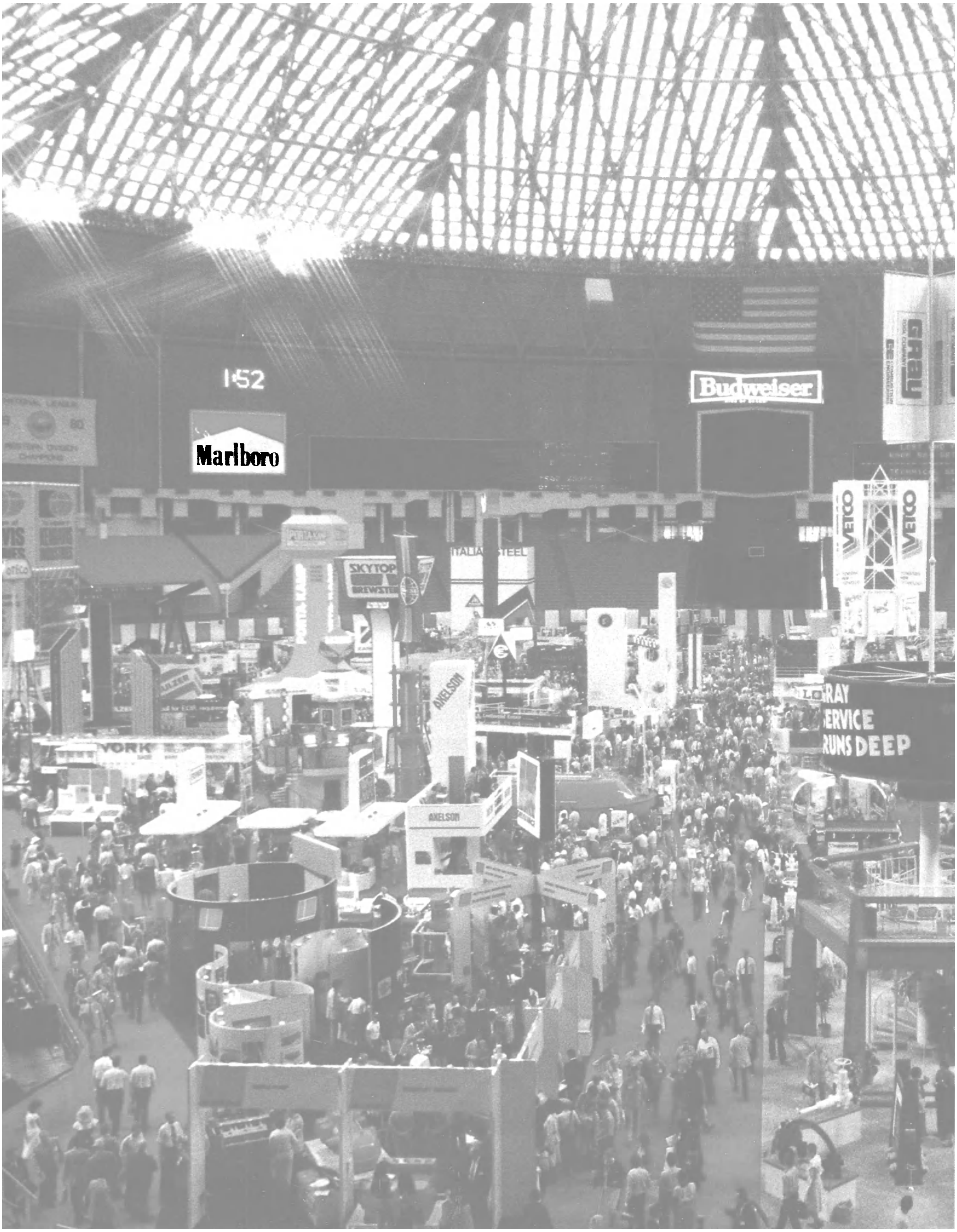
2 rigs in 900-foot length,
220-foot width inside wing
walls of dock.

20,000-ton Panamax dock.
150-ton crane ashore.



Jumboizing and
major conversions.


152
Marlboro
Budweiser
GRAY
VETCO
VETCO
SKYTOP
BREWSTER
AXELSON
AXELSON
YORK
RAY
ERVICE
RUNS DEEP

OTC '85

SPECIAL PREVIEW

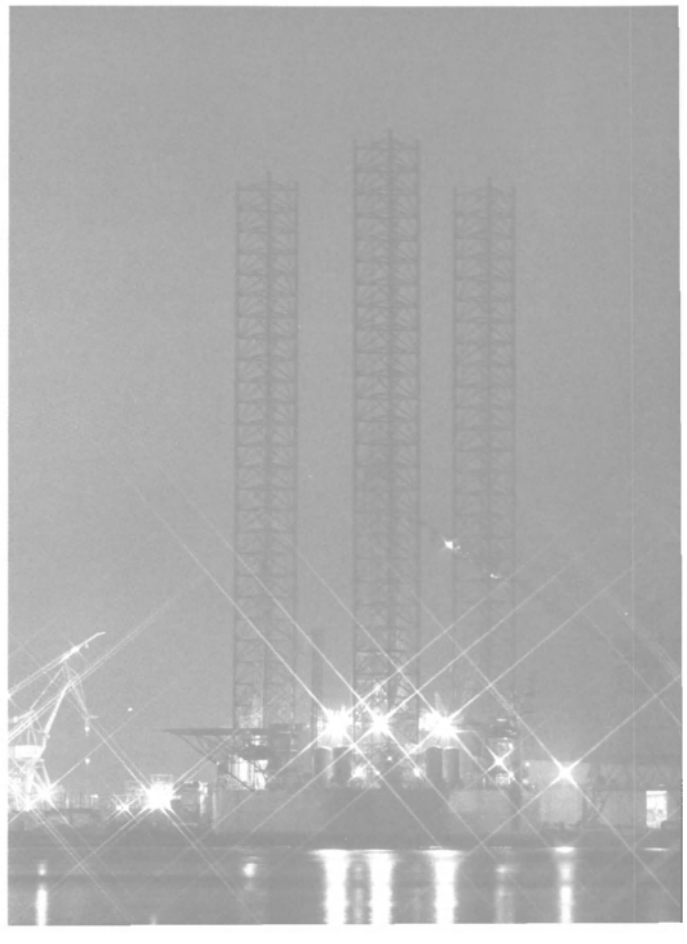
May 6-9, 1985, Houston

This year's 17th Annual Offshore Technology Conference (OTC) will take place at Houston's Astrodomain from Monday, May 6 through Thursday, May 9. OTC is an international technical meeting devoted to information exchange on offshore resources development. It is sponsored each year by 11 of the world's leading engineering and scientific associations, including The Society of Naval Architects and Marine Engineers and the Marine Technology Society.

While focusing on frontier technology, this year's program of 252 papers in 41 sessions also addresses topics as diverse as safety, foundation behavior, seismic surveys, oceanography, and marine mining, among others.

Complementing the technical program this year will be an unmatched exhibition of products and services covering more than 25 acres of the Astrodomain complex. More than 2,000 companies—the world's major manufacturers of offshore-

(continued on page 50)



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related equipment and services—will use OTC as a forum to unveil major improvements and innovations for handling present-day challenges as the industry moves to deeper waters and increasingly hostile conditions.

OTC '85 takes place during the "Year of the Ocean," declared by the United States to increase awareness of the complex issues involved in reaching the full potential of all types of marine development. This is the same premise on which OTC was founded and continues on a worldwide basis—improved offshore technology and development of resources in an environmentally sound manner through cooperation of all major engineering and scientific disciplines.

For four days some 65,000 engineers, scientists, and managers from 90 nations will hear outstanding technical presentations and view an array of technical equipment and services available for today's offshore challenge.

Top petroleum industry executives will address the important issues facing deepwater operators in the opening general session, "The Challenge of Deep Water." Leading off the 2½-hour session on Monday morning, May 6, will be **John F. Bookout**, president of Shell Oil Company, who will present an overview of the deepwater challenge. Next, the managing director for British Petroleum Exploration, **Basil R. Butler**, will discuss worldwide deepwater exploration prospects.

Patrick J. Early, senior vice president of production with Amoco Production Company, will comment on deepwater drilling systems. **Harry J. Longwell**, vice president of production with Exxon Company U.S.A., will discuss deepwater production systems; and **F.E. "Tut" Ellis**, executive vice president with Conoco Inc., will address the economics of deepwater exploration and production.

OTC Awards

Lymon C. Reese, professor of civil engineering at the University of Texas, and **Hudson Matlock**, vice president for research and development with The Earth Technology Corporation of Long Beach, Calif., will share honors as joint recipients of the 1985 OTC Distinguished Achievement Award for Individuals.

Through their research and engineering practice, the pair has made significant contributions to the development of soils and foundation technology and its application to offshore platform design. Computer programs and soil/pile interaction criteria they developed years ago still form the basis for most pile foundation design practices. Prof. **Reese** and Mr. **Matlock** will accept their honor during the OTC Awards Luncheon on Monday, May 6, in the Astrohall Ballroom.

Topical Luncheons

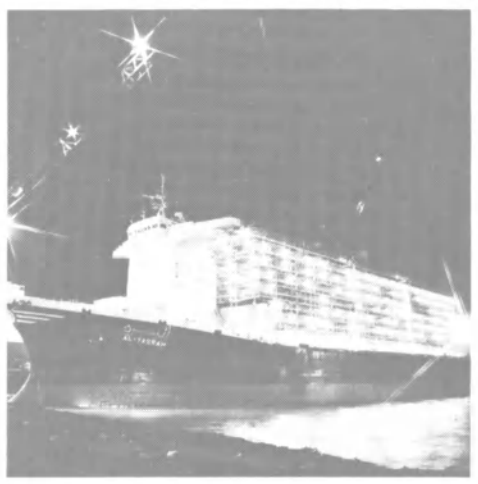
Registrants at OTC '85 will have an opportunity for informal discussions with offshore experts during a series of five Topical Luncheons on Tuesday and Wednesday, May 7 and 8. These popular luncheons feature speakers' comments followed by open question-and-answer periods.

Tuesday's luncheon topics are "The Hutton TLP—First of a Kind" at the Shamrock Hilton Hotel, and "Meeting the Technology Challenge in the Canadian Arctic" at the Marriott Astrodome Hotel. In the first, **L.B. "Buck" Curtis**, vice president of production engineering services for Conoco Inc., will emphasize two aspects of the Hutton platform's development: the "people" factor, including ways to coordinate work between partners, government approvals, project personnel, and contractors in such a novel undertaking; and the operations factor, including future types and applications of tension leg platforms.

In the day's second luncheon,

(continued on page 52)

For expert maritime capability and a host of services...



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Houston Texas 77057, USA • Tel: (713) 9721180/1187/1204 • Telex: KEPMAR HOU 9108815482

OTC '85

continued

John Loh, manager of frontier development for Gulf Canada, will explain production and drilling programs uniquely developed for use in the Canadian Arctic.

One of three Wednesday luncheon topics is "The Move of Exploration North of the 62nd Parallel and the Accompanying Development of Deepwater Technology" at the Shamrock Hilton. **Christopher Fay**, director of exploration and production for A/S Norske Shell, will review the technology needed to develop deepwater and hostile areas off Norway, including technology used during the Troll field development and in the Tromsoeflaket and Haltenbanken regions.

Fred Shumaker, vice president of Alan C. McClure Associates Inc., will moderate a second luncheon on "Deepwater Production" at the Marriott Astrodome. Panelists will include: **Bruce Collipp**, engineering advisor for Shell Offshore Inc.; **Travis Hutchinson**, president of Offshore Production Systems Inc.; and **Robert Walker**, general manager of Brown & Root's Marine Engineering Division. Each of the speakers will discuss his perspective on deepwater production predictions for the next few years.

At the Shamrock Hilton, a third Wednesday luncheon will feature **J.D. d'Ancona**, director general for Offshore Supply Office, U.K. Department of Energy. His talk on "United Kingdom Continental Shelf—The Second Decade" will include plans for developing the U.K.'s offshore industry to its potential as an international supplier.

OTC '85
Technical Program

Monday—9 a.m. to 12:00 noon

SEDIMENTARY BASINS I — ORIGIN AND EVOLUTION, ROOM 118

OTC
4842 **Integrated Sedimentary Basin Analysis for Petroleum Exploration and Production**
A.R. Green, Exxon Production Research Co.
4843 **Origin and Classification of Sedimentary Basins**
J.A. Helwig, ARCO Oil & Gas Co.
4844 **Rift Basins: Origin, History, Distribution**
K. Burke, Lunar & Planetary Inst.
4845 **A Model for the Evolution of Small Pull-Apart Basins**
W.C. Pitman III and J.A. Andrews, Lamont-Doherty Geological Observatory
4846 **Sedimentary Patterns and Petroleum Exploration in a Foreland Basin: Cretaceous Western Interior**
D.J.P. Swift, ARCO Oil & Gas Co.

GENERAL SESSION, ROOM 114

OTC
5084 **Overview**
J.S. Bookout, Shell Oil Co.
5085 **Deepwater Exploration Prospects**
B. Butler, British Petroleum Co.
5086 **Deepwater Drilling Systems**
P.J. Early, Amoco Production Co.
5087 **Deepwater Production Systems**
H.J. Longwell, Exxon Co. U.S.A.
5088 **Deepwater Economics**
F.E. Ellis, Conoco Inc.

PILE FOUNDATIONS, ROOM 111

OTC
4847 **Pile Load Tests in Dense Sand: Planning, Instrumentation, and Results**
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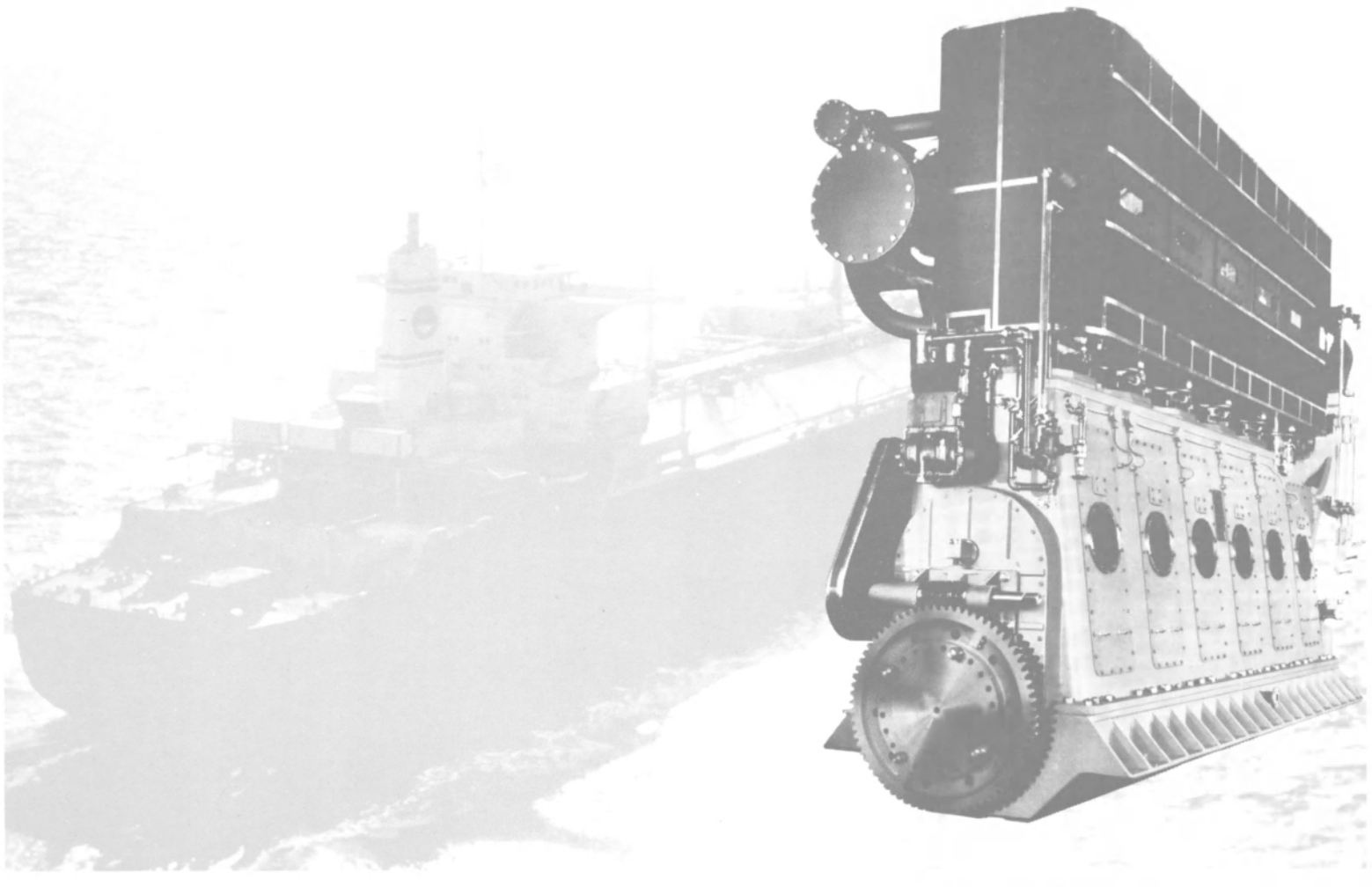

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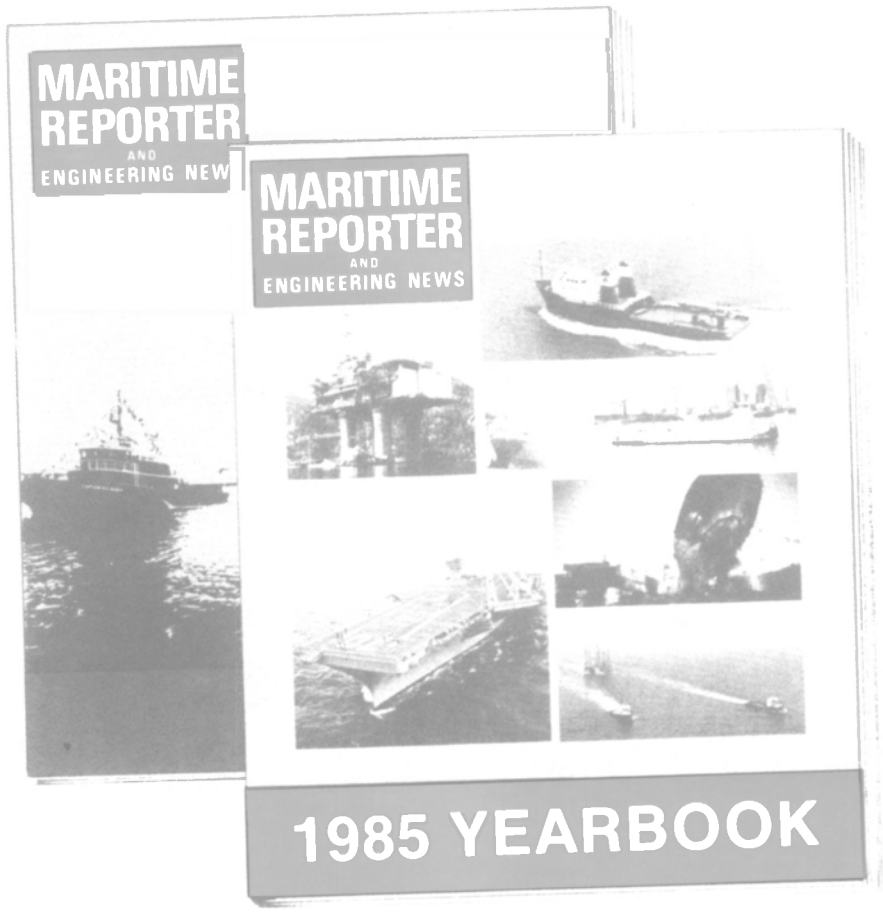

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4885 **Seismic Response of Gravity Structures in a Centrifuge**
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5082 **Jackup Rig Performance in Predominantly Silty Soils, Offshore California**
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A. Murray, K. Evensen, A. Ghoneim, and J. Grinstead, Det norske Veritas (Canada) Ltd.

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I.E. Tebbett and C.J. Billington, Wimpey Offshore Engineers & Constructors Ltd.

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J. Hnatiuk, Gulf Canada Resources Inc., and E.E. Felzien, BeauDril Ltd.

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T. Gijzel, Volker Stevin Dredging & Services Canada; R.A.A. Thomson, BeauDril Ltd.; and J.B.E. Athmer, AVECO Infrastructure Consultants b.v.

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4949 The Hutton TLP Foundation Installation
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4950 The Role of Acoustics for Monitoring and Controlling Subsea Operations During the Development of the Hutton Field
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L.M. Hollingsworth, CanOcean Resources U.S.A., and G. Cassity, Placid Oil Co.

4962 Deep Water Diverless Technology Applied to Shallow Water Operations in Hostile Environments
J.P. Harrington and L.M. Williams, Brian Watt Assocs. Inc.

SEAFLOOR SURVEYING AND MAPPING, ROOM 100

OTC

4964 Evaluating Soils and Hazards in the Mississippi Canyon
J.S. Templeton, J.D. Murff, R.H. Goodwin, and L.W. Klejbuk, Exxon Production Research Co.

4965 Geohazards in the East China Sea and Yellow Sea
J.D. Milliman, Woods Hole Oceanographic Inst.; Q. Yun-shan, Inst. of Oceanology; and J. Butenko, Det norske Veritas

4966 An Appraisal of the Seabed Conditions on the Northwestern Continental Shelf of India
H.N. Siddiquie, D.G. Rao, and K.H. Vora, Natl. Inst. of Oceanography

4967 Geohazard Surveying in the Yellow Sea
K.M. Dao, and B-J. Tang, Inst. of Oceanology; and R. Penton, Ferranti O.R.E. Inc.

4968 The Case History of a High Resolution Seismic Survey in the Central North Sea
F. Kunst, Shell U.K. E&P, and J.F. Deze, Shell U.K.

4969 Beaufort Sea Ice Scour Analysis Using A Computerized Data Base
G. Gilbert, Geoterrex Ltd., A.F. Stirbys, Gulf Canada Resources Inc.; and S. Blasco and K. Moran, Atlantic Geoscience Centre

CORROSION CONTROL, ROOM 124

OTC

4972 Hutton Tension Leg Platform—Innovative Corrosion Control Systems for a New Generation Platform
M.T. Cooper, Conoco (U.K.) Ltd., and J.D.C. Vardon, Brown & Root (U.K.) Ltd.

4971 Offshore Corrosion Protection With Thermal Sprayed Aluminum
W.H. Thomason, Conoco Inc.

4974 Velocity Limits for Erosion—Corrosion
R.H. Heidersbach, Oklahoma State U.

4970 Batch Treatment of Offshore Gas Wells in the East Cameron and Vermilion Areas
S. Evans, Conoco Inc.; and J.M. Phelan and M.E. Williams, Conoco Production Co.

4973 Alloy 625 Weld Cladding of Wellheads and Valves—Review of Dilution Control Techniques and Weld Process Development
P. Koshy, Joy Mfg.

Wednesday—9:00 a.m. to 12:00 noon

FIBER OPTICS AND CABLES, ROOM 118

OTC

4975 Performance Prediction Model for Subsea Fiber Optic Cables
J. Collins, Mobil R&D Corp.; J. Henkener, Southwest Research Inst.; and J. Keating, U. of Texas at San Antonio

4976 The Use of Optical Fiber in Safety System Design
B.A. Kugler, Tenneco Oil Co.

4977 A Fiber Optic Logging Cable System
C. Soodak, G. Gould, and L. McBee, Optelecom Inc.

4978 Offshore Monitoring and Control Using Optical Fibres
G.D. Pitt, Standard Telecommunication Laboratories Ltd.; and J.A. Barnett and D.J. Hill, Standard Telecommunications Ltd.

4979 Design and Operation of a Fiber Optic Link for a Deepwater ROV
E.W. Hughes, Oceaneering Intl. Inc., and G.A. Edgerton, Western Instrument Corp.

4980 Design Features of Improved Electric Submersible Pump (ESP) Cable to Withstand Installation and Service Conditions
D.H. Neuroth, The Kerite Co.

TLP TECHNOLOGY, ROOM 114

OTC

4981 Tension Leg Platform Well System Development Overview
J.R. Labbe, Chevron U.S.A., and M.J. Zimmer, Chevron Corp.

4982 The Prototype Development of a TLP Production Riser Tieback Connector
G.W. Crotwell, E.R. Knerr, and W.A. Valka, Natl. Supply Co.; and C.A. Miller, Stress Engineering Services Inc.

4983 The Design and Analysis of a TLP Subsea Wellhead
W.A. Valka, Natl. Supply Co., and J.R. Fowler, Stress Engineering Services Inc.

4984 The Design and Analysis of a TLP 9 5/8-in. Threaded Connection
W.A. Valka, Natl. Supply Co., and S.A. Fox, Stress Engineering Services Inc.

4985 Riser Tensioners for a TLP Application
F.H. MacPhaiden and J.P. Abbott, Western Gear Machinery Co.

MOBILE OFFSHORE DRILLING UNITS, ROOM 111

OTC

4986 **Industry Action on Stability of Mobile Offshore Drilling Units: A Status Report**
M.W. Praught, Earl & Wright/Consulting Engineers; D.S. Hammett, Sedco Inc.; J.E. Hampton, Southeastern Drilling Services Ltd.; and C.N. Springett, Santa Fe Drilling Co.

4987 **Hydrodynamic Stability of Semisubmersibles Under Extreme Weather Conditions**
E. Huse and T. Nedrelid, Martintek A/S

4988 **Mobile Platform Stability—Project Synthesis With Recommendations for New Philosophies for Stability Regulations**
L.A. Dahle, MartinTek A/S

4991 **Inclined Column Semisubmersible Design**
P.C. Dahan and S.G. Withee, Mobil Shipping & Transportation Co.; T. Akaboshi, and T. Sanomura, Mitsubishi Heavy Industries Ltd.; and A. Joensuu, Wartsila Arctic Research Centre

4989 **Scientific Ocean Drilling: An Overview of the Ocean Drilling Program**
P.D. Rabinowitz, L. Garrison, S. Herrig, R.B. Kidd, A. McClerran, W.J. Merrell, R. Merrill, A.W. Meyer, and R. Olivas, Texas A&M U.

4990 **Ocean Drilling Program: Vessel/Equipment Capabilities**
D. Hammett, Sedco Inc., and A. McLerran, Texas A&M U.

NAVIGATION SYSTEMS, ROOM 107

OTC

4993 **A Multi-Mode Acoustic Position Indicator for Greater Accuracy and Reliability**
J.L. Roberts, Honeywell Marine Systems

4994 **Codeless GPS Systems for Marine Positioning and Navigation**
P.F. MacDoran, J.H. Whitcomb, R.B. Miller, and L.A. Buennagel, ISTAC Inc.

4995 **Acoustic Positioning and Reentry of BOP'S in Deep Water**
K.A. Johansen, J. Olsen, K. Vestgaard, and K. Hansen, Simrad Subsea A/S

4996 **A Test of the Accuracy of A Magnetic Compass-Based Streamer Location System**
P. Jubinski, Western Geophysical Co. of America

4997 **A High-Accuracy Long-Distance-Range Measurement System**
D.M. Coffey and D.L. Paquette, U.S. Naval Underwater Systems Center

FATIGUE, ROOM 100

OTC

4998 **Evaluation of the Stress Intensity Factors for Offshore Structural Tubular Joints**
H.C. Rhee and M.M. Salama, Conoco Inc.

4999 **Evaluation of the European Fatigue Test Data on Large- Size Welded Tubular Joints for Offshore Structures**
D.R.V. van Delft, C. Noordhoek, and J. de Back, Delft U. of Technology

5000 **Developments in Fatigue Assessments of Large-Diameter Wire Ropes Used in Offshore Moorings**
D.M. Waters, Natl. Engineering Laboratory, D.G.M. Eggar, BP Intl. Ltd.; and H.T. Plant, British Ropes

5001 **Fatigue Capacity of Large-Scale Plate Girders**
O.I. Eide, S. Berge, and T. Moan, The Norwegian Inst. of Technology

5002 **The Influence of Loading and Environmental Variables on the Seawater Corrosion Fatigue Resistance of Structural and Low Alloy Steels**
S.J. Hudak, Jr. and O.H. Burnside, Southwest Research Inst.

5003 **Corrosion Fatigue Strength of High-Strength Low Alloy Steels for Offshore Structures**
A. Narumoto, K. Akahide, S. Kikukawa, Y. Kawai, and O. Hashimoto, Kawasaki Steel Corp.

WAVE AND CURRENT LOADS, ROOM 124

OTC

5004 **Riser and Vessel Motion Data From Deepwater Drilling Operation**
M.F. Cook and T.N. Gardner, Exxon Production Research Co.

5005 **Full Scale Dynamic Testing Submarine Pipeline Spans**
P.W.J. Raven, and R.J. Stuart, J.P. Kenny & Partners Ltd.; J.A. Bray, U.K. Dept. of Energy; and P.S. Littlejohns, Hydraulics Research Ltd.

5006 **The Vibration of Long Cylinders in Sheared Flows**
J.K. Vandiver and Y. Kim, Massachusetts Inst. of Technology

5007 **Hydrodynamic Forces on a Pair of Cylinders**
A. Bokaian and F. Geoola, U. College London

5008 **Hydrodynamic Forces on Dense Arrays of Cylinders**
J.C. Heideman, Exxon Production Research Co., and T. Sarpkaya, Naval Post Graduate School

5009 **Dynamic Behaviour of Marine Hawsers**
M.R. Parsey, A. Street, and S.J. Banfield, H&T Marlow Ltd.

Wednesday—2:00 to 5:00 p.m.

MARINE RISER SYSTEMS, ROOM 118

OTC

5010 **Unique Triple Tubing Riser System Developed for Completion and Production Testing Subsea Wells**
J.B. Bates, Esso E&P U.K. Ltd., and D.N. Saunders, Shell U.K. E&P

5011 **Articulated Riser for Subsea Production System**
S. Nakamura, and M. Sasaki, Mitsui Engineering & Shipbuilding Co. Ltd.; and K. Kuwabara, Sumitomo Heavy Industries Ltd.

5012 **High Pressure Multi Path (HPMP) Swivel Joint**
J.P. Ghilardi, E.M.H.; C. Dumazy, S.N.E.A.(P.); and S.A. Morris, E.M.H.

5013 **Replacement of a 36-in. Gas Riser Using a Hydraulically Operated Stopple**
H. Torgard, Norpipe A.S., and P.H. Larsen, Phillips Petroleum Co. Norway

5014 **Severe Test of Marine Riser Encountered in 3500-ft. Water Depth**
E. Shanks, Sedco Inc., and K. Schrakenberg, VETCO Offshore Inc.

5015 **Influence of Mud Column Dynamics on Top Tension of Suspended Deepwater Drilling Risers**
J.E. Miller, International Clamp Co., and R.D. Young, Stress Engineering Services Inc.

DRILLING, PRODUCTION, AND COMPLETION TECHNOLOGY, ROOM 114

OTC

5016 **Field Performance of Diver Assist Platform Tiebacks to Subsea Wellheads**
M. Pomfret, Union Oil of Thailand; G. Glidden, FMC S.E. Asia Pte. Ltd.; and C. Cunningham, FMC Wellhead Equipment

5017 **Review of the Top Drive Drilling System on Platform Edith**
T.A. Nagy, Chevron Services Co.

5018 **Design and Installation of 20-Slot Template in the Gulf of Mexico in 750 Ft. of Water**
P.E. Brinkman, G.J. Barbier, and W. Rodriquez, Mobil Oil E&P Southeast Inc

5020 **Guidelineless Deepwater Drilling/Completion System**
L.E. Guthrie, A.M. Regan, and R.A. Meronek, Hughes Drilling Equipment

5021 **Theoretical and Methodological Approaches to Flexible Pipe Design and Application**
J.G. de Oliveira, Conoco Inc.; and Y. Goto and T. Okamoto, The Furukawa Electric Co. Ltd.

FRACTURE CONTROL, ROOM 111

OTC

5022 **ECA Procedures for Reliability of Offshore Welded Construction**
I.J. Smith, and H.G. Pisarski, The Welding Institute; M.M. Salama, Conoco Inc.; and A.P. Smith, The Welding Institute

5023 **Application of Fracture Mechanics Method to Offshore Structural Crack Instability Study**
H.C. Rhee, Conoco Inc.

5024 **Residual Stresses in Cylinder Girth Butt Welds**
A. Scaramangas and R.F.D. Porter Goff, Cambridge U.

5025 **Justification of Enhanced Capacities for As-Welded and Grouted K-Joints**
M. Lalani, Wimpey Offshore Engineers & Constructors Ltd.; P. O'Connor, Amoco (U.K.) Exploration Co.; and I.E. Tebbett, Wimpey Offshore Engineers & Constructors Ltd.

5026 **Effect of Layers in Tubes on Fatigue Crack Growth Rate in Tubular Joints of Offshore Structures**
S.S. Gowda, Technical Research Centre of Finland; and C. Noordhoek and J. de Back, Delft U. of Technology

5027 **Axial Corrosion Fatigue of Wire Rope**
Z. Zimerman and H.S. Reemsnyder, Bethlehem Steel Corp.

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OTC '85

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DYNAMIC RESPONSE TO WIND, WAVES AND CURRENTS, ROOM 107

OTC

5028 **Wave and Motion Measurements on Board the Semi-Submersible Pipelaying Barge LB-200**
L.J. Wevers, and M. Vlaming, TNO-IWECO; and J. Verdonck, McDermott Intl. Inc.

5029 **Measured Dynamic Stress Response of a Semisubmersible Drilling Rig**
T.C. Thuestad, T.D. Hanson, and I. Vik, Norsk Hydro A.S.; and T. Slind, SINTEF

5030 **Nonlinear Dynamic Analysis of a Jacket Type Platform by Ritz Mode Superposition Method**
E.C.P. Lima, L. Landau, N.F.F. Ebecken, and G.B. Ellwanger, Federal U. of Rio de Janeiro

5031 **Dynamic Response of Mono-Tower Platform to Waves and Currents**
V. Jacobsen, and M.B. Bryndum, Danish Hydraulic Inst.; and N.E. Ottesen Hansen, LIC Consult

5032 **Hydrodynamic Forces on Vessels Moored in a Current**
R.Y. Edwards, Jr., Offshore Technology Corp

5033 **Arctic Mobile Drilling Structures in Waves**
S.T. Kalske, T.O. Karppinen, and J.E. Matusiak, Technical Research Ctr. of Finland

OFFSHORE PROCESSING, ROOM 100

OTC

5034 **Effects of Motion on Design of Process Facilities for Floating Production Systems**
C.L. Rice, C-E Natco

5035 **Operational Experience of Running Multi-Casing Gas Compression Trails on a North Sea Offshore Platform**
W.P. Hancock, Mobil Exploration Norway Inc.

5036 **Tanker-Based Marginal Field Production: Eight Years' Operational Experience**
G. Remery, Single Buoy Moorings Inc.

5038 **Brae 'B' Topside Design for Offshore Gas Cycling in the North Sea**
H.J. Wind and K.W. Wiseman, Marathon Oil U.K. Ltd.

5039 **Associated Gas Utilization with Liquids Recovery**
R.S. Hill, Offshore Production Systems Inc.; J.A. Morre, Conoco Indonesia; and D. Boone, Randall Corp.

OFFSHORE DATA COLLECTION AND INSTRUMENTATION, ROOM 124

OTC

5040 **Instrument Control Systems on Brae 'A' Platform**
R. Kumar and G.L. Michael, Marathon Oil U.K. Ltd.

5041 **A Dual-Alternate-Energy Power Generating System for Unattended Offshore Electrical Installations**
D.S. Fridge, Focal Point Assocs. Inc.

5042 **A Systematic Development of Services for Instrumented Structural Monitoring**
S. Flogeland, A.S. Veritec, and C. Ferretti, Tecnomare S.p.A.

5043 **Pressio-Detection for Permanent Jacket Structure Monitoring**
M.J. Blanc and H. Crohas, Total—Compagnie Francaise des Petroles

5044 **Inspection of Hondo Deepwater Platform: Using Microcomputer Offshore**
W. Devine and W.E. Gray, Diverless Systems, Inc.

5045 **Tow Motion Monitoring System Design for the Real World**
C. Campman and F. DeBord, Offshore Technology Corp.

Thursday—9:00 a.m. to 12:00 noon

OFFSHORE INSTALLATION, ROOM 118

OTC

5046 **The Design and Development of the Loadout Procedures for the Lena Guyed Tower**
B.W. Dearing, M.W. Lucas, and C.K. Snell, Brown & Root Intl. Inc.

5047 **Hutton TLP Installation: Analysis and Operation of the Semi-Submersible Assisted Mooring Systems**
G. White, Brown & Root (U.K.) Ltd., J.C. Chivvis, Conoco Inc.; and F.A. Ramzan and D.A. Kypke, Brown & Root (U.K.) Ltd.

5048 **Dynamic Analysis of the Hutton TLP Mating Operation**
D.P. Peace, VO Offshore Ltd.; D.P. Tuturea, Brown & Root (U.K.) Ltd.; N. Ellis, Conoco (U.K.) Ltd.; and J.C. Chivvis, Conoco Inc.

5049 **Design Methodology for Offshore Platform Tieback Conductors**
R.B. Manley, Amoco Production Co.

5050 **Studbolting Experience in the Underwater Environment of the North Sea**
G.A. Scott, Occidental Petroleum (Caledonia) Ltd.

5051 **A Computer Simulation Technique for Offshore Platform Installations**
S.D. Vaughn, Exxon Production Research Co.

ICE FORCES, ROOM 114

OTC

5052 **Probabilistic Design Criteria for Beaufort Sea Structures: Combining Limited Driving Force and Limit Stress Predictions**
J.R. Kreider, ARCTEC Inc.; P.B. Zahn, Marine Technology Corp.; and L.G. Chabot, ODECO

5053 **Ice Force Criteria for Bering Sea Offshore Loading Terminals**
D.V. Padron, Han-Padron Assocs.; W.H. Sackinger, U. of Alaska; and M.T. Faeth, Han-Padron Assocs.

5054 **Ice Forces Exerted on a Conical Structure in the Gulf of Bothnia**
M.P. Maattanen, U. of Oulu, and E.O. Mustamaki, Wartsila Arctic Research Centre

5055 **An Experimental Study on Ice-Structure Interaction**
M. Tsuchiya, S. Kanie, K. Ikejiri, and A. Yoshida, Taisei Corp.; and H. Saeki, Hokkaido U.

5056 **Sea Ice Indentation in the Creeping Mode**
F.S. Chehayeb, S.K. Ting, S.S. Sunder, and J.J. Connor, Massachusetts Inst. of Technology

5057 **Constitutive Modeling of Sea Ice**
V. Chen and V. Vivatrat, Brian Watt Assocs. Inc.

4992 **Characteristic Ice Floe Movements As Revealed By Shore-Based Radars**
C.J. Sonu, Tekmarine, Inc., and M. Aota, Drift Ice Research Inst.

OFFSHORE MOORING LINES AND SUPPORT VESSELS, ROOM 111

OTC

5059 **Anchor Chain Fractures**
A. Taraldsen, A.S. Veritec

5060 **Summary of the 4 Year Research Project: Anchor Chain Cables Offshore**
J. Lereim, Det norske Veritas

5061 **Cyclic Load Testing at Sea Wave Frequency of Continuously Wetted Man-Made Fibre Rope**
H. Crawford and L.M. McTernan, Natl. Engineering Laboratory

5062 **Synthetic Ropes and Cables, Properties and Analysis**
E. Scala, consultants—Columbian Rope Co., and F.J. Haas, Consultants-Columbian Rope Co.

5063 **Synthetic Rope in the Mooring System of the Hutton TLP**
I.A.A. Smith, Global Maritime Ltd.; G.J. White, Conoco (U.K.) Ltd.; and C.S. Collings, Global Maritime Ltd.

5064 **Offshore Platform Maintenance With a Specially Outfitted Vessel**
D.C. Langrock, Mobil R&D Corp.; O.A. Ogunlade, Mobil Producing Nigeria; and A.R. Schuster, Zapata Marine Service, Inc.

SEISMIC WAVES, ROOM 107

OTC

5065 **Reading Micro-Stratigraphy From Seismic Reflection Data**
R.E. Pena, consultant

5066 **Decision-Theoretic and Syntactic Pattern Recognition for the Detection of Bright Spots**
K.Y. Huang, U. of Houston, and K.S. Fu, Purdue U.

5067 **Wave Scattering Deconvolution**
A.K.M. Sarwar, U. of New Orleans

5068 **Multi-Offset VSP Profiling**
F. Mons, L. Horowicz, and K. Babour, Schlumberger

5069 **Seismic Inversion of Vertical Seismic Profile Data for Predicting Abnormal Pressure Beyond TD**
B.E. Shapiro and E.G. Pampell, Schlumberger Offshore Services

HIGH-STRENGTH MATERIALS, ROOM 100

OTC

5071 **A710A: A High-Strength, Low Carbon Alloy Steel for Offshore Applications**
A.D. Wilson and W.G. Taylor, Lukens Steel Co.

5072 **High-Strength Steels With Improved Toughness and Weldability for the Fabrication of Offshore Structures**
B. Muesgen, H. Baumgardt, H. de Boer, and W. Janzon, Thyssen Stahl AG

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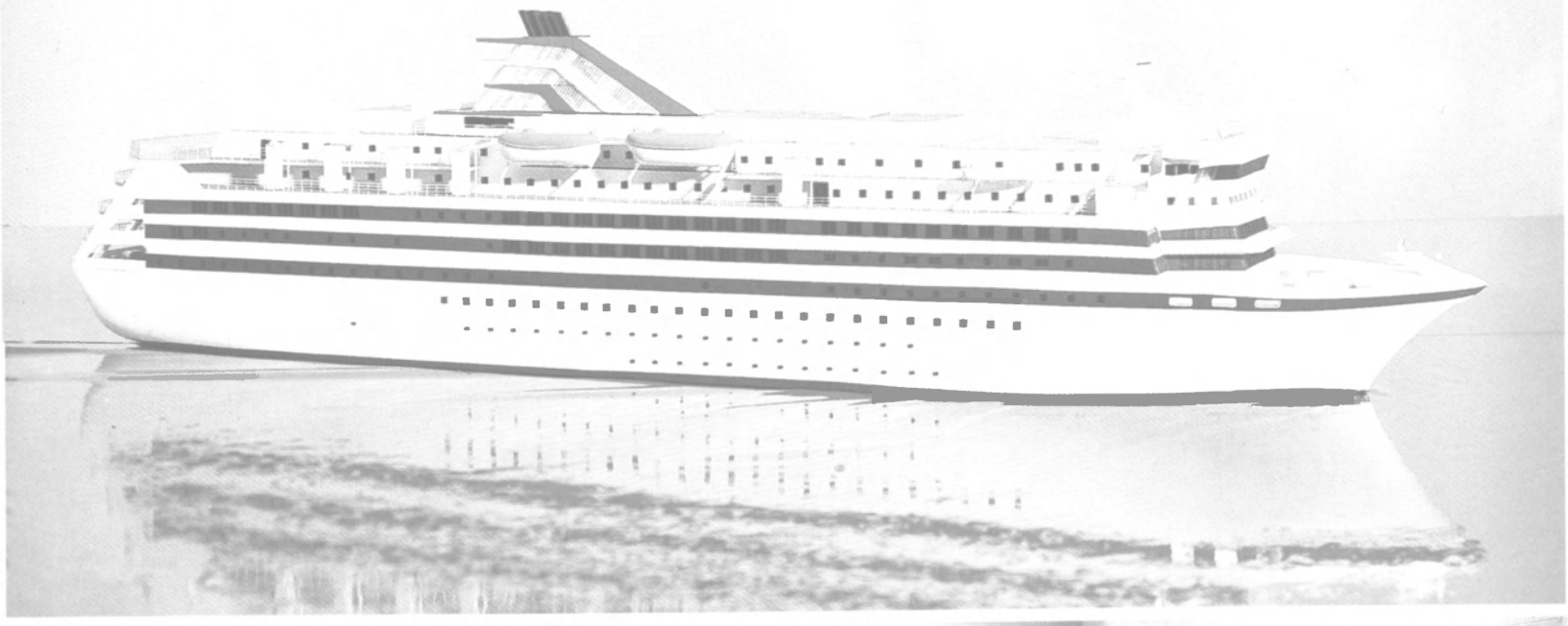

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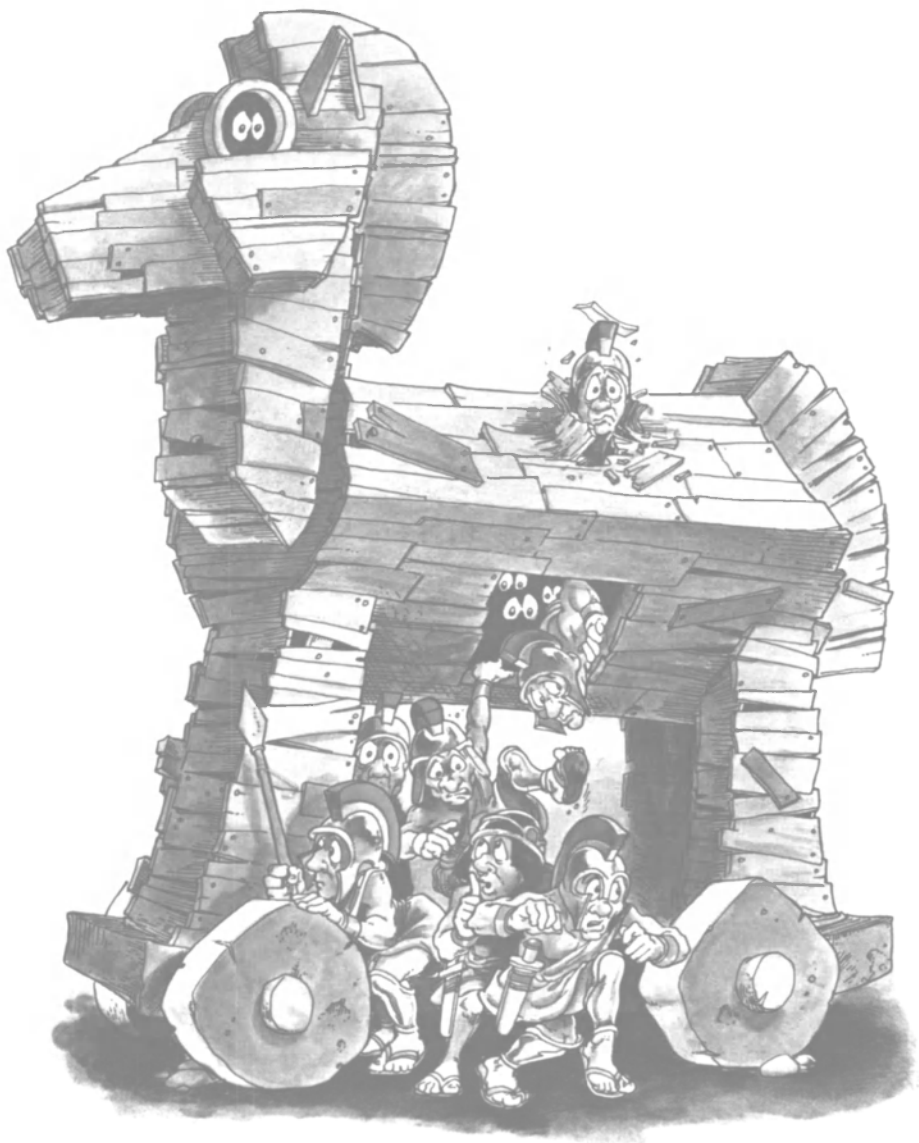

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5083 **Development of High-Strength Steel Plates for Arctic Use**
H. Tagawa, K. Matsui, Y. Yamazaki, S. Sakui, Y. Shironouchi, and K. Matsumoto, Nippon Kokan K.K.

5073 **High-Strength Concrete Development and Potentials for Platform Design**
J. Moksnes and B. Jakobsen, Norwegian Contractors

5074 **Research and Development of Three Piece Tendon for TLP**
Y. Takeshi and H. Mimura, Nippon Steel Corp.

5075 **Tubular Tendon for Tension Leg Platform: Material Development and Threaded Connection Design**
D. Dutta and W. Wendler, Mannesmannroehren-Werke AG

SAFETY AND ENVIRONMENTAL CONSIDERATIONS, ROOM 124

OTC

5076 **Offshore Platform Abandonment: A Contemporary Issue**
G.H. Sawyer, Esso Europe Inc.

5077 **An Offshore Evacuation System: A Safe Haven and an Emergency Control Centre**
B. Bengtsson, GVA von Tell Lifescape HB, and S. Thulin, Gotaverken Arendal AB

5078 **Drilling Operations Under No-Discharge-Of-Pollutants Regulations in Mobile Bay, Alabama**
L.A. Carlton and J.B. Darby, Exxon Co. U.S.A.

5079 **Passive Hydrocyclones for Treatment of Oil Water Prior to Discharge Into the Environment**
B. Carroll, BWN Industries; P. Henderson, Esso Australia Ltd.; and G. Prendergast, BWN Industries

5080 **Trends in Passive Fire Protection Favor the Use of Ceramic Fiber Systems**
E.J. Peters, Carborundum/Sohio

5081 **Radioactive Scale Formation**
A.L. Smith, Occidental Petroleum (Caledonia) Ltd.

TIMETABLE
TECHNICAL SESSION

Monday Morning—9:00 a.m. to 12:00 noon
- Sedimentary Basins I—Origin and Evolution
- The Challenge of Deep Water
- Pile Foundations
  - Structural Engineering, Design and Analysis 1
- Seismic Data Acquisition
- Welding and Fabrication

Monday Afternoon—2:00 p.m. to 5:00 p.m.
- Sedimentary Basins II—Trap Sytles and Reserves Assesment
- Field Development
- Foundation Behavior
- Structural Engineering, Design and Analysis II
- 3-D Seismic
- Marine Mining and Ocean Minerals

Tuesday Morning—9:00 a.m. to 12:00 noon
- Marine and Exploration Geology
- The Hutton TLP
- Soil Investigation and Island Construction
- Pipeline Technology
- Seismic Resolution
- Oceanography and Meteorology

Tuesday Afternoon—2:00 p.m. to 5:00 p.m.
- Arctic Operations
- Hutton TLP—Equipment and Instrumentation
- Wind and Wave Forces
- Subsea Production Facilities
- Seafloor Surveying and Mapping
- Corrosion Control

Wednesday Morning—9:00 a.m. to 12:00 noon
- Fiber Optics and Cables
- TLP Technology
- Mobile Offshore Drilling Units
- Navigation Systems
- Fatigue
- Wave and Current Loads

Wednesday Afternoon—2:00 p.m. to 5:00 p.m.
- Marine Riser Systems
- Drilling, Production and Completion Technology
- Fracture Control
- Dynamic Response to Wind, Waves and Currents
- Offshore Processing
- Offshore Data Collection and Instrumentation

Thursday Morning—9:00 a.m. to 12:00 noon
- Offshore Installation
- Ice Forces
- Offshore Mooring Lines and Support Vessels
- Seismic Waves
- High-Strength Materials

- Safety and Environmental Considerations

OTC '85
List of Exhibitors

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OTC '85

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ANDERSON STRATHCLYDE PLC 6560
APPLETON MARINE 2025
APRAM 2821
AQUA-DYNE INC. 7065
AQUA MAGNETICS INTERNATIONAL, INC. 4486
AQUAFINE CORP 6265
ARCTEC INC., OFFSHORE TECHNOLOGY CORP. 5668
ARMATURENFABRIK ERNST HORN GMBH 6642
W.B. ARNOLD CO. INC. 4070
ARROW GEAR CO. 4671
ARROW OIL TOOLS, INC TECHNOLOGY EXPORT CO 6670
ASCO ENGINEERING 6575
ASCO PROPERTIES 6575
ASCO TRANSPORT 6575
ASEA HAGGLUNDS, INC 4145,339
ASEA-PER KURE A/S 5252
ASFOR 5037
ASSOCIATION OF BRITISH OFFSHORE INDUSTRIES LTD 6455
ASTEO 5050
ASTILLEROS CORRIENTES 7757
AT&T COMMUNICATIONS 4092
ATEL 2821
ATKINS RESEARCH AND DEVELOPMENT 6449
ATLANTIA 6150
ATLANTIC GULF & PACIFIC CO OF MANILA, INC 4197
NL ATLAS BRADFORD 5011
ATLAS DANMARK A/S 3543
AUSTRIA TRADE COMMISSION 6649
AUTOCON, INC 5006
AUTOKON DATA A/S 5338
AUTOMATED CONTROLS, INC 4484
AUTOMATED FLUID SYSTEMS 4301
AUTOMATIC POWER, INC. 6127
AVA INTERNATIONAL 7145
AVCO LYCOMING 3653
AVESTA STAINLESS INC 4065,4165
AXELSON, INC. 7841

B

B B C 4557
B C MANUFACTURING, INC 534
B C INTERNATIONAL CORP
B W N VORTOIL 3443
BADGER MINING CORP 4389
BADO EQUIPMENT CO., INC 6393
BAKELITTFABRIKKEN A/S SKAN MARIN 5251
BAKER INTERNATIONAL CORP 3101,3215
BALDT INC 5395
BAND-IT HOUDAILLE 3352
NL BAROID 5011
NL BAROID LOGGING SYSTEMS 5011
BARTON VALVE CO., INC. 7855
BASF WYANDOTTE CORP 2663
BASSIN D'ESSAIS DES CARENES 2853
BAY SHIPBUILDING CORP 6321
BAYLEYSUIT INC 5487
BAYLOR, A NATIONAL SUPPLY CO 4505
BEARINGS, INC 6189
BEAUDRIL LTD 4015,411
BEAUFORT AIR-SEA EQUIPMENT 2733
BECHTEL GREAT BRITAIN LTD 6475
BECHTEL PETROLEUM, INC 6057
PMB SYSTEMS ENGINEERING INC
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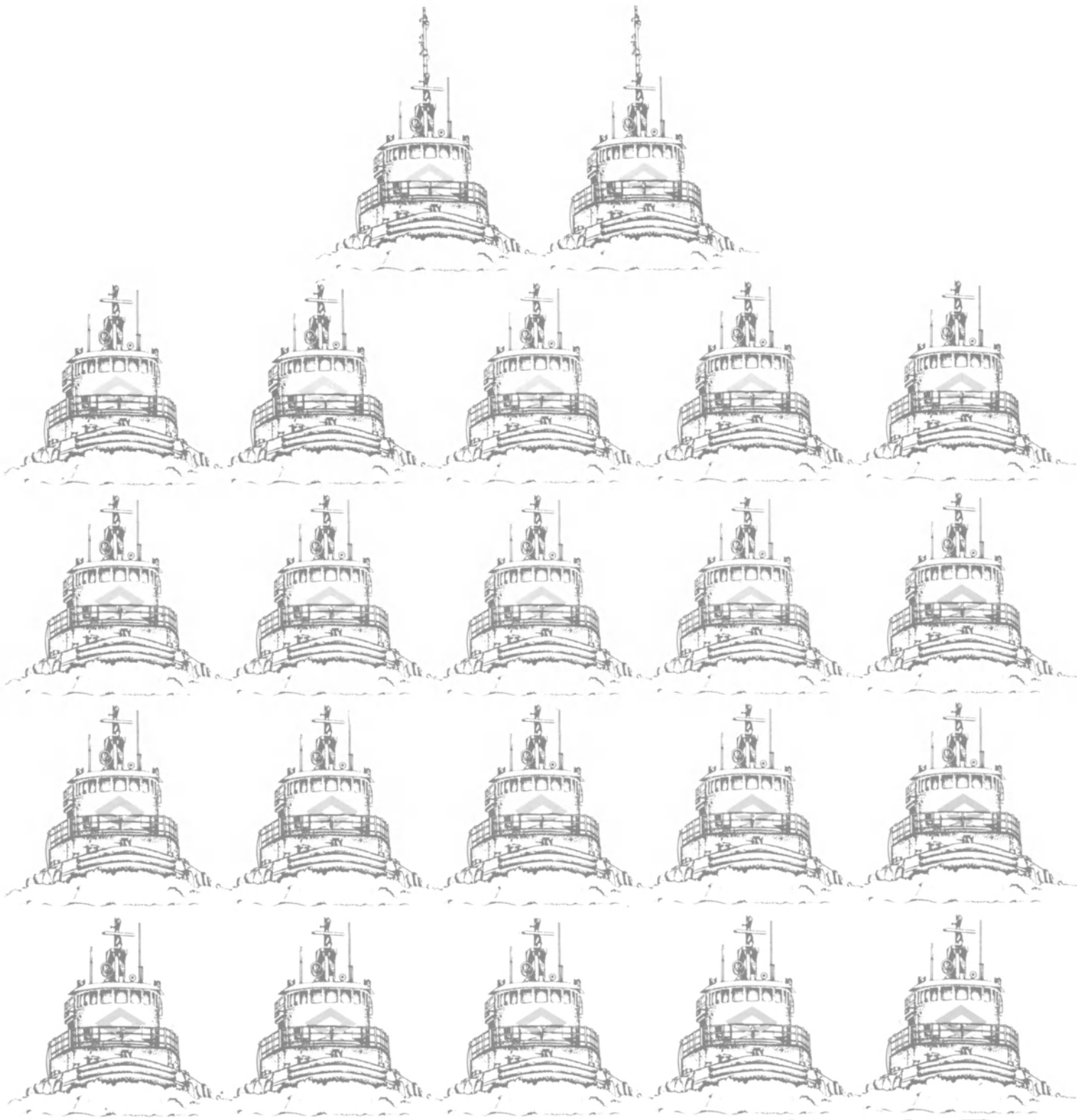

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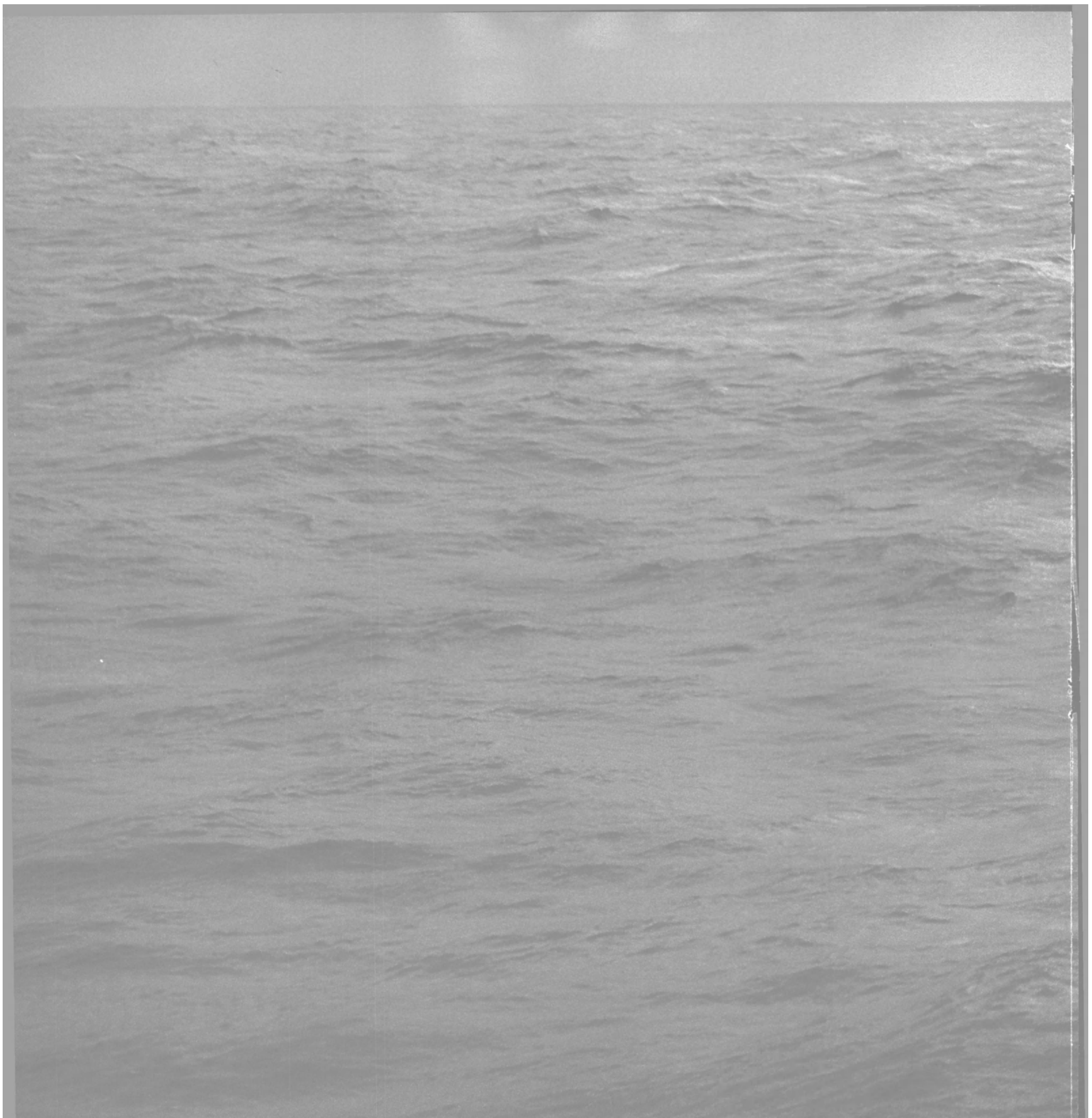

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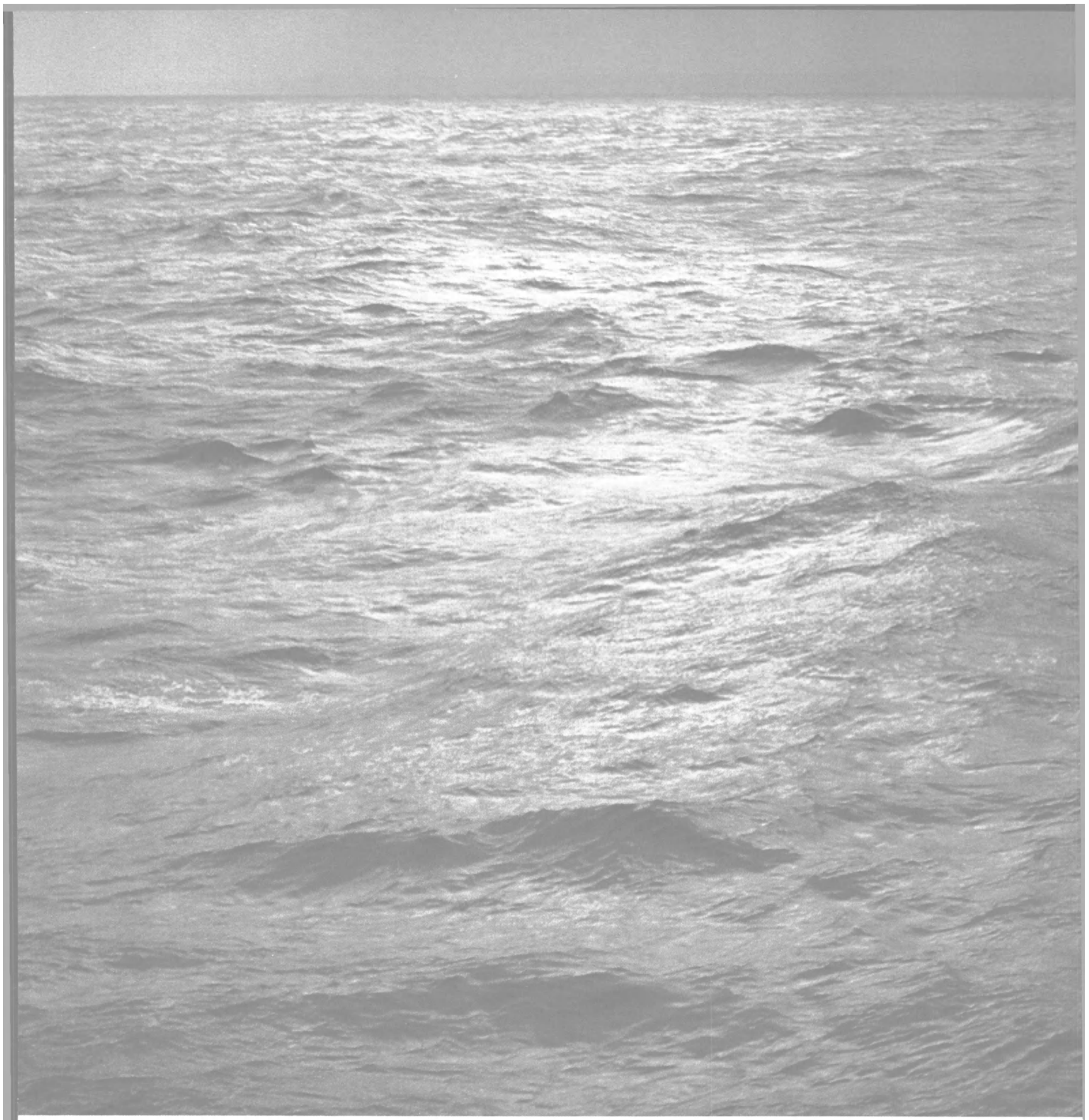

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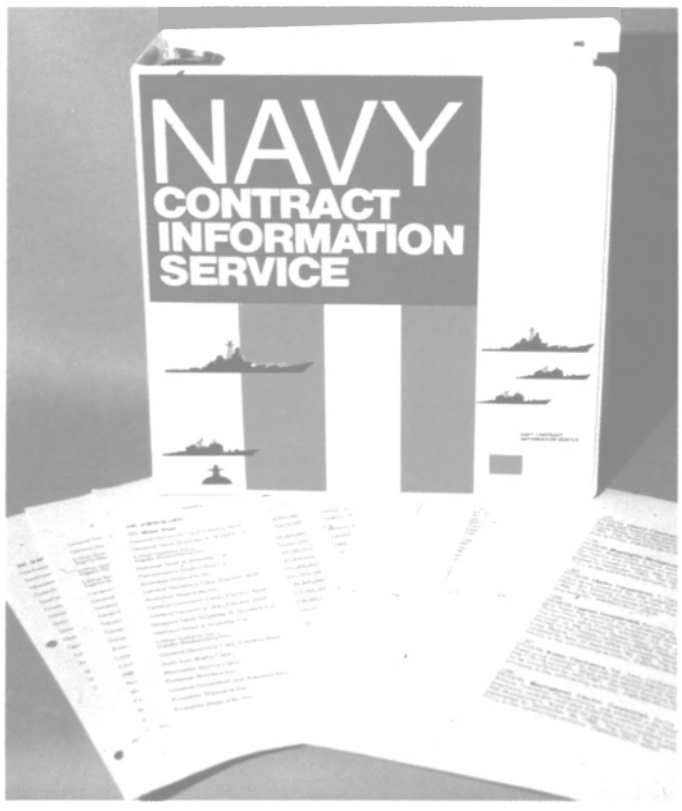

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"We have well over 20,000 maritime and offshore installations to prove the and oil sludge incinerators"

Jens Faber Andersen
Vice President
Atlas-Danmark Marine & Offshore

No other manufacturer can beat that figure!

Atlas-Danmark was the inventor of the freshwater generator utilizing waste heat to convert seawater into fresh water.

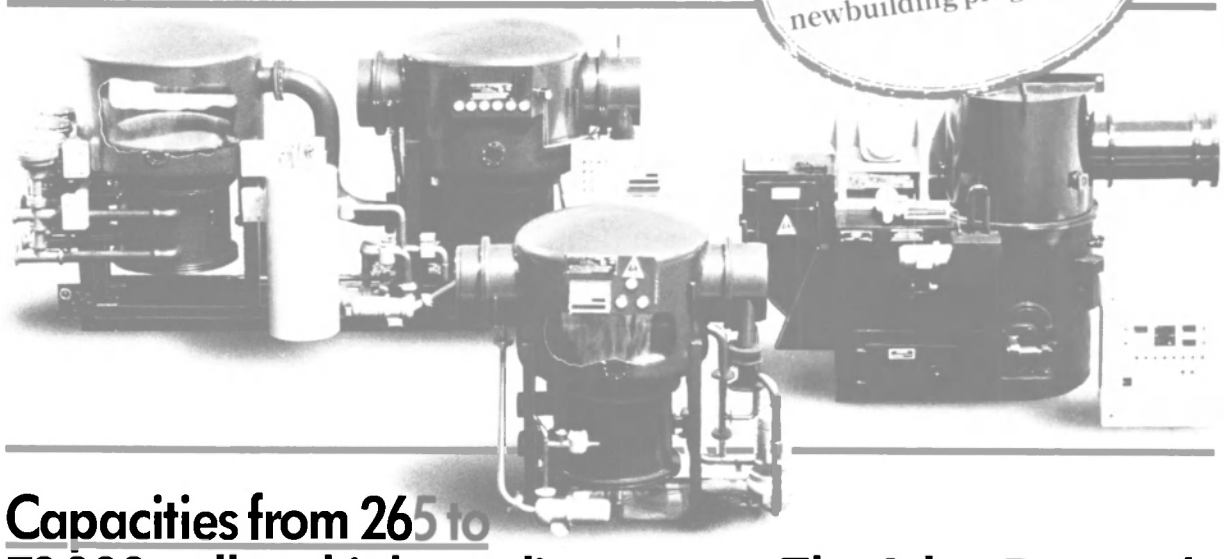
Today, 7 in 10 vessels throughout the world – and about 5 in 10 offshore installations – depend on an Atlas-Danmark Freshwater Generator, type AFGU, – or water maker – for their daily supply of high-quality fresh-water. And they have plenty of water.

In the increasingly important field of pollution control at sea we can offer a range of fully automatically operated incinerators for burning of any oil and sewage sludge with a water content of up to 60% without additional oil supply. Our incinerators can also be supplied for simultaneous burning of solid waste, if desired.

Our incinerators of course comply with the MARPOL 73/78 regulations, but they have also been designed to meet even the strictest future rules.

All in all, we believe it would be a wise decision to talk to us for your next water maker or incinerator installation. We have an international service organization and maintain spare part stocks worldwide, including the U.S.A. and Canada.

Approved by ABS and all leading Coast Guards. Selected for the US Navy newbuilding programme.



Capacities from 265 to 70,000 gallons high-quality fresh water per 24 hours

Single-Effect Freshwater Generators

CAPACITY 1-100 TONS/24 H FRESH WATER (265-26,500 gal/24 H)

12 different sizes of the Single-Effect Freshwater Generator, type AFGU 1, ensure the most reliable and economic solution to any demand for supply of high quality fresh water on board any merchant vessel. Up to 15 tons/24h fresh water per 1,000 BHP Diesel engine can be produced by the Single-Effect Freshwater Generator, type AFGU 1, when utilizing the jacket cooling water of the engine as heating medium.

Double-Effect Water Makers for offshore installations

CAPACITY 35-265 TONS/24H FRESH WATER (9,000-70,000 gal/24 H).

The Atlas-Danmark Double-Effect Freshwater Generators, type AFGU 2, produce almost twice the amount of fresh water per kW waste heat utilized compared to the Atlas-Danmark Single-Effect Freshwater Generators type AFGU 1. The complete range of 7 different sizes of freshwater generators, type AFGU 2, may be supplied as fully automatic, compact skidmounted units for direct hook up to 1, 2, 3 or 4 Diesel engines. More than 30 tons/24h fresh water per 1,000 BHP Diesel engine may be produced by the Double-Effect Freshwater Generators, type AFGU 2, when utilizing the jacket cooling water of the engine as heating medium.

Atlas-Danmark also supplies 3, 4, 5, and 6-Effect plants with capacities up to 1,000 tons (265,000 gallons) per 24H per unit.

The Atlas-Danmark 402 Incinerator Programme

ASWI 402

Fully automatically operated incinerator for burning of any oil sludge and sewage sludge from the sludge tank + simultaneous burning of solid waste fed continuously through a non-flareback sluice.

Capacity
Max. 100 l/h (26.5 GPH mix sludge oil and sewage sludge.
Max. 50 kg/h (110 lbs/h) solid waste

Temperatures

First and secondary combustion chamber:	Max. 1050° C (1922° F)
Flue gas outlet:	Max. 350° C (622° F)
Outside surface:	5° C (9° F) above ambient temperature.
Negative pressure in combustions chambers:	20 mm WG (0.8 in WG)
Max. pressure loss in funnel without flue gas fan:	30 mm WG (1.2 in WG)

The ASWI 402 A and ASI 402 has the same oil sludge burning capacity. ASI 402 has no solid waste burning.

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Circle 135 on Reader Service Card

Ship Financing Reforms Announced By Secretary Of Transportation Dole

Secretary of Transportation **Elizabeth H. Dole** has announced a series of reforms and improved criteria for Federal guarantees of private sector financing to construct, reconstruct, or rehabilitate vessels in U.S. shipyards.

A new rule details amendments to the regulations implementing Title XI of the Merchant Marine Act of 1936. The Title XI assistance program has a statutory ceiling of $9.5 billion on guarantee authority; outstanding guarantees currently total $7.2 billion. The changes in the Title XI program, which is administered by the Department's Maritime Administration, became effective on April 8 this year.

"These new procedures should assist both the applicants and the Department in preparing and evaluating Title XI applications in the most efficient, cost-effective, and equitable manner possible," said Secretary **Dole.** Maritime Administrator **Harold E. Shear** said, "These important revisions to the Title XI regulations and procedures will bring the program more in line with commercial practices."

The new regulations will, among other things:

Require more detailed assessments of the economic viability of the Title XI applicant's project and the vessel supply/demand inventory in the trade in which the vessels will operate;

Require an applicant to demonstrate that the Title XI project will generate at least a 10 percent internal rate of return;

Strengthen the financial criteria that applicants must meet, including increased levels of equity investment;

Tighten requirements that must be met by financially troubled companies that seek financial assistance from the government to service Title XI debt; and

Increase the applicants' Title XI investigation (application) fees from the previous one-eighth of one percent to one-half of one percent of guarantee amounts up to and including $10 million. Any guarantee amount exceeding $10 million will carry a fee of one-eighth of one percent.

'Silver Anniversary' For Atlas Freshwater Generator And Knutsen Vessel

The Arnessen Corporation of New Jersey, U.S. representatives of Atlas-Danmark Marine & Offshore, a Division of Atlas-Danmark A/S, reports that they believe Atlas-Danmark has an operating record for one of their freshwater generators.

In 1959, an Atlas-Danmark freshwater generator (serial No. 281) was installed onboard newbuilding No. 746 of Gotaverken, Sweden. The vessel, the Martha Bakke, was delivered to the Norwegian shipowner Knut Knutsen of Haugesund. The Martha Bakke was later converted into a "floating warehouse," renamed Knut Supporter, and is at present working in the Southeast Asian oil fields.

The "marriage" turned out to be a happy and very smooth one. The last call for an Atlas-Danmark service engineer was actually during installation in 1959, and the costs of service have been negligible during these 25 years. According to **K. Leite**, chief engineer of the Knut Supporter, the vintage Atlas-Danmark freshwater generator is in first-class condition and still produces the nominal 21 tons of fresh water per 24 hours.

In 1955, Atlas-Danmark developed the first freshwater generator utilizing waste heat from the ship's engines to convert seawater into high quality fresh water. More than 17,000 units have been installed worldwide, and the current program comprises a number of models for marine and offshore installation with capacities ranging from 1.5 to 1,000 metric tons per 24 hours.

For more information on the Atlas-Danmark freshwater generators marketed in the U.S. by Arnessen Corporation,

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Circle 168 on Reader Service Card

Gulf Coast Shipyards

A Facilities Review

ALUMINUM BOATS

Aluminum Boats, Inc., is a new shipyard in south Louisiana that is rapidly earning a reputation for high-quality construction and repair of aluminum boats at reasonable prices. As the name indicates, the shipyard specializes in the construction and repair of a wide variety of all-aluminum vessels.

Located at Crown Point, La., close to the Gulf of Mexico and New Orleans, the shipyard has already built and delivered eight new vessels, and modified four others since its establishment in 1983. Three additional boats are under construction now for 1985 delivery.

Aluminum Boats, Inc., set a record recently by building and delivering two 85-foot crew/utility boats within 12 weeks. **Salvador J. Guarino,** president of the company said that quick deliveries such as these are indeed a challenge, but they are welcomed as they have proven his shipyard's ability to respond quickly to customer needs.

Included in Aluminum Boats' new construction deliveries are: one 115-foot crew/utility boat; three 85-foot crew/utility boats; one 78-foot, and one 65-foot crew/utility vessel; and two 110-foot security vessels. In addition, the shipyard has added a 12-foot mid-body section to a 100-foot crewboat for additional tankage, and converted two 77-foot crewboats and one 100-foot crewboat to ferries for use in Boston harbor.

Aluminum Boats, Inc., is currently building three boats; a 150-passenger, 87-foot whalewatch excursion boat for use off Provincetown, Mass; a 110-foot crew/utility boat for use in the Middle East; and a 100-passenger, 95-foot, triple-screw, crew/utility vessel, also for use in the Middle East.

Mr. **Guarino** pointed out that his vessels carry the designation "crew/utility" as those so designated are outfitted with tanks and other equipment which extend their use beyond the water taxi mode.

Aluminum Boats, Inc., also operates an efficient, rapid response spare parts and replacement parts program which is based on Mr. **Guarino's** more than 30 years' experience as a marine purchasing agent. He served as chief purchasing agent for a major shipyard for 16 years and was president of a marine and industrial supply company. Mr. **Guarino** said his company welcomes inquiries from clients and non-clients alike.

The shipyard occupies the site of the former Camcraft, Inc., on the Intracoastal Canal. It is equipped with covered manufacturing facilities, high-capacity overhead cranes, and all of the equipment required for high quality production.

"We received another distinct advantage by locating at the former Camcraft facility," said Mr. **Guarino.** "Most of our shipbuilders were employed by that company, and they are highly trained and skilled craftsmen. They take great pride in the quality of their work, and I think we build the best aluminum boat you can buy."

Principal officers are **Salvador J. Guarino,** president, and **Ken Deshotel,** CPA, secretary and treasurer.

Circle 61 on Reader Service Card

AVONDALE SHIPYARDS

Avondale Shipyards, Inc. near New Orleans is continuing with the construction and conversion of six vessels, including the newbuilding of two T-AO-187 Class fleet oilers for the U.S. Navy, two T-5 forebodies under subcontract from American Ship Building of Tampa, and the conversion of two SL-7 containerships into T-AKR service for the Military Sealift Command. In addition, the yard is constructing three large, gas-turbine-driven, modularized compressor skids for industrial service. All work is either on or ahead of schedule.

Two additional T-AO-187 Class ships and three dock landing ships of the LSD-41 Class are also under contract, and construction will start late this year and in 1986. Avondale also has an option, to be exercised by the Navy when funding becomes available, for two additional LSD-41s. Areas of future interest include the lead ships of the AOE-6 and AE-36 Classes, as well as the follow-on ships of the LSD-1 and DDG-51 Classes.

Avondale is also continuing its program of productivity and facility improvement, resulting in a continuation and increase in the cost savings that have been previously experienced. The yard initiated the transfer of Japanese technology in late 1979. The development of this technology, which has resulted in dramatic savings, is continuing with the further refinement of the system to adapt to the domestic environment, increased use of computers for design, construction, and management, and to more effectively accommodate the greater complexity of Naval vessels.

Engineering improvements include the more effective application of modularization and packaging, improvement and more extensive use of standards, the commercialization of non-mission-oriented Military Specifications, continued refinement of CAD/CAM, and the improved application of the yard's advanced material control system, COPICS. Improvements in logistic support, cost/schedule control, quality assurance, and other Naval shipbuilding disciplines continue.

New facility improvements include a lifting and turning frame with a lift capacity of 250 tons to handle and turn over large pre-outfitting assemblies, three new 130-ton revolving cranes, the switch to two numerically controlled plasma arc burning machines, and a new beam fabrication line to save structural weight and cost.

The award of contracts and the progress of these contracts is proceeding well, but added work is required if the yard is to maintain economical levels of employment and properly utilize the continuing investment in facilities and improved technology.

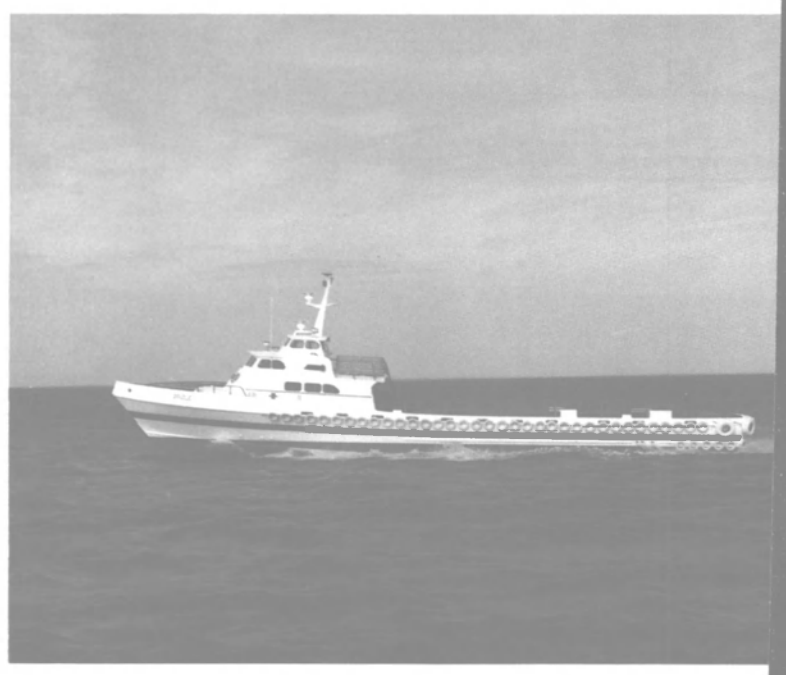
Avondale maintains seven drydocks for major conversions, major repairs, and the quick turnaround of offshore oil and inland waterways vessels. The largest dock is capable of lifting 81,000 tons. This dock is 900 feet long on the platform, with 220 feet between wing walls, making it capable of lifting the largest vessels, including semisubmersible rigs, that can transit the Mississippi Riv-

(continued from page 80)

Port Allen Marine

Moss Point Marine

Oriole—Aluminum Boat



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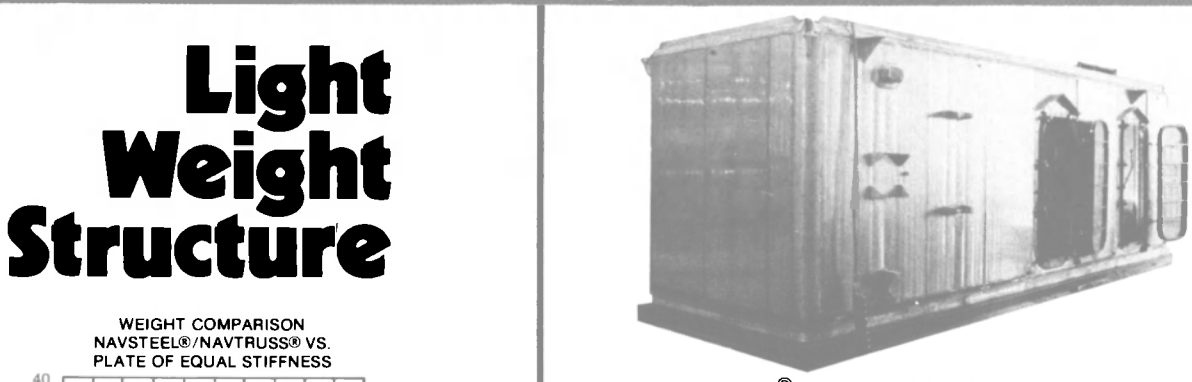

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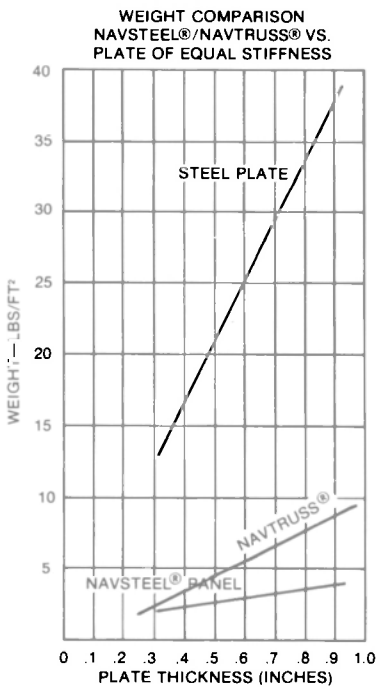

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Ocean Enterprise—Bender

Gulf Coast Yards

(Avondale continued)

er. Up to 37 feet of water can be obtained over the blocks.

The other major dock is a Panamax floating unit with a lift capacity of 20,000 tons and a length over the blocks of 656 feet. Both docks are U.S. Navy certified. All repair services are offered, including the rubber lining of tanks and 600-ton heavy-lift services. Full new construction engineering support services are available for repair clients

Circle 62 on Reader Service Card

BENDER

Despite the low level of activity in the marine industry, Bender Shipbuilding & Repair Company of Mobile, Ala., continues to maintain its position as one of the nation's leading builders of the new breed of trawler/processor vessels. These boats catch, clean, freeze, and package their fish within minutes, and deliver to dockside the freshest possible ready-for-market product.

Recent deliveries include two 115-foot trawlers for Pacific Enterprise of Seattle, and two 133-foot trawler/processors for **Pete Njarvik,** also of Seattle. Two additional trawler/processors are currently under construction.

Other deliveries include the 192-foot cruise vessel Pilgrim Belle for Coastwise Cruise Lines of Hyannis Port, Mass., and a 98-foot scalloper for **Jakob J.** and **Jarry Shervo** of New Bedford, Mass.

Improvement and expansion of Bender's ship-repair facilities include the recent addition of a floating drydock with a lifting capacity of 18,000 tons. The new drydock will enable the Mobile yard to accommodate an even larger capacity of ships that are expected to pass through Mobile with the recent opening of the Tennessee-Tombigbee Waterway.

Currently at Bender is the Patroit State (ex Santa Mercedes) that is being converted into a training ship for use by the Massachusetts Maritime Academy under a $5,643,778 contract awarded by the Maritime administration. Also at the yard are two Tidewater Marine offshore supply vessels that are getting new 16-foot sections to expand their cargo-carrying capacity.

With an aggresive sales approach, Bender plans to promptly meet the repair and overhaul needs of the maritime industry, and to deliver state-of-the-art steel vessels that can compete successfully in today's market.

For more information,

Circle 82 on Reader Service Card

BLUE STREAK INDUSTRIES

Anyone driving near, or flying over, the Blue Streak Industries, Inc., shipyard would be impressed

Lift Boats—Blue Streak

by the 12 tall steel legs or columns piercing the sky. The legs are attached to four self-elevating, self-propelled lift boats which are currently at the facility for annual inspections and overhaul.

The hydraulically operated legs are lowered to the ocean floor making the boat a stable platform from which a variety of work is performed.

A closer look will also reveal nine additional huge legs being fabricated for three new lift boats that are also under construction at the Pearlington, Miss., shipyard.

At water's edge crews are install-

ing 260 feet of concrete bulkhead, and others are working on a new line of lightweight, high-lift-capacity marine cranes which will soon be introduced to the marketplace.

The shipyard occupies an 18-acre site and is staffed by 122 shipbuilders who can produce in excess of one vessel per month. As the pilothouses and cabins of lift boats are made of aluminum, and the hulls are constructed of steel, the yard has the necessary equipment and facilities for the construction and repair of both steel and aluminum vessels.

Blue Streak Industries was established in January 1978, at Chalmette, La., by **Dennis L. Good,** president and owner. The yard began building a variety of aluminum and steel workboats. As the demand for larger lift boats increased, the company outgrew its suburban New Orleans facility and moved its lift boat production to a new, larger site at Pearlington, Miss. In 1979, Mr. **Good** decided to specialize in lift boat construction and maintenance, and all activities were shifted to the Mississippi operation. It is located on the East Pearl River which provides quick, easy access to the nearby Gulf of Mexico.

Today Blue Streak Industries, Inc., is the nation's largest builder of self-elevating, self-propelled lift boats. The company offers lift boats with legs from 75 feet to 200 feet with crane capacities of 10 tons to 100 tons. Quarters and galley facilities for 14 to 42 people can be provided, and electrical generation capacities range from 40 kw to 300 kw.

The boats are designed and built at Blue Streak Industries, Inc., P.O. Box 92, Pearlington, Miss. 39572. The phone number is (601) 533-7892.

Blue Streak also has manufacturing license agreements with Sing Koon Seng (PTE) Limited of Singapore, and Montreal Engenharie S. A. of Rio De Janeiro.

Circle 63 on Reader Service Card

BOLLINGER

Thirty-eight years of experience provided much of the groundwork toward growth patterns for Bollinger Machine Shop & Shipyard, Inc. in Lockport, La. The New Construction Division there is busy on a government WPB contract that should take some 33 months to complete. The first of the U.S. Coast Guard's new 110-foot patrol boats is expected to be delivered on August 4 this year, and at 45-day intervals thereafter.

The contract awarded August 8, 1984 calls for 15 patrol boats, based on the internationally known 110-foot Vosper-Thornycroft design. The cutter's superstructure and living areas have been redesigned to meet Coast Guard needs. Its operating capability, endurance, and habitability will vastly exceed that of any 82- or 95-foot patrol boat currently employed by the Coast Guard.

Improvements in the accommodations include the use of sound-deadening and isolation-dampening

Right—The 'Big D' dock at Bollinger's La-Rose Division

treatments, expanded deck space, and more crew storage capacity. An active-fin roll stabilization system is used to improve seakeeping characteristics. The value of the contract to Bollinger was some $79,000,000.

A new addition to Bollinger's La-rose Division is a 3,500-ton drydock that was officially operative on No-

(continued on page 82)

Gulf Coast Yards

(Bollinger continued)

vember 16, 1984. Christened the Big D after chairman of the board **Donald G. Bollinger,** the new dock is 200 feet long with an 18-foot draft, and measures 81 feet between the wing walls.

Special features of the new dock include ten 4,000-gpm pumps, four 1,000-gpm stripping pumps, shore power hook-ups, floodlights, air-operated valves for submerging, and a 57-foot trolley system that allows the dock to be moved out into the slip and to submerge to haul up 300-foot-long vessels. With this latest addition, Bollinger-Larose now has three drydocks to offer to its customers.

The company's Lockport Marine Repair Division has six ways to handle haul-ups; the latest, No. 6 ways, can handle supply boats of up to 165 feet in length. The current project on that ways is a 165-foot supply belonging to Cheramie Brothers that is being lengthened to 186 feet. A 21-foot midbody to carry liquid mud and calcium chloride is being prefabbed and will be installed forward of the engine room. A bow thruster and two 500-cubic-foot bulk mud tanks are also being installed.

For more information,

Circle 83 on Reader Service Card

CONRAD INDUSTRIES

In continuous operation since its founding in 1948, Conrad Industries, Inc. is located at the junction of the Intercoastal Canal and the Atchafalaya River in Morgan City, La. The yard has river frontage of more than 500 feet, plus a dredged basin 320 by 100 feet that is used for dockside repairs as well as loading and unloading. The entire area is bulkheaded, and compacted and shelled for heavy traffic. Approximately 90 percent of the 5.4-acre yard is concreted.

Conrad specializes in boat repairs, and in barge and miscellaneous construction. Servicing the boat repairs are two floating drydocks, each with a lifting capacity of 1,500 tons and dimensions of 120 by 70 feet, and two 120- by 52-foot drydocks rated at 900 tons each. All are new and were built at the yard.

Two crawler cranes of 50- and 40-ton capacity, and a 20-ton cherry picker are permanently on site; heavy-lift equipment is readily available. Services for propeller reconditioning, machining, electrical, carpentry, and other work are provided.

Sandblasting and painting are performed with ample and convenient equipment. Three 40,000-pound sand hoppers are located near the drydocks, and 2,400 cubic feet of air per minute is piped throughout the yard.

New construction is done indoors in two buildings. One is 360 feet long, 100 feet wide, and 45 feet high; the other is 200 by 80 by 28 feet. Overhead cranes handle the materials needed for the variety of barges, drydocks, and miscellaneous vessels built here. More than 100 welding machines of various types are available, as well as special tools for greater efficiency.

Circle 64 on Reader Service Card

GRETNA MACHINE

Gretna Machine & Iron Works, Inc. is a wholly owned subsidiary of Trinity Industries of Dallas specializing in barge construction, repair, and gas-freeing, as well as steel fabrication. The Harvey, La., yard has been in business for 25 years, and normally has a work force of approximately 350, manning two shifts

The Gretna Yard in Harvey, La.

per day. The facility covers 47 acres and includes two barge graving docks, outside platen area, and steel fabrication and pipe shop. Two galvenizing plants are located nearby.

The new-construction graving dock is 600 feet long and 100 feet wide. It is served by a 50-ton portal crane traveling the length of the dock and a pre-fabrication platen area. A graving dock measuring 300 by 100 feet is used primarily for repairing river barges. The yard has a complete gas-freeing plant, with steaming, Butterworthing, and flaring facilities. The fabrication shop includes automatic welding and burning equipment, plate shear, press brake, and pipe-bending equipment.

Gretna's new-construction work has been confined mainly to large oceangoing barges, many of them designed by the yard's in-house naval architects and engineers. This leads to less expensive construction due to incorporating many in-house standards into the designs. The yard has also built highway bridge caissons.

Repair and gas-freeing work concentrates on river vessels, due to the yard's strategic location on the Harvey Canal near the meeting of the Mississippi River and the Intracoastal Canal.

Circle 65 on Reader Service Card

HALTER MARINE

Halter Marine is operating six shipyards in the U.S. Gulf Coast area. When combined, the current workload at all six yards makes Halter a leader on the Gulf Coast.

In addition, Halter has supplemented its normal oil field supply vessel and crewboat business with a sizeable quantity of work for the military. Halter is building a solid Booster recovery vessel for Lockheed and the Air Force at its Moss Point Yard, and it recently delivered a 65-foot utility boat for the U.S. Navy from its Chalmette Yard. The Chickasaw yard completed a jumboizing of the Moana Wave for the University of Hawaii who operate the vessel for the U.S. Navy, and the Industrial Canal Facility is heavily involved in the WPB Program by cutting all the steel and building the aluminum main decks for the patrol boat builder, Bollinger Shipyards of Lockport, La.

Innovative tugboats are presently under construction at Halter's Lockport facility for Otto Candies, and the company has under construction, for stock, a large supply vessel at its Moss Point yard. Two stock crewboats are under construction at the Chalmette yard, in addition to present contract work underway.

Jack Edwards, president of Halter Marine, told his management team that the company is in an excellent position to be competitive on any vessel of a size Halter can build. He told of plans to further consolidate the facilities and mentioned that Bell-Halter, the company jointly owned by Halter and Bell Aerospace have agreed to a lease on Halter's Chef yard. Halter's corporate office, presently located at the chief yard will move to new quarters in East New Orleans.

Halter has its own Engineering Department, giving Halter the ability to design a vessel to the owner's requirements, however unique. In addition, changes to the vessel to meet changing market conditions or owner's preferences as construction progresses may be accomplished with the minimum of disruption to

(continued on page 84)

Halter's Lockport Yard

Gulf Coast Yards

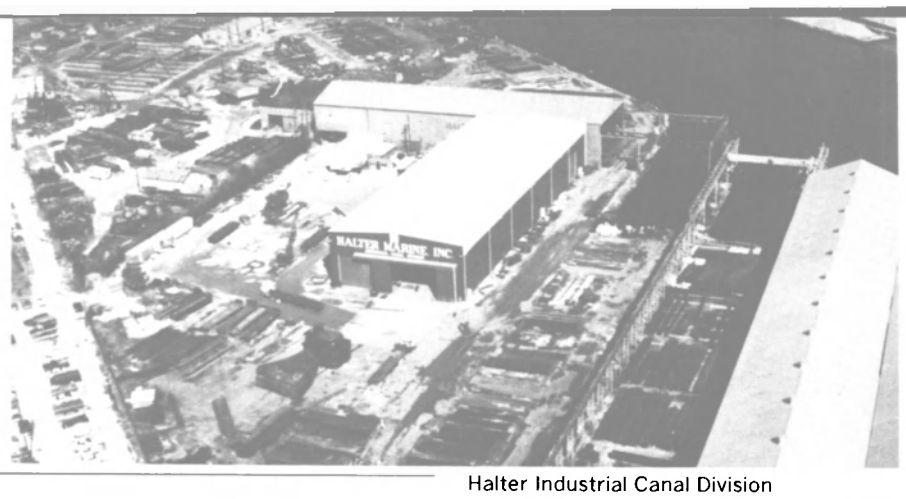
(Halter continued)

the end delivery of the vessel. Mr. **Edwards** commented that an in-house Engineering Department does not mean that the company has a not-invented-here attitude. Halter has an excellent history of building to other qualified designs.

Halter Marine is owned by Trinity Industries, a large well financed company with a wide range of products.

MOSS POINT

Halter Marine's Moss Point yard is located five miles above Pascagoula on the Escatawpa River. This yard has been owned by Halter Marine for over 20 years. To date 207 new vessels have been delivered from this facility. In a single contract of nineteen 200-foot vessels, the rate of delivery averaged 2½ weeks between completions and in some cases as many as two vessels were launched in a single week.



Halter Industrial Canal Division

Halter's Moss Point facility has cranes with capacities to 175 tons. Moss Point also has a complete pipe shop equipped with automatic pipe bending equipment that serves their needs, as well as all other Halter shipyards. A completely equipped machine shop can take care of all customers' needs on the spot.

Recently Moss Point delivered a 180-foot supply boat for State Boat that had sunk in the Gulf and was salvaged. This vessel was further damaged during salvage operations and had to be completely rebuilt.

CHICKASAW

Halter Marine's Chickasaw shipyard, located just north of Mobile Bay on the Chickasaw River, is Halter's largest shipyard. While the Chickasaw yard specializes in repair and conversion work, it has delivered many new construction vessels, such as the large Cat Tugs, supply boats and lift boats. Chickasaw has a drydock that has a lift capacity of 4,000-dwt that measures 160 feet long with 120-feet between wing walls. It is completely self-contained and is powered by two 450- kw generators. This yard has the capability of translating vessels from the water to the shore for major conversion or extended repair.

Halter recently signed a contract with Nicor for two 200-foot anchor-handling tug/supply boats. The contract required the vessels to be jumboized by the addition of a 16-foot midbody. Both vessels were moved from the drydock onto land where they were cut in half to receive the midbodies, releasing the drydock to serve additional customers. Halter Marine's Moss Point yard fabricated both midbodies for this job.

Halter's Chickasaw facility has two 300-ton cranes, one 100-ton plus others with smaller capacities. It has a complete fabrication shop, electric shop, machine shop and pipe shop. This facility also has more than 2,000 feet of wet dock space.

INDUSTRIAL CANAL

As further support of the Halter facilities the Halter Industrial Canal facility in New Orleans is equipped with Plazma Arch Numerically controlled burning machines that are capable of cutting all the steel and aluminum needs for Halter yards with precision quality.

CHALMETTE

The Halter Chalmette facility lo-

cated in Chalmette, La. specializes in the construction of both steel and aluminum high-speed craft such as crewboats, patrol vessels, pilot boats, ferries, mooring launches, yachts and survey launches. New construction takes place in a covered building in the facility. A 100-ton Travelift handles the translation of vessels throughout the yard plus launching and retrieval.

The Chalmette Yard also handles drydocking and repair.

The yard recently delivered three 101-foot crewboats to a customer in the Far East and is presently building a fourth 101-foot for the same client. A 65-foot utility boat was also recently delivered to the U.S. Navy. A 112 and 101-foot aluminum crewboat are presently under construction for stock.

LOCKPORT

The Halter Lockport facility was opened in 1966. Lockport specializes in the construction of supply vessels, tugs, river push boats and barges. The yard is also capable of handling repair work and shipboard modifications. A fully equipped machine shop supports all of the Halter facilities and customers with machine work and repair support.

The yard is presently building two innovative offshore tugs for a local client. The vessels incorporate a triple-screw arrangement comprised of one conventional propeller drive and two fully azimuthing propellers for maximum power and maneuverability. A number of offshore supply vessels are nearing completion at the Lockport facility.

For complete information and literature detailing Halter's services,

Circle 66 on Reader Service Card

INGALLS

Ingalls Shipbuilding division of Litton in Pascagoula, Miss., has been building Navy ships since 1938. The company's east bank facility produced troopships in World War II, as well as escort aircraft carriers, submarine tenders, and net layers. After the war Ingalls built amphibious assault ships, Forrest Sherman Class destroyers, and beginning in the late 1950s, nuclear-powered attack submarines.

In the late 1960s, Litton and the State of Mississippi joined forces to build an entirely new, modern shipyard—the only new shipyard that has been built in the U.S. since WWII. This 611-acre facility was built on a new concept pioneered by Ingalls in the 1970s, that of modular construction. This system has since been applied to the construction of Spruance Class destroyers, Tarawa Class amphibious assault ships, Kidd Class guided-missile destroyers, and is currently being applied to the construction of Ticonderoga Class Aegis guided-missile cruisers and Wasp (LHD-L), first in a new class of multipurpose amphibious assault ships.

Ingalls has also established a reputation in the surface ship overhaul business. Since 1982, the yard has overhauled six Spruance Class destroyers, work that normally requires nine months of intense effort, an average of 33 days ahead of schedule. Two additional Spruance overhauls will be completed this year.

Ingalls facilities have also proven adaptable to a variety of products and services requiring heavy manu-

(continued on page 86)

Right: Valley Forge (CG50)—Ingalls

Gulf Coast Yards

(Ingalls continued)

facturing, especially in the areas of building and repairing offshore drilling rigs and support structures. The company's design, engineering, and technical divisions offer a versatility of superior design services unmatched in a production facility. Ingalls has an ongoing capital investment and improvement program to continually upgrade its facilities to utilize the latest available technology.

The use of computer technology for ship design and production, especially computer-assisted design and manufacturing (CAD/CAM), has unlimited potential for improving shipyard productivity—from engineering to production shops to the building bays and outfitting docks. Ingalls installed its first CAD/CAM system in 1979, and is now increasing production significantly over manual drawing.

This equipment has three-dimensional capability, allowing engineers and draftsmen to detect system interferences on the drawing board, not on the ship where they are costly and time-consuming. Ingalls is also linking computer design with automated fabrication equipment already in place in steel, aluminum, pipe, and sheetmetal shops, further increasing productivity.

Circle 67 on Reader Service Card

KOCH-ELLIS

Further expansion for Koch-Ellis Barge and Ship Service has been completed. A family-owned marine company, Koch-Ellis has worked out of the New Orleans area for more than 50 years. Ship bunkering was its main concern until **Harriet Harrison** became president of the company in 1979. Since that time, Koch-Ellis has slowly but steadily increased its services.

Besides adding a new ship-bunkering office in Houston in 1981, the company's main direction in expansion has been to supply complete service facilities for both inland and oceangoing barges and ships. Koch-Ellis in 1982 acquired Barge and River Service, its neighbor on mile 104 of the Mississippi River, and has continually upgraded that facility since then.

The multi-function service area has a complete wet dock repair staff able to handle everything from electrical problems to above-water damage repairs. Koch-Ellis specializes in mid-period and alternate internal inspections.

There are two modern cleaning and gas-freeing plants, and a large inland barge steaming operation that can steam up to 14 barges at a time. Last year the company complemented this by adding a new liquid bulk carrier cleaning and gas-freeing facility.

Koch-Ellis is a pioneer in aerobic digesting systems for on-site treatment of wash water. It has worked closely with the Environmental Protection agency to help set industry waste disposal standards.

This year Koch-Ellis moved into new expanded offices at its Westwego, La., plant location. The company plans to continue its growth in order to handle the over-changing demands of the maritime industry.

Circle 68 on Reader Service Card

LEEVAC

Specialized vessel construction, predominantly conversion work, is the real area of activity for Gulf Coast shipbuilders, according to LEEVAC Shipyards of Jennings, La., a division of LEEVAC Corporation of Morgan City.

Shipyard sales manager **Charles Burrell** said, "we know the market in general is not great, but the level of conversion work we're involved with is consistently high."

LEEVAC, well known for its design and engineering expertise, is no newcomer to the specialty construction and conversion market. Customers such as Geophysical Services Inc., who have seen the yard's capabilities in specialized seismic construction of new vessels, return to them for conversion of supply boats or other vessels in their boat operator's fleet.

Geophysical's vessel Patrick E. Haggerty and the soon to be deliv-

Cal Div I—Leevac

ered Kenda are examples of LEEVAC's new construction for the seismic industry. Rare though it may be today, this new construction is happening because of rapid technical advances in the seismic industry, according to Mr. **Burrell.**

LEEVAC's conversion projects that have gained recent attention include the transformation of a basic 190-foot supply boat, the Cal Diver I, into a saturation diving vessel for Cal Dive International. Unique among vessels of its type operating in the Gulf of Mexico, this conversion involved the construction of a special moon pool located amidship through which the diving bell is lowered, and a new, totally enclosed operations system.

"Our research shows that the level of conversion will continue to increase because of new technology in the seismic and diving industries, and most importantly, the impending surge in the deep-water market," said Mr. **Burrell.**

Among projects currently under way at LEEVAC is the conversion of a 150-foot supply boat, the Seis Surveyor, to a seismic vessel for Survey Boats, Inc. of Paterson, La., a division of John E. Chance & Associates of Lafayette.

Circle 69 on Reader Service Card

MAIN IRON WORKS

Founded in 1948, Main Iron Works, Inc. (MIW) of Houma, La., now has facilities for construction of new vessels up to 250 feet in length. Drydocking and a full range of repair services are also available, including sandblasting, painting, and a complete machine shop facility.

With more than 30 years of experience in designing vessels for towing, shipdocking, and oilfield services, MIW is ready for the new challenges of the future. With more than 375 vessels delivered to date, many of them innovative and well ahead of their time, the yard recently delivered the Mabel Colle, one of the most modern shipdocking and general towing tugs on the Gulf Coast, to Colle Towing Company of Pascagoula, Miss. This 85-foot twin-screw vessel is powered by GM Electro-Motive Division EMD-12-645 diesels with a total output of 4,000 bhp, driving Ulstein H900 "Z" Drives with 72-inch bronze propellers in nozzles.

Circle 70 on Reader Service Card

Mabel Colle—Main Iron Works

MCDERMOTT

McDermott Shipyards, a division of the offshore construction giant McDermott Incorporated, has facilities at three locations on the Gulf of Mexico—Morgan City and New Iberia, La., and Gulfport, Miss. Each yard has under-roof construc-

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Gulf Coast Yards

(McDermott continued)
tion, automated drafting, NC burning, and modular construction as main components of its shipbuilding system. These yards are modern facilities capable of new construction, converting or upgrading existing vessels, and complete marine repairs.

Five drydocks are available, ranging in size from 1,500 to 5,000 tons capacity. The 5,000-ton dock, located at Morgan City along with a 3,300-ton unit, is 250 feet long with 110 feet between wingwalls. Two drydocks are located in New Iberia—a 3,300-ton facility 180 feet long and 80 feet between wingwalls, and a 1,500-ton dock measuring 160 by 65 feet.

McDermott's Gulfport yard was the latest to undergo expansion, from 10 to 84 acres, with more than five acres under-roof. Building ways are capable of launching vessels of up to 40,000 dwt. Output from this yard includes coastal and ocean-going petroleum, deck, and bulk cargo barges up to 600 feet long.

In addition to drydocking, all McDermott yards overhaul marine engines, repair and replace deck machinery, machine new tailshafts, build rudders, and crop and renew hull plating. McDermott is one of the few yards in the country aproved by the American Bureau of Shipping to repair shafts worn to under-minimum diameter.

McDermott recently delivered two unique, self-loading/unloading container barges to Matson Navigation Company of San Francisco. Named the Haleakala and Mauna Loa, the barges were towed in tandem to Honolulu where the container-handling cranes were installed. They are now operating in Matson's feeder service betwen Honolulu and other Hawaiian ports.

Circle 71 on Reader Service Card

MOSS POINT MARINE

Moss Point Marine, Inc. is currently building one 181-foot supply vessel, two 92-foot tugs, one 800-passenger paddlewheel/excursion boat, converting a 383-foot T-2 tanker to a hopper barge, refurbishing a 68-foot shrimp boat, and constructing twenty-six 110-foot lighter barges for the U. S. Navy. The first two Navy barges were delivered recently to California approximately three months ahead of schedule.

Founded in 1980, Moss Point Marine has already delivered 61 vessels, which strengthens its "New American Leader" slogan.

Moss Point recently delivered the 219-foot freezer/stern trawler, Amfish, reported to be the largest U. S.—built vessel of her type to fish off the U. S. East Coast. The Amfish contains approximately 38,000 cubic feet of refrigerated storage space and is capable of processing and freezing up to 40 tons of fish products per day

The shipyard had just acquired a 2,000-ton floating drydock which is 160 feet long and 60 feet between its 17-foot wingwalls. Constructed in 1980, the drydock has a built-in generation capacity capable of operating the dock in any location.

Moss Point Marine is located on the East Pascagoula River north of Pascagoula, Miss., which provides easy access to the Gulf of Mexico. The shipyard occupies a 30-acre site and has 900 feet of sheet pile bulkhead on the river. One hundred and fifty additional acres are available if further expansions is needed. The yard has the usual complement of shipyard crafts and skills but an unusually low employee turnover rate. Many of Moss Point's shipbuilders joined when the shipyard was formed and have made a commitment to remain there for a career. "That kind of dedication by highly skilled people is one of the principle reasons for our success," said **John Dane III.** president of the yard.

Moss Point Marine, Inc., is a complete shipyard with pipe, carpentry, and electrical shops, a large fabrication building, warehouse, three 150-ton crawler cranes, and various "cherry pickers" and other equipment. Specialized equipment is readily available from nearby specialists such as propeller and machine shops that are located within 10 minutes of the shipyard.

In addition to **John Dane III,** president, other principal owners and officers are **Burnice M. Havard,** vice-president, and **John Dane Jr.,** secretary-treasurer.

The yard's address is Box 1310, Escatawpa, Miss. 39552, and the telephone number is (601) 475-6885.

Circle 72 on Reader Service Card

NATIONAL MARINE SERVICE

National Marine Service Incorporated, headquartered in St. Louis, currently services the inland waterway system and the Gulf Coast with three full-service shipyards—at Harvey (New Orleans), La., and at Hartford and Grafton, Ill., on the Upper Mississippi River.

The Harvey yard, formerly Wall Shipyard, was acquired by NMS in 1980. Since then, improvements for the yard include: lengthening of the existing drydocks; construction of a new office building, engine shop, and wheel shop; purchase of a press brake; and increased inventory of diesel engine parts.

A new 160-foot drydock was installed soon after the Harvey yard was acquired, the sixth at the facility. Other work undertaken by National Marine included dredging of the bayou channel, rehabilitation

bulkheads, modification of two existing drydocks to handle larger barges and boats, and the improvement of gas-freezing facilities.

Circle 73 on Reader Service Card

NEWPARK

Newpark Shipbuilding & Repair, Inc., conveniently located on the Houston Ship Channel, combines experienced workmanship and knowledgeable management to provide quality work in the time frame required at a competitive price.

Inland and offshore vessels built at the Houston yard now travel the waterways from Alaska to the Amazon River, from the North sea to the Coast of Africa. New-construction capabilities include high-pressure cylindrical tank barges; customized vessels including shallow-water, self-propelled seismic craft; offshore, high-load deck barges; and inland, double-skin tank barges, to name a few.

Vessels can be lengthened, shortened, or have completely new prefabricated sections installed. Supply vessels have been converted to anchor-handling and seismic service. The company is founded on servicing the repair and maintenance needs of its customers, as well as overcoming specific design problems. Its resident naval architect has more than 40 years of experience.

Newpark's yard on the Houston Ship Channel

The Newpark yard covers about 25 acres, and includes the following facilities: 3,000-ton drydock, 220 feet long with 88 feet between wing walls; 1,500-ton drydock, 150 feet long and 76 feet wide; 1,250-ton drydock, 130 by 76 feet; two marine railways; a drydock/rail transfer system; 1,600 feet of water frontage; and 20,000 square feet of fabrication shops with automatic welding and burning equipment.

The yard offers all types of underwater repairs, from steel renewals to propeller reconditioning and ABS-approved tailshaft buildup. The electrical department has a staff of trained technicians specializing in marine electrical systems. Sandblasting and painting are specialties at Newpark; epoxy and inorganic coatings are routinely applied by experts. The yard's coatings work has been field-tested around the world.

Newpark's gas-freeing plant is one of the most modern facilities of its kind on the Gulf Coast, specializing in rapid turnaround. It has a smokeless flare for LPG gas-freeing for hot work, and nitro purging for certain types of external hot work repairs to vessels.

To insure timely performance, the shipyard works two shifts per day; services are available upon request 24 hours a day, seven days a week.

Circle 74 on Reader Service Card

ORANGE SHIPBUILDING

In the past few years, Orange

Gulf Coast Yards

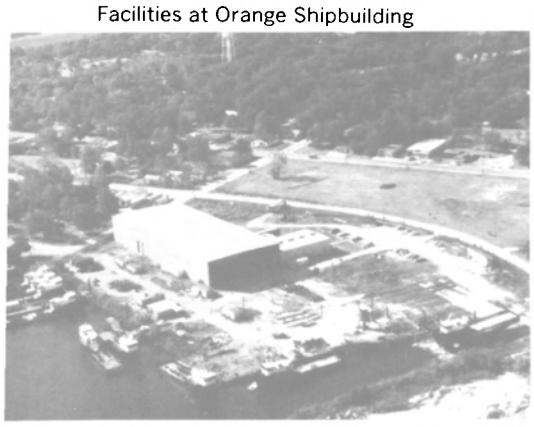
(Orange continued)

Shipbuilding Company, Inc. (OSC) in Orange, Texas, has added a 36,000-square-foot construction building having two bays each 300 feet long and 60 feet wide. Each bay is served by one 10-ton overhead bridge crane and one 30-ton crane. Productivity, efficiency, and quality control have increased substantially since the shop expansion.

In addition to the shop, OSC has added 10 marine transporters, each with a capacity of 400 tons, that are used to move completed vessels from the construction building to the water via the yard's marine transport system. This same system is used for drydocking vessels in need of repairs. As many as five vessels at a time can be docked using five side tracks. A vessel in need of major repairs can be moved inside the building, where work can proceed uninterrupted by weather.

OSC's marine railway is sized for 1,600 tons, and has a depth over the blocks of 16 feet. Future additions include a 7,500-ton-capacity drydock that is scheduled for installation in July this year, providing increased repair capacity.

Facilities at Orange Shipbuilding



Among recent deliveries was a 52½-foot pushboat for the Tennessee Valley Authority. This vessel, powered by twin Cummins diesels with a total output of 940 bhp, will be used to transport coal barges on the Green River in Kentucky.

OSC is currently completely renovating the 70-foot pushboat Habibi for Harless Towing Company of Lake Charles, La.; the vessel sank in the Lake Charles ship channel in January this year. Work includes installation of rebuilt diesel engines and generators, replacing electric pump motors, stripping and replacing all interior woodwork, installing new electronics and appliances, and repairing damaged steel. This vessel was moved into the construction building so that work could be performed quickly and efficiently.

Most other work at the Orange yard involves drydocking of boats and barges. Repairs have mostly involved sandblasting and painting, renewing bent propellers, propeller shafts, rudders, welding, and replacing damaged steel.

Circle 84 on Reader Service Card

PLATZER

Platzer Shipyard, Inc. in Houston has built and repaired marine equipment for more than 35 years. Located on Greens Bayou, its 20-acre yard offers marine repair, multiple-barge haulouts, boat drydocking, machining, gas-freeing, new construction, blasting and coating, and fleeting. In addition, a flare is being installed for flaring LPG pressure barges.

The yard's 130 employees have been kept busy recently on a variety of projects. The marine railway, with a 900-ton capacity, was rebuilt several years ago to allow for simultaneous docking of up to three barges through its transfer system. This permits working on large projects such as the recent replating of two 265-foot barges concurrently, while still being able to provide quick repair drydockings to other barges. With its 150-ton crane service, large sections can be prefabricated indoors, and fewer days are required on dock, as was the case in the recent replacement of the midsection of a hopper barge.

Platzer recently resumed drydocking and repairs to towboats. The yard has in-house capabilities for everything except propeller repairs. These capabilities include crane service, electrical repairs, carpentry work, machining, steel repairs, piping, and coatings. All service can be performed on an around-the-clock basis to minimize time out of service.

The machine shop was moved recently into a new 7,200-square-foot facility, with 10-ton crane service. Equipment is installed for any marine machining, including rebuilding of shafts to American Bureau of Shipping standards, up to 40 feet in length. Customers' shafts and rudders are stored under a bridge crane for ready access.

Platzer has long been active in the construction of tank barges and deck barges. Recently, the yard was awarded a contract for the construction of two specialized chemical barges. At this time, these may be the only tank barges under construction in the U.S. The facility is well-suited for construction of specialty vessels of any type. The shops are set up for modular construction in 35-ton units, with erection work kept to a minimum.

Efforts are being undertaken to make the yard ever more cost-effective through flexible manufacturing techniques aimed at the small quantities of varying types of vessels to be built over the coming years. With the yard's modern shops, machining capabilities, and in-house design expertise, any type of craft up to 900 displacement tons can be built.

Platzer's barge cleaning plant has capabilities for cleaning up to four barges at a time. The plant uses water, hot water, chemicals, and steam to perform cleaning operations at its two docks. Recently, back-up pump and vacuum equipment were added to provide better reliability.

Circle 75 on Reader Service Card

PORT ALLEN MARINE

The Midland/Port Allen Marine Service, Inc. (PAMS) main plant located on 750 acres with 7,500-foot frontage on the Gulf Intracoastal Waterway Canal, houses the main administration and engineering offices. Also at this site is the new construction facility with the capability of producing more than 200 barges per year utilizing the most modern numerically controlled cutting and welding equipment.

At this Louisiana location also is the Main Yard Repair Department featuring four drydocks ranging in size from 500 to 2,500 tons lifting capacity. Over the past five years, the Repair Department has drydocked and repaired an average of 765 vessels (boats and barges) per year, replacing some 320,500 pounds of steel annually. Supported by a fully equipped machine shop, electrical shop, and sandblast/paint facility, the Repair Department is able to have many projects under way at the same time.

PAMS' River Plant, located on the Mississippi River three miles south of Baton Rouge, houses a topside repair facility with more than 600 feet of repair dock space, as well as capability to perform mid-stream repairs to deep-draft oceangoing vessels, and a drydock for quick-turnaround bottom and side repairs.

At this location is PAMS' gas-freeing and cleaning facility, which is equipped to handle 100 barges per month, treating and disposing of all wastes, including halogenated organics and oil sludge, with strict adherence to all regulations established by the Louisiana Department of Natural Resources and the EPA.

PAMS recently completed the conversion of 80 open hopper barges to covered grain barges for The Ohio River Company, also a Midland Enterprises affiliate. This project involved the alteration of the coamings to receive covers and the building of 80 sets, or 880 corrugated metal lift-off covers with hinged loading doors in each cover. All covers were blasted and painted. The entire project was completed in about five months.

PAMS is currently converting a 160- by 38- by 10-foot deck barge into passenger dinner/cruise barge

for Gateway Clipper Fleet Inc. of Pittsburgh. The finished vessel, which will be 166 feet 8 inches long, with a beam of 48 feet and depth to main deck of 10 feet, will feature three covered decks for the seating of up to 1,000 dining passengers in air conditioned comfort. The dining barge will be propelled by a dedicated pushboat that will also contain the gallery and mechanical equipment required to service the passenger areas.

Included in PAMS' future work is a major renovation of the 290-foot passenger riverboat President. The upgrading will include extensive replacement of interior and exterior decks and bulkheads, as well as a complete blast and paint job.

PAMS is presently negotiating with Shell Oil of Houston for the construction of two LPG barges. Each will contain three tanks 172 feet 9 inches long with diameter of 14 feet 8 inches and a design pressure of 100 psig. Tentative construction schedule for this project is to start fabrication in mid-April, with delivery of the second barge by the end of October this year.

Circle 76 on Reader Service Card

SERVICE MACHINE

Service Machine and Shipbuilding Corporation was founded in 1956 when the offshore industry in the Gulf of Mexico was in its infancy. Over the years, the Service Machine Group (SMG), as the company is known today, grew in a progressive and well-timed manner, paralleling the offshore industry itself.

SMG today is a multi-faceted organization providing services in shipbuilding, barge building, drilling rig construction, drydocking, topside repair and renovation, complete electrical services, tubular manufacturing, and fabrication of major offshore facilities.

Strategically located near Morgan City, La., at Amelia, the Marine Service Division of SMG has facilities and equipment that include an area of 30 acres, 3,000 feet of water frontage, 25,000 square feet of covered work area, crawler cranes of up to 150-ton capacity, 10,000 square feet of warehousing, floating drydocks with up to 2,500-ton capacity, and steel bulkhead for efficient topside work.

The Marine Services Division is fully equipped, staffed, and experienced to build vessels such as inland and offshore tugs, towboats, utility boats, ferries, supply boats, tug/supply vessels, deck cargo barges, jackup drilling rigs, and drilling/workover barges.

This Bayou Boeuf facility is linked directly to the Gulf of Mexico without restriction via the Gulf Intracoastal Waterway, the Atchafalaya River, Bayous Boeuf and Black, and the Chene Navigational Channel that is 400 feet wide and 25 feet deep.

Electrical service is provided by Sermac Electrical Systems, an affiliated company with offices in Morgan City. Sermac provides design and installation of total electrical systems, generator control panels, and monitoring systems for both manned and unmanned engine rooms. Complete motor rewinding is also available for traction motors and welding machines.

Currently under construction at the SMG yard is the 145-foot supply boat Erika Lynn for G & B Marine Transportation of Golden Meadow, La. Delivery is scheduled for June this year.

Circle 77 on Reader Service Card

STEINER SHIPYARD

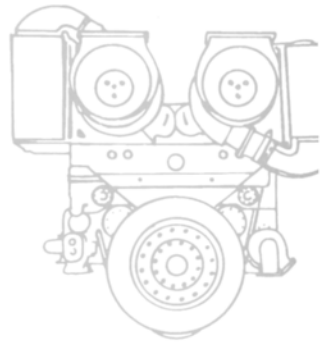
As of March 15 this year, Steiner Shipyard in Bayou La Batre, Ala., had 13 vessels under construction. Company president **Russell Steiner** says, "It is doubtful that we will build in 1985 the number of boats that we built in 1984, but it must be taken into consideration that 1984 was our biggest year in number of boats built. We built 38 boats in that one year!" The market continues to be strongest overseas, and only two of the boats presently under construction are for the American market.

Of the vessels now under construction, nine are 75-foot standard stock steel shrimp trawlers; one is an 80-foot trawler with the house forward and the steering section raised at the aft part of the house; and the others are an 86-foot fore-

(continued on page 94)

COME TO WHERE COLT-PIELSTICK*

* S.E.M.T.—Pielstick is a registered trademark of Societe d'Etudes de Machines Thermiques Paris, France.



Colt-Pielstick Diesels
Big horsepower in less space
Ratings to 29,700 bhp.

THE POWER IS

When it comes to dependable, economical marine POWER, you can't beat Colt-Pielstick diesel engines. The PC-4 Series is now available with a horsepower range to 29,700 bhp. PC-2 Series to 13,266 bhp. Their reliability has been proven in many millions of hours of operation with over 70% on heavy and residual fuels.

Colt-Pielstick engines are compact, too. Their power is packed into much less space than a 2-cycle engine and they weigh less. Initial costs are also less because Pielstick engines can be installed completely assembled resulting in a substantial savings in shipyard labor cost.

Fairbanks Morse has built the Pielstick PC-2 Series diesels in ratings to 13,266 bhp since 1970 and during that time has built engines for a wide range of commercial and naval applications including the current Navy LSD program. In addition to the Pielstick, the Fairbanks Morse O-P engine, with ratings of 700 to 4200 bhp, meets many Navy applications and has long played an important propulsion and ship service role in the fleet.

Get the complete Colt-Pielstick marine POWER story, today. Write or call Colt Industries, Fairbanks Morse Engine Division, Beloit, Wisconsin 53511. 608/364-4411.

Colt Industries

Circle 144 on Reader Service Card

Fairbanks Morse
Engine Division

Gulf Coast Yards

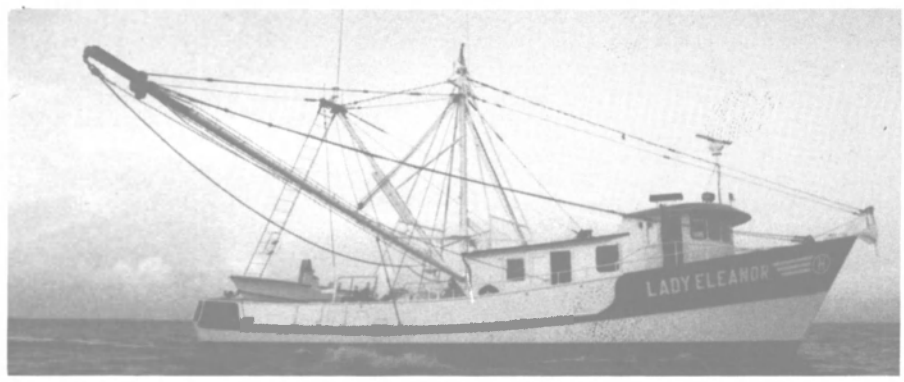
(Steiner continued)
castle boat and two 58-foot aluminum oyster boats.

The 75-foot steel shrimp trawler continues to be the boat most in demand at the Steiner yard. This boat has proved to be very versatile, and so much in demand that there have been no significant changes in its hull design since 1980. The 75-footer was designed especially for fleet operations, with complete interchangeability of parts, simplicity, durability, and low maintenance being among its features. These features, so vital to fleet owners, has also made this design very desirable for the single-boat owner.

The two aluminum oyster boats are being built for the Louisiana oyster industry. These are constructed in a more or less separate production line.

As for steel hulls, the Steiner yard makes effective use of its two ESAB Heath shape-cutting machines. Speed and uniformity of cut-out are afforded by this process, and there is much less chance of error. Not only has Steiner been able to supply its assembly lines with parts through the use of the Heath machines, but it is planned that the use of these machines will eventually be sold to other shipyards for the cut-out of their vessels.

At the beginning of 1985, Steiner converted its inventory, cost control, and other bookkeeping process to an all-new computer system. This IBM System 36 has the capacity for handling all the present demands of Steiner Shipyard as well as its inventory system. Additionally, the computer has capacity for anticipated growth for many years to come.



Lady Eleanor—Steiner Shipyard

Circle 78 on Reader Service Card

SWIFTSHIPS

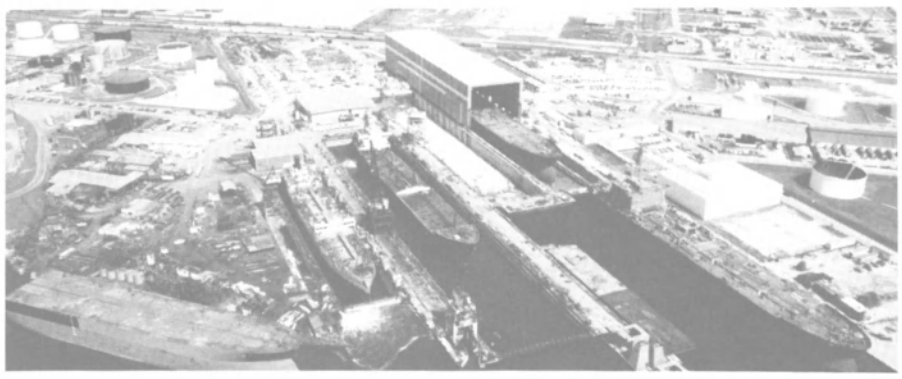
Swiftships, Inc. is a division of United Nuclear Corporation of Falls Church, Va. Swiftships, Inc. of Morgan City, La., was established in 1969; the current president, **Jerry Hoffpauir,** was one of the founders.

Swiftships is comprised of five divisions: the Morgan City yard specializes in aluminum construction of oilfield vessels, ferryboats, military craft, specialty vessels, and pleasure boats; Swiftships/Champion of Pass Christian, Miss., specializes in construction of larger steel vessels; Swiftships/Lafitte in Marrero, La., is a 24-hour repair facility and can accommodate vessels up to 125 feet; Swiftships/Freeport in Freeport, Texas, is a full-service repair yard specializing in supply vessels, large ocean-going barges, utility boats, tugs, and crewboats, and has two dry-docks of 2,500 tons and 3,500 tons; and Swiftships/Maroil in Singapore, which specializes in construction of military and oilfield support type vessels of steel and aluminum.

Circle 79 on Reader Service Card

TAMPA SHIPYARDS

A subsidiary of The American Ship Building Company, Tampa Shipyards Inc. is a full-service shipbuilding and repair facility. Located



Tampa Shipyards

on the newly deepened, 43-foot Sparkman Channel, the Tampa yard has recently become the largest shipyard in the State of Florida. With a production force of 1,500 employees, the yard is presently engaged in new construction as well as ship repair and conversion projects.

The newbuilding work is centered around the current $300-million, T-5 tanker program. Five 30,000-dwt product tankers are being constructed for Ocean Product Tankers, Inc. of Houston, for ultimate charter to the Military Sealift Command. These tankers, 615 feet long with a beam of 90 feet and 34-foot draft, are designed to meet special requirements of the U.S. Navy.

In order to compete in today's highly technical shipbuilding industry, Tampa Shipyards embarked on an innovative and aggresive expansion program. During 1984, major new facility installations were completed and integrated into the current ship construction program.

Recent additions include two graving docks 750 feet long, 125 feet wide, and 28 feet deep, and a new 90,000-square-foot erection facility. This assembly building is 600 feet long, 145 feet wide, and 115 feet high, and is serviced by two 250-ton overhead bridge cranes. Some 350 feet of this building straddles the new-construction drydock, allowing pre-assembled units weighing up to 500 tons to be erected in a totally enclosed environment.

In addition to these significant new erection facilities, Tampa Shipyards has acquired a long-term lease on the totally enclosed 430,000-square-foot Westinghouse heavy fabricating facility located near the main yard. In this facility, steel modules weighing between 200 and 500 tons are fabricated, prematched, completely pre-outfitted, and loaded on barges using the 700-ton overhead bridge crane that extends over the water for that purpose. The large units are then transported to the main yard where they are assembled into the massive stern structure located inside the erection/assembly building.

New full-service outfitting berths adjacent to the assembly building are equipped with gantry and tower cranes to facilitate outfitting and testing. Tampa Shipyards is also making substantial investments in other related areas, including upgrading and modernization of the steel fabricating, sheet metal, carpentry, machining, electrical, and pipe departments, as well as blasting and painting facilities.

With its convenient location and year-round favorable working conditions, Tampa Shipyards provides one of the most unique and modern shipbuilding and repair facilities in the U.S.

Circle 80 on Reader Service Card

TODD SHIPYARDS

Todd Shipyards Corporation's presence has been positively felt in the U.S. Gulf of Mexico region since 1922, when operations were commenced in Mobile, Ala., with a subsidiary company, Todd Shipbuilding & Dry Dock Company. In 1923 Todd purchased land in Algiers, La., across the Mississippi from New Orleans, and Todd Engineering, Dry Dock & Repair Company was formed in 1925. This facility ultimately became the New Orleans Division. Establishment of Todd Gal-

(continued on page 96)

Gulf Coast Yards

(Todd continued)

veston Dry Dock Inc. in 1934 and the Houston Shipbuilding Company in 1941 added to Todd's prominence in the Gulf area.

The Mobile yard was leased and later sold, leaving Todd with four locations in the Gulf area, although the Houston Division has been idle since 1983.

Below—Todd New Orleans

Located on Pelican Island, the Galveston Division is a fully integrated repair/conversion complex. The yard boasts two new steel floating drydocks. One is 853 feet long and 164 feet wide, with a lifting capacity of 40,000 long tons; the other measures 550 by 118 feet and can lift up to 18,000 long tons.

In December 1984, Todd Galveston was awarded a $30-million U.S. Navy contract for the modification of the first of two C5-S-78A Seabridge Class RO/RO-containerships into Aviation Logistic Support Ships (T-AVB). These ships have an overall length of 602 feet and beam of 90 feet.

A quarter-mile away the Galveston Division operates the Southwest Plant, occupying 22.4 acres and featuring a 250-foot slip with a 200-foot covered marine bay with a width of 85 feet and depth of 15 feet. This facility is ideal for launching and final assembly of vessel midbodies, barges, and offshore structure components. Two 200-ton-capacity bridge cranes and 118,855 square feet of covered manufacturing space within a 685-foot steel building make the Southwest Plant exceptionally suited for heavy structural steel fabrication.

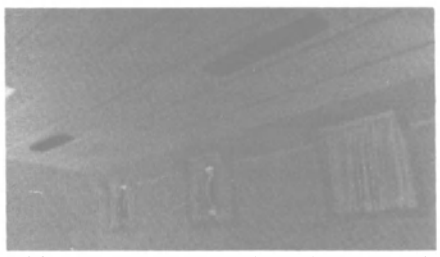
Todd Galveston

Todd's New Orleans Division is capable of repairing a wide variety of ships, including tankers, ferries, cargo vessels, and barges of every size. The yard has three floating drydocks. Two of these each have a lifting capacity of 15,000 long tons, measuring 579 by 84 feet and 614 by 86 feet. The smallest drydock, measuring 306 by 63 feet with a lifting capacity of 3,500 long tons, was built recently to service inland waterway vessels. A large new crane, reconstruction of a 525-foot wharf section, and construction of a new 440-foot wharf extension were also part of a recent improvement program at the New Orleans facility.

In addition to its Gulf operations, Todd Shipyards Corporation, headquartered in New York City, also has shipyard facilities on the West Coast in Seattle, San Pedro, and San Francisco.

Circle 81 on Reader Service Card

DAMPA Continuous Ceiling Approved By U.S. Navy—Free Brochure Available



DCC is generally used throughout vessels and offshore units where the ceiling design must comply with and meet the combined requirements of fire protection, sound regulation, aesthetics and simple installation.

DAMPA Marine has made available a free 20-page brochure on the DAMPA® Continuous Ceiling System (DDC) that the company manufactures. The U.S. Navy (NAVSEA)-approved DAMPA Continuous Ceiling is a lightweight galvanized steel and baked enameled with unperforated or perforated surface for increased sound absorption.

The publication, which is generously illustrated with photos, drawings and graphs, describes DCC as a steel ceiling system that can be mounted either before, during or after the installation of partitions. Fire resistant and sound absorbing, the lightweight steel construction combines rigidity and strength. The ceiling units are supplied pre-cut to fit each individual room requirement, thus reducing labor costs, installation time (approximately six minutes a square foot), and waste of materials; and a wide range of integrated components such as luminaires, loudspeakers and ventilation units are available. DCC is marketed through a worldwide network of subsidiaries and partners, and designers, shipowners and yards have specified and used it in more than 1,000 vessels.

In addition to being U.S. Navy (NAVSEA)-approved for future application onboard U.S. Navy and Military Sea Lift Command vessels (new and conversions), DCC fulfills "A" class divisions of A-0, A-15, A-30, and A-60 standards and "B" class divisions of B-0, B-15, and B-30, respectively, as defined by IMO International Conference on Safety of Life at Sea 1974 (SOLAS 1974).

For more information and a free copy of the DAMPA Marine brochure,

Circle 58 on Reader Service Card

Newman's Names Duncan VP-Sales And Marketing

Newman's Inc, Tulsa, Okla., has appointed **John G. Duncan** as vice president-sales and marketing, operating from the company's Houston division. He will be responsible for the marketing and sales functions of all six Newman's locations.

Before joining Newman's, Mr. **Duncan** served as vice president of sales and marketing for Bonney Forge, a division of Gulf and Western. He has had 22 years' experience in the pipe, valve and fitting field serving the chemical, petrochemical, refining and power industries.

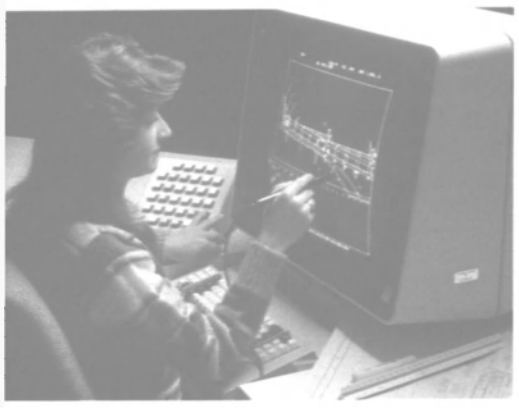
Norcontrol Revamps Its U.S. Operations —Hogan Named President Of Authorized Agent

The Norcontrol Division of A/S Kongsberg Vaapenfabrikk in Norway is restructuring its U.S. operations. Effective immediately, Nav-Control, Inc. of Halesite, N.Y., has been appointed authorized agent for its navigation/instrumentation line of products. Nav-Control will also administer certain projects and in-process contracts on behalf of Norcontrol, who will fully honor all such outstanding commitments.

Dennis Hogan, who was formerly Kongsberg North America's sales manager for Norcontrol products, has been named president of Nav-Control, Inc. His experience and capabilities will continue to be available to Norcontrol. This arrangement will enable the company to continue to serve the needs of its customers promptly and effectively, and will strengthen Norcontrol's activities in the U.S.

For full details and free literature on Nav-Control's product line,

Circle 36 on Reader Service Card



Scanner Gives Peterson Builders Edge In Navy Shipbuilding Project

Peterson Builders, Inc. (PBI), of Sturgeon Bay, Wis., had a tall order with a tight deadline: build a series of ships for the US Navy and provide the entire set of construction drawings in digital data form.

The problem was that the drawings had been created manually, and re-creating them in digital format would require thousands of hours of computer work by experienced CAD operators. More than 750 assembly drawing sheets would have to be converted to a CAD database in less than eight months. Using conventional digitizing approaches would impose a severe strain on PBI's CAD resources and staff.

Top left—**George O'Keefe** of Peterson Builders Inc., with one of the minesweepers Peterson builds for the U.S. Navy. Using the Skantek SK-1010 automatic digitizing scanner, Peterson Builders was able to significantly improve productivity in the digitization of naval drawings.

Bottom left—Once the drawings are scanned and digitized, they are edited on a CAD workstation.

George O'Keefe, PBI's CAD/CAM manager, went looking for an innovative solution to the drawing-conversion problem. He selected Skantek, Inc., of Warren, N.J.—a new firm looking to "beta test" its new product, the SK-1010 digitizing scanner. Skantek needed an initial test installation, outside its own facilities, for the new SK-1010.

Mr. **O'Keefe** approached his challenge pragmatically: he reasoned that manual drawings had been sufficient documentation in the past, and that similar-quality data in digital format would yield savings to organization, distribution and incorporation of changes into the drawings. Mr. **O'Keefe** set his data-conversion goal as the exact duplication of the existing drawings.

"What we wanted," Mr. O'Keefe said, "was a device that would give us an accurate, one-to-one representation within the CAD system of the original, hand-rendered drawing." He looked for some straight answers from the people at Skantek.

The SK-1010 system was explained. No commercially-available software technology can transform manually-prepared drawings into perfectly accurate computer files. But Mr. **O'Keefe** learned that the SK-1010 could help make the job of large-document conversion to his computer database easier, more productive and less costly.

As an experienced professional, Mr. **O'Keefe** recognized the scanner's value as a tool that could help PBI complete the Navy contract and make the drawing conversions without cost overruns or delays. PBI ordered that the scanner be delivered and, prior to its arrival, established a second shift for operation of the CAD system.

With a second shift, newly-hired CAD operators could begin the process immediately. Upon arrival of the SK-1010, the scanning began, and technicians could begin editing the scanned files without interfering

with PBI's regular CAD activities.

Installation of the SK-1010 scanner went smoothly. "It was the easiest installation of CAD equipment I've been involved with," said Mr. **O'Keefe**. And the SK-1010 proved to be easy enough to operate that most of the drawings could be scanned by first-shift clerical workers. "In two hours it was up and running, and within three hours, we'd trained some operators. We were scanning drawings that same evening," added Mr. **O'Keefe**.

After scanning a drawing, the optically-read data is converted from raster to vector format, written to tape, and readied for transfer to the CAD system. Once the converted drawing is loaded onto the CAD system, it goes through an editing process. The number of steps necessary to complete this process vary, depending on the quality and density of the original drawing.

Working closely with the Skantek team, Peterson Builders has developed its own techniques and procedures to fully utilize the converted data on their own CAD system. By using the scanned data as a template, PBI's CAD operators are readily able to separate acceptable data from those data that require further attention. Mr. **O'Keefe** says that, even in cases where the density and quality of scanned drawings requires extensive editing, the SK-1010 scanning process continues to be cost-effective. Once a drawing is fed into the scanner, the scanning requires little active supervision, thus further reducing personnel costs.

Having proven to Peterson Builder's satisfaction that the SK-1010 is capable of helping convert large engineering drawings to CAD files, Mr. **O'Keefe** is now seeking more applications for the scanner. One potential application he already has identified is the capture of design sketches and graphics for technical reports.

For Skantek's part, the PBI project provided the challenge it was looking for, to test the SK-1010's capabilities. The typical PBI design drawing is 30 inches wide, 12 feet long, averages three sheets per drawing and is comprised of many densely packed lines and symbols. Once scanned, each drawing at first required 10 to 20 hours of editing on the CAD system. This was quickly reduced to an average of two to three hours per drawing sheet on all drawings, including A-, B-, C-, and D-size and roll-type documents. Before the SK-1010 scanner was introduced into the process, re-creation time for each roll drawing averaged 44 hours.

For PBI, the SK-1010 is just what the Navy ordered. Peterson Builders has found that the Skantek device gives it a technological edge, helping PBI to meet the Navy's requirements without having to expand its CAD staff.

For free literature on the SK-1010 digitizing sanner,

Circle 3 on Reader Service Card

Saab Introduces New Level-Gauging System —Literature Available

Saab Marine Electronics has developed a new version of its radar-based level-gauging system for tankers. The system is called Saab TankRadar, Model M, and incorporates all the reliable components of the original SUM-21, but with added capabilities to supply temperature and inert gas pressure measurements. The same three-pair deck cable is used for both level, temperature, and pressure transmission, which means that substantial savings on installation costs can be made. In addition, the equipment cost is about 15 percent lower than the company's previous radar-based gauging system.

Also possible to incorporate in the TankRadar system are features such as color graphic CRTs, electronic remote control of pumps and valves, wireless portable deck readouts, and volumetric data.

One of the first installations of the new system will be aboard Exxon's two 209,000-dwt crude oil tankers to be built by National Steel and Shipbuilding in San Diego.

For further information and free literature on the TankRadar system,

Circle 51 on Reader Service Card

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Circle 334 on Reader Service Card

Daewoo Names New Shipbuilding President

Woo-Choong Kim, chairman of the Daewoo Group, recently announced the appointment of **Young-Suk Yoon** as president of Daewoo Shipbuilding and Heavy Machinery Ltd., a Daewoo Group member company.

Mr. **Yoon** succeeds **In-Kie Hong,** who has been appointed president of Daewoo's planning and coordination division. Mr. **Yoon** was previously president of Daewoo Heavy Industries Ltd.

Mr. **Kim** also announced four additional appointments:

Soung-Bu Hong, who was president of the planning and coordination division, has been named president of Daewoo Corporation and is responsible for construction; **Kyung-Hoon Lee** is now president of Daewoo Heavy Industries. He had been president in charge of Daewoo Corporation's trading activities; **Kyung-Shick Lee,** a former vice minister of communications of the Republic of Korea, has joined the group as president of Daewoo Telecom Co., Ltd.; and **Suk-Ki Rhee** has had the coordination of Daewoo's construction activities added to his responsibilities as the group's vice chairman.

Saab Purchases Salwico

The Saab-Scania Combitech, a major group of the Swedish company Saab-Scania A/B, has purchased the operations of Salwico, Inc. located in Hoboken, N.J. Saab will continue the same operations and services as formerly offered by Salwico.

The newly formed division will be known as Saab Tank Control. In addition to the marketing of Saab's microwave level gauging equipment, Saab Tank Control will continue with all marketing and services for the well known Gunclean fixed tank washing equipment; Howden's inert gas equipment; oil pollution monitors of Salwico and high level alarms and tank temperature gauging of Ian-Conrad Bergan Inc. and other marine products.

In addition the new company will manage the marketing of the Saab level gauging and inventory control systems for the industrial and tank farm industry and manage the service centers in the U.S.

James F. Rolfe, president of Salwico has been appointed president of Saab Tank Control and will continue to be located in the Hoboken office.

For further information about the new Saab Tank Control Division,

Circle 52 on Reader Service Card

Perry Offshore Announces Expansion Through Tritech International Network

Robertson A/S Radio-Elektro of Egersund, Norway, has been acquired by Tritech International, the joint venture company of Perry Offshore, headquartered in Riviera Beach, Fla., and Bird Technology A/S of Bergen, Norway.

Robertson, to be renamed Robertson Tritech A/S, is a leading producer of marine autopilots and gyroscopes for commercial and pleasure boating markets.

Located on the southwest coast of Norway and employing some 150 people, Robertson Tritech will expand its line of marine navigation and electronic instruments and start building ROVs (undersea robotic work systems) developed by Perry Offshore and the Bird Group.

Perry and Bird formed Tritech International early in 1984 to develop new technology, manufacturing expertise and service capabilities for subsea work systems and high technology products and services for offshore markets. Robertson Tritech is the newest addition to the Tritech International network that includes technical manufacturing and service capabilities in the U.K., Norway and the U.S.

Robertson Tritech will become the manufacturing base for the new small, low-cost SPRINT 101 ROV system. They are also planning to start manufacturing the larger TRITON 202 ROV systems in 1986. Perry Offshore has started production of the first TRITON systems at its Florida manufacturing facility.

TeleSystems Introduces Advanced Transportable Satellite Earth Station

COMSAT TeleSystems, Inc. recently announced the introduction of one of the world's most advanced transportable satellite earth stations. Small and rugged enough to be carried as luggage, the TCS-9000 Satellite Earth Station is a fully capable satellite terminal specifically designed for mobile users such as mineral exploration teams, tactical units, and emergency response teams.

Through the INMARSAT network of communications satellites, the TCS-9000 provides long-distance telephone service, telex, and data communications from anywhere in the world. The entire system weighs just 70 pounds, is packaged in two weathertight aluminum carrying cases, uses only 385 watts of power, and can be carried to any site. Designed to save transport space, it is also tough enough to be air-dropped. One person can unpack the TCS-9000 and have it ready to transmit and receive within 15 minutes. The collapsible antenna assembles easily and is manually aimed at the satellite. Plug-in connections for peripheral equipment complete the set-up process. Once assembled, the system's software-driven console guides the user through menus of options, making for easy operation without the need for reference to complicated manuals.

Based on the TeleSystems MCS-9100 ship earth station—proven at sea and in Military Standard 167 endurance testing—the TCS-9000 is built to take the punishment of constant travel: shock, vibration, and extremes of weather. Built-in fault isolation circuits and modular design make failed components easy to locate and replace.

The TCS-9000 is designed for adaptation and growth. Major equipment changes require only the addition of small memory chips. Among the custom options offered by TeleSystems are remote control and remote access equipment, a 30-minute emergency battery pack, a converter for DC power, a PABX interface, a 56-kilobit-per-second high-speed data modulator, a telephone expansion unit for up to two remote telephones, an automatic voice call initiation unit, personal computers, and an additional teleprinter interface.

Located in Fairfax, Va., TeleSystems is part of the equipment manufacturing arm of the Communications Satellite Corporation (COMSAT).

For further information on the TCS-9000 Satellite Earth Station from TeleSystems,

Circle 16 on Reader Service Card

Sonatech Announces New Expendable Doppler Soil Penetrometer

Sonatech, Inc. of Goleta, Calif., recently introduced the Sonatech Expendable Doppler Penetrometer (EDP) system, designed to determine the undrained shear strength of ocean floor soils by measuring instantaneous velocity of a sound source probe as it falls through the water column and penetrates the sea floor. The system utilizes the Doppler principle of a sound source (probe) moving in relationship to a receiver in order to obtain the velocity measurement; the Doppler shift of the probe frequency is a direct function of probe velocity. The time-velocity microstructure produced by this measurement enables an estimate of the undrained shear strength profile and penetrability of sea floor soils.

The Doppler Penetrometer System finds application in Ocean Mooring studies and waste disposal site analysis where its 6,000-meter range allows operation to full ocean depths. Further, its in situ measurements provide higher accuracy than sample collection/analysis systems.

For complete details on the Sonatech Expendable Doppler Penetrometer system,

Circle 45 on Reader Service Card

Membrane Air Separation System From Dow Produces Gaseous Nitrogen On-Site, Economically

The Dow Chemical Company has announced a modular air separation system based on its advanced membrane technology. The new GENERON® systems produce 95-99 percent nitrogen and, according to Dow, are simple and safe to operate. As a consistent source of enriched nitrogen, the systems are expected to fill a broad range of industrial and commercial applications. This type of nitrogen is used extensively in the chemical process industry (CPI), metal producing and metalworking industries, and food processing. On-site production of gaseous nitrogen via the GENERON system can yield significant cost savings compared with alternative sources of nitrogen.

Compared with previous methods of on-site nitrogen generation, the GENERON air separation system is a compact, self-standing unit that can operate unattended. With no moving parts, it is basically simple to maintain. The system requires no flame source, and its nitrogen product contains fewer contaminants than nitrogen generated via conventional inert gas generators (IGG). The system also produces an oxygen-enriched stream that is properly vented or may be used for a variety of in-plant purposes.

System capacities typically range from 300 to 15,000 SCFH (standard cubic feet per hour). As a modular unit, it is a simple matter to tailor a system to current and changing needs. The entire system, including basic instrumentation, is skid-mounted and is easily positioned with a forklift. The skid-mounting also facilitates relocation of the system if process needs or plant layouts change. The compact design permits a system to be installed within tightly confined spaces.

In the GENERON system, the separation of nitrogen and oxygen constituents of air depends on their relative permeability through hollow fiber membranes. Each module contains millions of these membranes within a pressure case.

Gases such as oxygen exhibit a high permeability compared to nitrogen and pass readily through the membrane. Nitrogen, on the other hand, has an appreciably lower permeability rate and so a significantly smaller proportion is able to permeate the membrane. In effect, a large portion of the nitrogen is swept past the hollow fiber membrane, while all but a small percentage of the oxygen passes through.

Plant air, typically at 75-90 psi, provides the required driving force for the separation process. The pressurized air can be supplied from an existing plant air system or from a built-in auxiliary air compressor. The compressed air enters the module through a perforated tube running lengthwise down its center. The feed tube distributes the compressed air uniformly to the fiber bundle.

Thus, the incoming air stream is separated into an oxygen-enriched "permeate" stream and a nitrogen-enriched "non-permeate" stream. Water vapor also permeates the membrane rapidly, thus producing a dry nitrogen-enriched product stream. This stream exits the unit via a connection on the side of the module. The oxygen-enriched stream exits through the end caps to connections on each end of the module.

The GENERON air separation system consists of a number of membrane modules, connected in parallel. Installation of a unit requires only piping for compressed air feed and for outing the nitrogen to its end-use destination.

In addition to the membrane modules, a GENERON system includes an oxygen analyzer, appropriate flow meters and pressure gauges as well as a coalescing filter for removing oil droplets from the compressed air feed. No desiccant dryer is needed.

The GENERON air separation system provides a high degree of operating flexibility. If required, the system can be operated either on a continuous basis or intermittently.

For complete details on the GENERON air separation system from Dow Chemical,

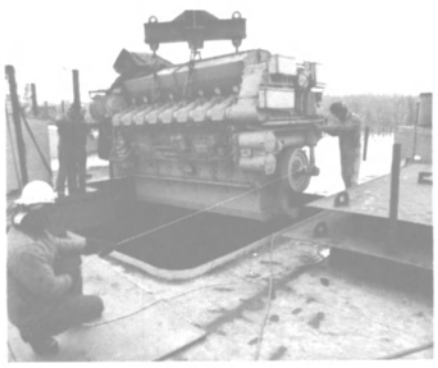
Circle 24 on Reader Service Card

Work On Hopper Dredge 'Ouachita' For Gulf Coast Trailing Co. Is On Schedule At Twin City —Launching Set For End Of May

Work on the construction of the 4,000-cubic-yard hopper dredge Ouachita, being built for Gulf Coast Trailing Company of New Orleans, La., continues to progress on schedule at Twin City Shipyard (TCS) in St. Paul, Minn. All steel work is 95 percent complete, and all major machinery—pumps, generators, etc., including two Deutz KHD engines (4,000 hp each at 1,000 rpm)—has now been placed in the vessel. Launching is set for the end of May,

The pilothouse, shown above, just after being lifted in place on the Ouachita.

One of the vessel's two 4,000-hp Deutz Diesel engines being lowered into the vessel.



and delivery is scheduled for the fourth quarter of '85.

The 8,000-bhp Ouachita was designed and is being constructed by Twin City Shipyard using the latest modular and zone construction methods. TCS is using state-of-the-art, computer-aided drafting and steel fabrication programs. Modules weighing up to 125 tons are fabricated and assembled in the yard's large erection hall, moved out by hydraulic walkers, and lifted into place using a heavy-lift Ring Horse crane.

Twin City Shipyard has become one of the leading U.S. yards in the design and construction of hopper dredges and dump scows, in addition to its standard line of hopper barges, deck barges, and Porta-barges™.

For more information about Deutz Diesel engines,

Circle 55 on Reader Service Card

For more information on Twin City Shipyard,

Circle 56 on Reader Service Card

New Worldwide Directory Available From Manville

Manville, Denver, Co., now has available their 1985 Worldwide Directory of Manville Products and Operations. This easy-to-use reference includes information on all Manville products, services, trade names, regional sales and customer service offices, producing locations, and a worldwide index of marketing and manufacturing operations.

Manville's extensive line of products and services has been organized into 24 categories, including a section on International and Export Marketing and Sales. A toll-free number is listed to obtain local sales office locations and the number for Manville's Product Information Center.

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With operations worldwide, Manville is a diversified manufacturing and natural resources company with primary businesses in insulation, forest products, roofing and mining.

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Setenave Shipyard Named Exclusive Representative For Portugese Yard

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For further information,

Circle 40 on Reader Service Card

SKF Steel Promotes Joann LaMere

G. Robin King, U.S. sales manager, recently announced the promotion of **Joann LaMere** to sales administrator of the Coupling Division of SKF Steel, Inc.

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The Coupling Division of SKF Steel manufactures OK Couplings and the Supergrip Bolt System for a variety of applications in the marine, mining/excavating, hydroelectric, wind-power turbine and construction industries.

For further information on SKF's products,

Circle 22 on Reader Service Card

Membrane Air Separation System From Dow Produces Gaseous Nitrogen On-Site, Economically

The Dow Chemical Company has announced a modular air separation system based on its advanced membrane technology. The new GENERON® systems produce 95-99 percent nitrogen and, according to Dow, are simple and safe to operate. As a consistent source of enriched nitrogen, the systems are expected to fill a broad range of industrial and commercial applications. This type of nitrogen is used extensively in the chemical process industry (CPI), metal producing and metalworking industries, and food processing. On-site production of gaseous nitrogen via the GENERON system can yield significant cost savings compared with alternative sources of nitrogen.

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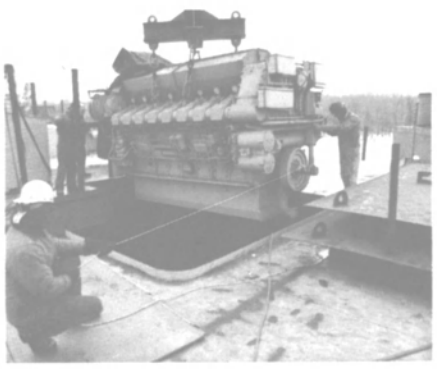

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Carter Appointed Vice President-Marketing For Henschel Corporation

George U. Curry, president of Henschel Corporation of Newburyport, Mass., a unit of General Signal, has announced the promotion of **John R. Carter** to vice president-marketing.

Mr. **Carter** has held a succession of engineering positions at Henschel since 1960, most recently as vice president-advanced programs. He has an electrical engineering degree from Lowell Technological Institute, and is a member of The American Soceity of Naval Engineers, The Society of Naval Architects and Marine Engineers, and the Institute of Electrical and Electronic Engineers.

Other appointments announced by Mr. **Curry** include **John G. Landers** as vice president-sales, and **John C. McPhee** as manager-contract administration.

Henschel is a leader in the design, development, and manufacture of ship control and interior communications equipment and systems.

Strickland Promoted To VP And General Manager At Matson Agencies

Matson Agencies, San Francisco, Calif., has promoted **Michael E. Strickland** to vice president and general manager in southern California, it was announced recently by **E.R. Swanson**, president.

Mr. **Strickland** was formerly assistant vice president. He joined Matson in 1977.

Matson Agencies serves as general agent for NYK Line in the western United States, Hawaii and Alaska and other carriers.

KTA-Tator Introduces Cross-Cut Guide —Literature Available

KTA-Tator Inc., Pittsburgh, Pa. has introduced their new Cross-Cut Guide.

A precision instrument that measures adhesion by the tape test with 11 parallel slots provides an easy, precise and repeatable method of making incisions into the coatings. Adhesion evaluations in accordance with ASTM D-3359 "Standard Method for Measuring Adhesion By Tape Test" can be performed in the field or lab. Slots can be spaced 2, 3, 4 and 5 mm apart. The guide is available separately or as part of an adhesion testing kit which includes a knife, replacement blades, roll of the specified ASTM tape and a copy of the test method.

For further information on the KTA Cross-Cut Guide,

Circle 88 on Reader Service Card

Larsson Appointed New Chief Executive of MacGregor-Navire

Lars G. Larsson, presently managing director of Consafe AB of Gothenburg, has been named chief executive of MacGregor-Navire International effective June 15 this year. He will bring with him a lifetime of experience in the marine industries, both afloat and ashore.

Beginning his seagoing career in 1960 with the Brostrum Group, Mr. **Larsson** took his master's certificate in 1966 and thereafter served as chief officer on various vessels, including the passenger liner Kungsholm. From 1969 to 1972 he held a shore-based position with Brostroms that involved cargo traffic. In 1973 he accepted an appointment with Transatlantic AB, which among other things involved organizing the company's West African liner traffic.

In 1977 he joined Leif Hoegh, Oslo, as operations manager of Hoegh Lines. Two years later he was appointed director of Consafe (Offshore), a subsidiary of Consafe AB, becoming managing director of the parent company in 1983.

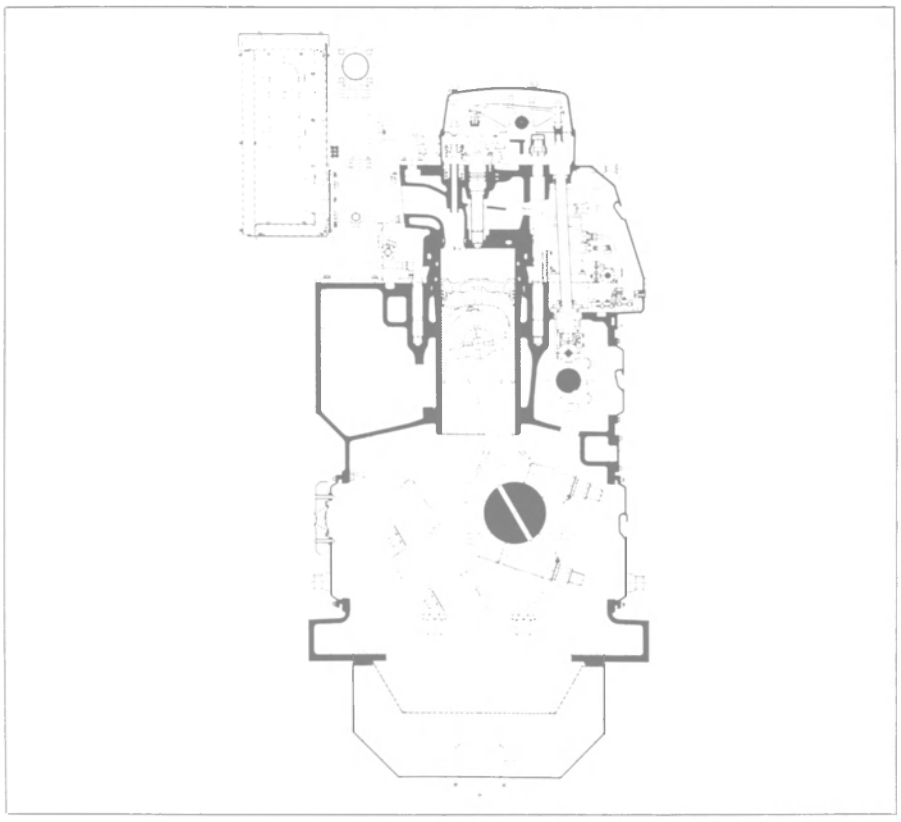
While **Johan Horelli** will relinquish the title of chief executive of MacGregor-Navire on June 15, he will continue as chairman.

PROPULSION UPDATE

BMV Maskin A.S. Introduces New Engine

BMV Maskin A.S. has introduced a new heavy fuel burning diesel engine for marine propulsion and auxiliary use as well as for shore side power generation. This new engine, designated the B type, has been undergoing intensive testing at the Bergen Diesel factory since September 1984. The engine has met all design and operational expectations.

Development of the B type engine was a result of an extensive market research program undertaken by BMV Maskin which clearly indicated the need for a modern medium-speed engine with an output of approximately 500 hp per cylinder. The B type engine is intended to augment the company's product line by offering an engine with twice the per cylinder output of its K type, the company's most popular production engine. The market research further identified the need for the new engine to use fuels which could be expected to be available to the marine market in the foreseeable future. As a result of the research it was decided to base the engine design on fuels with a viscosity of 700 cSt/50°C and a specific weight of 1.010 g/ml assuming the fuel treatment system is compatible. The company was able to use the experience it had gained during its 20 years delivering the heavy fuel burning K type engine. Corporate



design criteria gave low operating costs higher priority than lowest possible initial costs. The governing design criteria included:

— high reliability and long overhaul intervals on lower quality heavy fuels
— low fuel consumption
— low wear rates
— good component access and easy servicing of components

The B type engine design achieved the stated criteria. As a result of experience to date high reliability and long overhaul intervals are expected. Piston overhaul periods of 20,000 hours and exhaust value overhauls of up to 10,000 hours are expected on the lower quality heavy fuels. With further refinement and optimization of the fuel injection system, combustion chamber shape, and valve timing, the specific fuel consumption is expected to be reduced to 185g/kwh (136g/mph) under ISO-conditions with engine-driven lubricating and cooling water pumps. Low wear is achieved through sound design of pistons, piston rings and cylinders and the close attention to critical component surface temperatures. Great emphasis was placed on component access and serviceability of the B type engine as exemplified by:

— large crankcase covers for easy access to the running gear, bearings, etc.
— large camshaft—compartment covers for good access to camshaft, bearings, and value and fuel pumps actuating mechanisms.
— the camshaft is divided into sections which can be removed sideways and the cams can be exchanged when required
— large fuel pumps compartment covers for exceptionally good access to the fuel pumps, their regulating mechanism and to fuel oil and lubricating oil pipes
— slanted flanges for cylinder head exhaust and inlet ducts, with good access to all bolt connections and fittings, ensures easy fitting/removal of the cylinder head
— hydraulically tightened bolts extensively used

The B type engines are conservatively designed 4-stroke cycle diesel engines fitted with turbocharges and intercoolers. Principal engine technical data are: bore—320 mm; stroke 360 mm; engine speed—720/750 rpm; brake mean effective pressure—18-20.3 bar; maximum continuous rating—312-360 kw/cyl., 425-500 hp/cyl.; no. of cylinders—6-8-9 (in-line), 12-16-18 (V-types); output range—1,870-6,625 kw, 2,550-9,000 hp; maximum firing pressure—150 bar.

Individual components were designed and are built for extended engine longevity and serviceability. Noteworthy design and construction features of specific engine components and systems are summarized in the following paragraphs.

Cylinder Block: The cylinder block is made of modular cast iron incorporating a one-piece design with an underslung crankshaft. Lubricating oil and cooling water passages as well as the charge air receiver are integral elements of the cylinder block casting.

Crankshaft: Heavily dimensioned pins, journals and webs are used in order to create a very stiff shaft with moderate average bearing loads. Counterweights are fitted to every crankweb to balance the rotating inertia forces, thereby reducing the main bearing loads and contributing to the smooth running of the engine.

Bearings: Main and crankpin bearings are of the precision trimetal type (thin-wall steel shell lined with a copper/lead intermediate layer and a tin/lead outer overlay). The main bearings utilize the modern design practice of not using an oil groove in the bottom half in order to improve load-carrying capacity.

Connecting Rods: The fully forged connecting rods are machined "all over" and have an obliquely split foot with serrated mating surfaces. Comprehensive finite element analyses as well as many years of good experience with similar design K type engine connecting rods were the basis for the B type engine connecting rod design.

Pistons: The pistons utilize a composite built-up design. Piston

(continued on page 108)

BMV Maskin—New Engine

(continued)

cooling is accomplished by oil flowing up through the drilled connecting rod. The cooling oil flow rate is set to ensure adequate cooling at full load and yet prevent excessively low metal temperatures at low loads and the resulting low temperature corrosion. Three compression rings, each with its own carefully selected geometry, and one spring loaded oil control ring are used.

Cylinder Liners: Cylinder liners are centrifugally cast and the running surfaces are both nitrided to improve wear resistance. Bore cooling is used to ensure that the upper part of the liner metal temperatures and thermal stresses are properly controlled. Extensive finite element analysis was undertaken during design to arrive at the appropriate bore configuration.

Cylinder Heads: The four-valve cylinder head utilizes shrunk-in, replaceable valve seats. Exhaust valve seats are stellite armored and water cooled. By using multi-material exhaust valves—Nimonic valve head material with welded Deloro Alloy 60 seat facing and chomium plated conventional valve steel spindle—heavy fuel associated exhaust valve problems are eliminated, thereby precluding the need for exhaust valve cages. Consequently the exhaust valve ducts are designed for minimum losses and maximum gas throughputs.

Turbochargers: The latest generation turbochargers such as VTR series 4 from BBC are used in conjunction with a turbocharging systems based on the impulse principle. Bergen Diesel has chosen the impulse principle turbocharging system because of its ability to cope with shock loading and its ability to give greater air flow rates at part load than constant pressure systems. For the 8- and 16-cylinder engines, pulse converters are also employed.

Fuel Injection System: Satisfactory combustion of poor heavy fuels and the desire for low fuel consumption requires high injection pressures and short injection periods. To accomplish this very high pressure monoelement fuel pumps with constant pressure unloading valves are used. The pumps being used are operating with upper pressure limits of 1,400 bar. Special precautions are taken to prevent fuel leakage from the fuel pumps and high pressure piping from contaminating the lubricating oil.

For additional detailed information on the new BMV-Maskin engine, including test results and specifications,

Circle 2 on Reader Service Card

Racal Marine Opens New Northeast Sales Office

Eric Tyler, president of Racal Marine Inc., recently announced the opening of a new sales office to serve New York City and the Northeast Region of the United States.

The office is located at #7 Glenwood Avenue, East Orange, New Jersey 07017. Telephone is (201) 678-4041.

The opening of this new office is part of the planned expansion of Racal Marine Inc. in the U.S. Racal Marine Inc. also maintains sales offices in Palm Coast, Florida, New Orleans, Louisiana and Seattle, Washington.

Northeast regional product service support will continue to operate in Cranford, N.J., and calls for marine service should be made to (201) 272-4222 or (800) 874-4800.

New Waterways Rope By Columbian Rope —Literature Available

A new line of towing and locking lines, identified as P/D 84 has been introduced by Columbian Rope, Guntown, Miss. Designed for the inland waterways system as a companion rope to Columbian's P/D 101 river rope, P/D 84 has the family characteristics to perform services similar to P/D 101 in applications where less demanding rope performance is required, at a slightly lower workload level.

P/D 84 meets the requirements for waterways usage. Its superior construction is reflected in its greater breaking length when compared to competitive brands. It is flexible, easy to use and features low stretch. It renders safely with low surface friction, offers excellent control in checking yet is lightweight and easy to handle.

Its outer surface is formed of a blend of polyester, polyethylene and polypropylene to provide strong abrasion resistance. It has a melting point of 330 to 482 degrees. It is available in 600-foot lengths in either 1¾ or 2-inch diameters and is offered in white with a red, white and blue surface marker yarn in one strand and a twisted paper marker inside the same strand.

For further information on Columbian's new P/D 84 rope,

Circle 48 on Reader Service Card

New Monitoring/Alarm System By Siemens AG —Literature Available

Siemens AG of Germany has introduced a new generation of SIMOS 41 programmable microprocessor-controlled monitoring system with multicomputer capability for large oceangoing ships. Compared to conventional systems, it permits considerably expanded functions to be realized and a comprehensive periphery to be controlled.

The SIMOS 41 system permits analog and binary signals to be monitored for off-limit values and status change. Color video terminals display individual measuring points and an alarm text to indicate alarm. Group alarms may also be given audibly in up to four selectable stages. The alarm recorder registers all alarms, operating signals and commands.

The external alarm system can transmit a maximum of 32 visual group alarms to watch terminals on the bridge and in the accommodation area. All off-limit values can be indicated on color video terminals by a choice of either figures or with color change. Trend monitoring incorporating a graphic display is designed for 16 freely definable analog measuring points. The alarm recorder offers a choice of registering all measured values either in lines or in columns. The monitoring system permits multi-terminal operation with up to eight independently operating color video terminals.

In combination with the SIGOS 41 Graphic and Operating System, it is possible to show colored process graphs with measured values and alarm signals faded in. The measuring points are parameterized in direct dialog with the system, including immediate automatic documentation on a typewriter. The measuring points may also be parameterized during commissioning; subsequent corrections may be made at any time. All the data are stored in non-volatile memories, basic software in EPROMS and system-related parameters in magnetic bubble memories.

For further information on the SIMOS 41 system,

Circle 95 on Reader Service Card

IMODCO Names Frankel Chairman; Byrd And Allchorn Promoted

IMODCO, a unit of AMCA International Corporation, recently announced that **Bernard Frankel** has been named chairman of the company.

Mr. **Frankel** is widely recognized as a leading pioneer in the development of offshore marine terminal systems. He will concentrate on broadening and developing IMODCO's presence in the offshore products market and in the general marine industry.

Replacing him as president with overall operating responsibilities is Dr. **Robert C. Byrd** who joined IMODCO last year. He was previously vice president of Brian Watt Associates Inc.

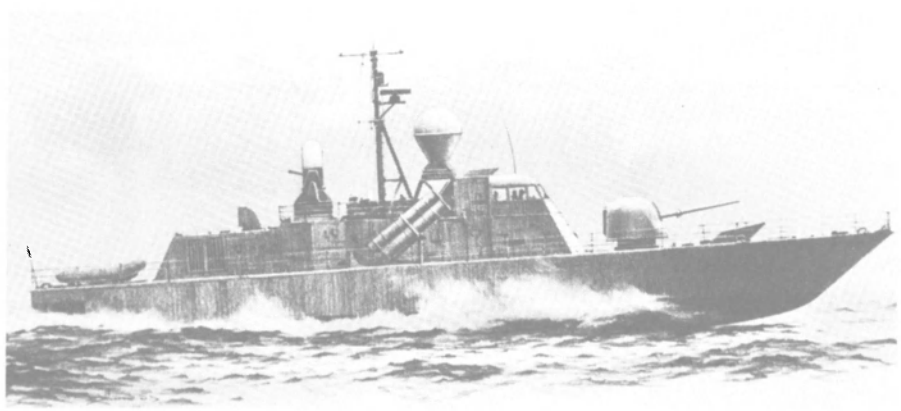
Alfred W. Allchorn, formerly senior vice president-marketing, becomes executive vice president with primary responsibility for the worldwide marketing of IMODCO products.

Grey Joins Polarmarine Group In London Office

Polarmarine Ltd. of Sweden and the U.K. have announced that Capt. **G.R. Grey** has joined the Group. Recently retired from BP Shipping, he has been involved with tank cleaning and oil pollution prevention and control procedures for many years, and was the leader of the Crude Oil Washing (COW) Project mounted by BP in 1972, which is now an international operational procedure.

Captain **Grey** has been responsible for organizing and lecturing at training seminars in Britain, France, Norway, and India for the personnel of more than 70 international shipping companies. He has also gone aboard many ships to give training and supervision in COW and inert gas operations worldwide.

He will be based in the London office of the Polar Group at 34 Ebury Street, London SW1W OLU: telephone 01-730-7158, telex 916957 POLAR G.



Allison Gas Turbines Will Power World's Fastest Patrol Boat

The H-3 Research & Development Group, Ltd. of Rancho Santa Fe, Calif., has announced the design of its new super fast patrol boat developed by **Edward H. Heinemann,** world-famous and innovative designer of airplanes and fast patrol craft. The H-3 (shown above) is a water jet, three-engine vessel powered by Detroit Diesel Allison gas turbine engines driving water jets supplied by KaMeWa AB of Sweden, through Cincinnati Gear Company's epicyclic reduction gears.

The patrol boat has an overall length of 47 meters, beam of 7.5 meters, and draft of 1.9 meters (154.2/24.6/6.23 feet). The full-load displacement is 239 metric tons.

The design is based upon an analysis of the problems that nations of the world have defending their shorelines, especially in rivers, estuaries, and shallow waters. A study was made of various hull materials including wood, steel, plastic, and aluminum, and this study clearly showed aluminum to be the best material. The hull will be constructed of marine aluminum alloy supplied by the Alcoa Company.

Provisions are made for various armament configurations, depending upon the user requirements and the release of American armament to the user. The recommended armament is a 75-mm Oto Melara bow gun, four McDonnell Douglas Harpoon type missiles carried at midship, and a General Dynamics Phalanx array mounted on the upper deck. With this armament, or the equivalent, the H-3 is believed to be the world's most effective boat of its type.

The gas turbine engines and jet thrusters make the H-3 especially effective as a patrol craft, as it has a top speed exceeding 50 knots, depending upon the amount of fuel remaining. It has exceptionally good turning and maneuvering performance, with the distinct advantage of being able to operate in shallow waters due to the absence of propellers. It is modern in every respect, but uses only concepts and equipment that have been well-proven in service.

Naval architecture and marine engineering has been handled by Nickum & Spaulding Associates, Inc. of Seattle. The building of the first hulls will be undertaken by The China Shipbuilding Trading Company Ltd. of Beijing, People's Republic of China. Negotiations for a parallel construction program in the U.S. are under way.

In February 1983, Mr. **Heinemann** and **Whitney Todd** of Intercontinental Financing Group, Ltd. were invited to visit China as guests of the People's Republic. In late 1983 an official delegation from China visited Rancho Santa Fe for further discussions. Subsequently, the H-3 Consortium made several visits to China during 1984, and in November that year an Agreement of Understanding was signed at the Official Guest House in Beijing by members of the Consortium and CSTC.

The H-3 Consortium members are: H-3 Research & Development Group, Ltd. (design); General Motors Oversea Distribution Corporation (Allison turbines); Cincinnati Gear Company (gears); KaMeWa AB, Sweden (thrusters); Aluminum Company of America (aluminum alloy); Intercontinental Financial Group, Ltd. (project financing); and Whitney Todd & Company (sales/financing).

Contecco Appointed Exclusive Sales Agent For Swedish Firm

Contecco, Inc., Springfield, N.J., has been appointed exclusive sales agent in the U.S. for Kvaerner Ships Equipment AB, of Gothenberg, Sweden.

This was jointly announced by Kvaerner's managing director, **Gustaf Stolk** and Contecco, Inc.'s president **J.H. Klewsaat.**

According to Mr. **Stolk,** this agreement is another indication of the commitment by Kvaerner to a worldwide coverage of the market for hatch covers, ramps, doors, lifts, car decks, and other cargo access and handling equipment. Together with Kvaerner's new partner, MGFE in Japan, the group has established itself as a major supplier of above equipment throughout the world.

Contecco, Inc. is well-known in North and South America for the supply and service of ships' cargo handling equipment, specializing in Stuelcken Masts® and other designs of heavy lift capacities.

For further information and free literature on Kvaener's products or Contecco's services,

Circle 97 on Reader Service Card

Southwest Marine Awarded Eight LST's

Southwest Marine San Pedro was recently awarded the Phased Maintenance Program (PMP) contract for: USS Racine (LST-1191), USS Cayuga (LST-1186) and USS Schenectady (LST-1185).

The contract includes eight repair availabilities, three for Racine and Cayuga and two for Schenectady being performed between April 1, 1985, and April 21, 1989. Two of the availabilities are Docking Phased Maintenance Availabilities. Many of SWM's personnel currently working on the AOR PMP at San Pedro will also work on the LST PMP. The option for the USS Racine has been exercised by the U.S. Navy.

The Amfish, a giant freezer/stern trawler built by Moss Point Marine was recently delivered to Searay Partners L.P. of New York.

Moss Point Marine Delivers Giant Freezer/Stern Trawler

Moss Point Marine Inc., Escatawpa, Miss., recently delivered ahead of schedule the Amfish, a new 219-foot freezer/stern trawler to Searay Partners L.P. of New York.

John Dane III, president of Moss Point Marine said "while we don't have statistics on all fishing vessels, we are confident that the Amfish is the largest U.S. built ship of her type to fish off the East Coast".

The unique vessel contains approximately 38,000 cubic feet of refrigerated storage space and is capable of processing and blast freezing up to 40 tons of fish products per day at −40° F.

The all steel fishing vessel is 219-feet long, has a 36-foot 6-inch beam and a 15-foot 9-inch depth. She is powered by a Bergen KRMB-9 diesel engine developing 2,250 bhp through a 9-foot-diameter controllable pitch propeller. A kort nozzel provides additional propulsion. She is classified ABS Maltese Cross A-1, has a design draft of 15-feet, speed of 15 knots, four Grenco air blast freezers, a Loran C radar and an SSB radio.

The 1,000-gt vessel can accommodate a crew of up to 40 people in one- and two-man cabins enabling round-the-clock operations.

London Is Site For First International Cruise Shipping Conference June 19-20

Cruise 85, the first international conference for all involved in the management, operation and services of cruise shipping, is scheduled to take place in the Hilton Hotel on Park Lane, London, from June 19-20, 1985. The event will be organized by the UK Secretariat of the well-known Ro-Ro Conferences.

The focus on the cruising sector of the leisure market will be particularly timely, as cruise companies are ordering new ships for expansion into new markets. Indeed, Norwegian Caribbean Cruise Line is reported to be looking at plans for a 4,000 passenger ship which would make it the biggest cruise vessel in the world. Proposals such as this, make the cruise market an exciting prospect for the future.

It is on the market and its future that the conference will open its debate, looking at how ships might evolve as self-sufficient "floating holiday centres," the ultimate in the "go-nowhere" cruise concept. This means, of course, increased attention to shipboard revenue sources, also an area of conference discussion.

In cruising, ship operations take on a hotel profile, and the various elements, concessionaire catering, provisions, baggage handling, waste disposal and—the largest overhead of all—reservations, will be examined at Cruise 85.

Cruise ship design is also moving into an innovative period. Futuristic concepts are now being evaluated by the leading owners and designers, but questions arise whether passengers may prefer to stay with the past and promenade on teak decking rather than Astroturf. Design aspects, including those affected by the regulatory bodies, IMO, US Public Health Service and the Classification Societies will be highlighted at the conference.

With cruise operators developing new itineraries, ports are becoming more aware of the facilities required to attract the ships, and thus become the cruise center of their particular coast. Aspects of the port interface and terminals will be discussed at the conference. The Scandinavian "overnight" cruise concept, and river cruises will also be featured in the program.

Details of Cruise 85 and its associated Exhibition can be obtained from the Cruise Secretariat, 2 Station Road, Rickmansworth, Herts, WD3 1QP, England. Telephone 0923 776363, Telex 924312.

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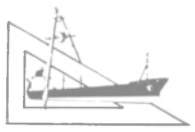

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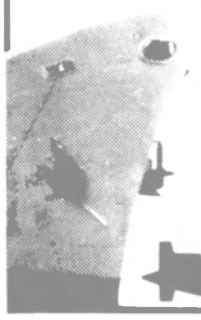

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McDermott Upgrades M/V Enterprise For Offshore Logistics

McDermott Shipyards recently delivered the M/V Enterprise to Offshore Logistics Inc. after upgrading it to meet the most demanding deepwater anchor handling requirements.

Offshore Logistics specifications called for modifications that would ready the Enterprise to meet the requirements for handling large floating rigs in the deepwater tracts currently being explored for the Gulf. McDermott installed a Fritz Culver double drum two-speed winch with chain loaders on the lower drum, rated to 420,000 pounds of line pull on each drum. Heavy-duty deck tuggers were added as well as underdeck chain-handling tuggers and Smatco storage reels capable of handling approximately 8,000 feet of 2.25-inch cable on the 200-foot 7,040-hp supply, towing and anchor-handling vessel.

Offshore Logistics' M/V Enterprise is ready to test its new deepwater equipment installed by McDermott Shipyards in Louisiana.

The Enterprise has been rebuilt above the main deck. The entire accommodation area has been completely redone, and the latest navigation and electronic equipment has been installed, along with improved fireproofing and insulation to reduce noise. The pilothouse has been extended and outfitted with controls both forward and aft.

The vessel has a 40-foot beam, 18-foot depth and admeasures less than 300 gt. It is driven by two Nohab-Polar F-216 engines with 3,520 hp generating a total of 7,040 bhp continuously at 825 rpm. It has a Western Gear 3.48:1 reduction gear, New England Trawler anchor windlass, two 120-inch-diameter, four-blade stainless-steel, controllable pitch, Bird-Johnson propellers, two 150-kw Delco generators, a GM 8V71N generator engine and a 550-hp bow thruster. It can accommodate 179,000 gallons of fuel oil, 15,000 gallons water, 5,245 gallons of lube oil, 227,341 gallons of ballast water and can accommodate a complement of 26. Electronics include two Furuno radars and depth sounder, an Anschuetz gyrocompass and a Stephens SEA 106-1 SSB radio.

Other boats that McDermott has worked on recently for Offshore Logistics are the M/V Starlight, M/V Equation and M/V Baccara.

New Marine Overcoat Sea-Slide™ Increases Speed, Saves Fuel —Literature Available

Hydromer, Inc., has developed a water-based urethane drag-reducing overcoat called Sea-Slide™. Designed for the commercial market, it is an easy-to-apply finish that reduces friction between the boat's hull and the surrounding water and is based on the principle that a surface where water skins produces less drag than a surface that causes water to bead.

Sea-Slide actually absorbs some of the surrounding water in an ultra-thin coating that binds a layer of water around the hull. Because the contact angle between the hull and the surrounding water is close to 0 degrees, water turbulences and drag are greatly reduced. In-use tests report drag reductions from 11 percent to 17 percent at speeds above 7 knots.

Gerald H. Gumpert, director of sales and marketing, said: "In-use tests by commercial fishing vessels have reported impressive fuel savings with Sea-Slide overcoat. In one report from the Gulf of Mexico, the skipper stated that at a constant 1,350 rpm, his speed increased from 6½ knots to 7½ knots, an impressive 15 percent fuel savings."

This confirms controlled experiments in which a weighted dinghy was towed around a quiet lake. A force gauge in the tow line indicated the force required to pull the boat before and after the coating was applied. Results indicated that at increasing speeds, a more substantial reduction in drag was attributed to the coating. At 20 knots, the coating reduced the water drag by a substantial 17 percent, while at lesser speeds, where drag exists, the Sea-Slide coating provided an 11 percent benefit.

Because of the unique properties of Sea-Slide, it permits normal leaching of anitfouling toxins and does not inhibit antifouling bottom finishes. According to the manufacturer, Sea-Slide rated excellent and superior over all kinds of antifoulant coatings in a comparison test with other bottom overcoat speed coatings.

The manufacturer also says that because Sea-Slide is a water-based urethane coating, it is easy to use and clean up after. There are no hazardous chemicals or complicated mixing required, and it may be used directly from can, applied by brush, roller or spray. It stays smooth and dries to the touch in 30 minutes, and cleaning is easily done with plain water. After curing (about three to four hours), the boat may be launched immediately or kept from the water indefinitely without losing its unique properties.

Sea-Slide may be applied over any bottom, with or without antifouling finish. It is economical to use, and one gallon covers approximately 750 square feet and is available in quarts or gallons. A single quart can covers the average 25-foot boat hull.

For complete information and literature on Hydromer's new Sea-Slide marine overcoat,

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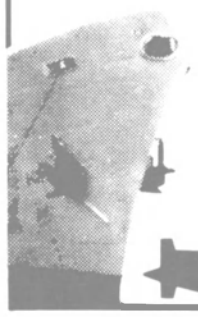

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McDermott Upgrades M/V Enterprise For Offshore Logistics

McDermott Shipyards recently delivered the M/V Enterprise to Offshore Logistics Inc. after upgrading it to meet the most demanding deepwater anchor handling requirements.

Offshore Logistics specifications called for modifications that would ready the Enterprise to meet the requirements for handling large floating rigs in the deepwater tracts currently being explored for the Gulf. McDermott installed a Fritz Culver double drum two-speed winch with chain loaders on the lower drum, rated to 420,000 pounds of line pull on each drum. Heavy-duty deck tuggers were added as well as underdeck chain-handling tuggers and Smatco storage reels capable of handling approximately 8,000 feet of 2.25-inch cable on the 200-foot 7,040-hp supply, towing and anchor-handling vessel.

Offshore Logistics' M/V Enterprise is ready to test its new deepwater equipment installed by McDermott Shipyards in Louisiana.

The Enterprise has been rebuilt above the main deck. The entire accommodation area has been completely redone, and the latest navigation and electronic equipment has been installed, along with improved fireproofing and insulation to reduce noise. The pilothouse has been extended and outfitted with controls both forward and aft.

The vessel has a 40-foot beam, 18-foot depth and admeasures less than 300 gt. It is driven by two Nohab-Polar F-216 engines with 3,520 hp generating a total of 7,040 bhp continuously at 825 rpm. It has a Western Gear 3.48:1 reduction gear, New England Trawler anchor windlass, two 120-inch-diameter, four-blade stainless-steel, controllable pitch, Bird-Johnson propellers, two 150-kw Delco generators, a GM 8V71N generator engine and a 550-hp bow thruster. It can accommodate 179,000 gallons of fuel oil, 15,000 gallons water, 5,245 gallons of lube oil, 227,341 gallons of ballast water and can accommodate a complement of 26. Electronics include two Furuno radars and depth sounder, an Anschuetz gyrocompass and a Stephens SEA 106-1 SSB radio.

Other boats that McDermott has worked on recently for Offshore Logistics are the M/V Starlight, M/V Equation and M/V Baccara.

New Marine Overcoat Sea-Slide™ Increases Speed, Saves Fuel —Literature Available

Hydromer, Inc., has developed a water-based urethane drag-reducing overcoat called Sea-Slide™. Designed for the commercial market, it is an easy-to-apply finish that reduces friction between the boat's hull and the surrounding water and is based on the principle that a surface where water skins produces less drag than a surface that causes water to bead.

Sea-Slide actually absorbs some of the surrounding water in an ultra-thin coating that binds a layer of water around the hull. Because the contact angle between the hull and the surrounding water is close to 0 degrees, water turbulences and drag are greatly reduced. In-use tests report drag reductions from 11 percent to 17 percent at speeds above 7 knots.

Gerald H. Gumpert, director of sales and marketing, said: "In-use tests by commercial fishing vessels have reported impressive fuel savings with Sea-Slide overcoat. In one report from the Gulf of Mexico, the skipper stated that at a constant 1,350 rpm, his speed increased from 6½ knots to 7½ knots, an impressive 15 percent fuel savings."

This confirms controlled experiments in which a weighted dinghy was towed around a quiet lake. A force gauge in the tow line indicated the force required to pull the boat before and after the coating was applied. Results indicated that at increasing speeds, a more substantial reduction in drag was attributed to the coating. At 20 knots, the coating reduced the water drag by a substantial 17 percent, while at lesser speeds, where drag exists, the Sea-Slide coating provided an 11 percent benefit.

Because of the unique properties of Sea-Slide, it permits normal leaching of anitfouling toxins and does not inhibit antifouling bottom finishes. According to the manufacturer, Sea-Slide rated excellent and superior over all kinds of antifoulant coatings in a comparison test with other bottom overcoat speed coatings.

The manufacturer also says that because Sea-Slide is a water-based urethane coating, it is easy to use and clean up after. There are no hazardous chemicals or complicated mixing required, and it may be used directly from can, applied by brush, roller or spray. It stays smooth and dries to the touch in 30 minutes, and cleaning is easily done with plain water. After curing (about three to four hours), the boat may be launched immediately or kept from the water indefinitely without losing its unique properties.

Sea-Slide may be applied over any bottom, with or without antifouling finish. It is economical to use, and one gallon covers approximately 750 square feet and is available in quarts or gallons. A single quart can covers the average 25-foot boat hull.

For complete information and literature on Hydromer's new Sea-Slide marine overcoat,

Circle 93 on Reader Service Card

PROPULSION UPDATE

Cummins Announces New Increased Power Ratings For Their NT(A)855-M And KT(A)19-M Marine Engines

Cummins Engine Company has announced additional increases to engine horsepower ratings for their NT855-M, NTA855-M, KT19-M and KTA19-M marine models. Increased horsepower ratings for the NTA855-M and KTA19-M models were made available in early 1984 as a result of new turbocharger modifications that provided improved fuel consumption in addition to the higher power ratings.

Now, this manufacturer is offering increased power ratings on all four, in-line, six-cylinder marine models while still maintaining a fuel consumption rate highly competitive with most other engines in their size and power range.

Following is an outline of the increased horsepower ratings announced by Cummins.

NT855-M—Formerly rated 295 bhp @ 1,950 rpm, *Intermittent Rating,* now available at 360 bhp @ 2,100 rpm. The *Continuous Duty Rating* has been increased from 270 bhp to 300 bhp @ 1,800 rpm with shaft horsepower (shp) calculated at 291 and fuel consumption at 15.1 gallons per hour, (gph), or .052 G/shp hr.

NTA855-M—*Intermittent Ratings* of 400 bhp @ 2,100 rpm and *Continuous Duty Ratings* of 350 bhp @ 1,800 rpm were released and first available in early 1984. At the *Continuous Rating,* shp is 340 with fuel consumption at 17.8 gph or .052 G/shp hr.

KT19-M—The *Intermittent Rating* of 510 bhp @ 2,100 rpm has been available since early 1984. The *Continuous Duty Rating* is now being increased from 365 bhp to 425 bhp @ 1,800 rpm. Shp is calculated at 412 with fuel consumption at 20.7 gph or .050 G/shp hr.

KTA19-M—The *Continuous Duty Rating,* first available in early 1984, is set at 500 bhp @ 1,800 rpm with shp at 485 and fuel consumption at 25.2 gph or .052 G/shp hr.

Cummins Intermittent Ratings are intended for continuous use in variable load applications where full power is limited to six hours out of every 12 hours of operation. Reduced power operation must be at or below the Continuous Power Rating rpm.

The Continuous Duty Rating is intended for continuous use in applications requiring uninterrupted service at full power. This rating is the ISO 3046 standard power rating and SAE J1228 continuous crankshaft power.

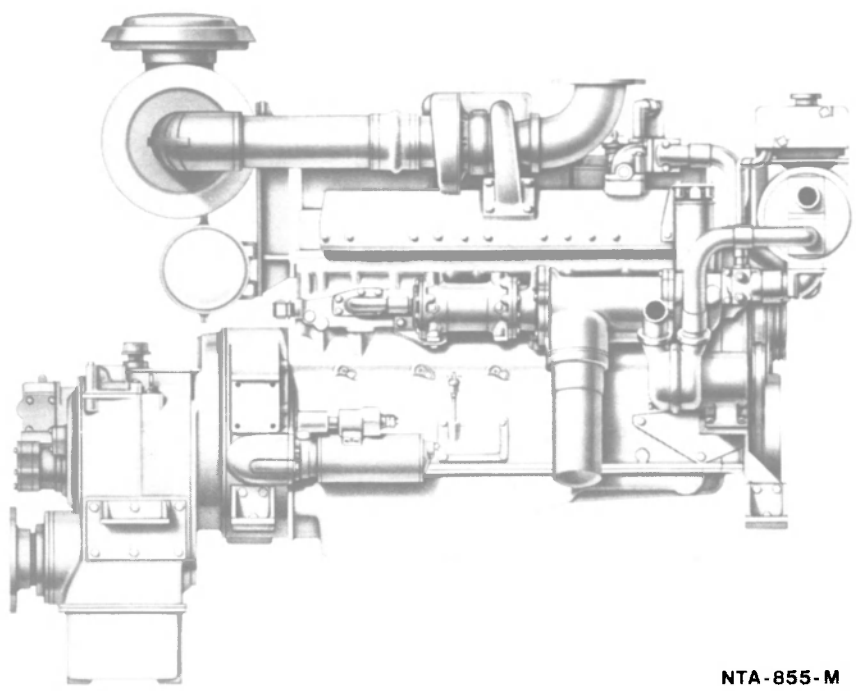
These new ratings adhere to the American Bureau of Shipping design criteria and can be certified in those applications where required.

For free brochures containing complete technical data and information on Cummins Marine Models NT855-M, NTA855-M, KT19-M and KTA19-M,

Circle 26 on Reader Service Card

For a brochure describing the complete line of Cummins diesel engines,

Circle 27 on Reader Service Card



NTA-855-M

Emulsion Fuels International Announces Supply Agreement With Exxon Chemical

Emulsion Fuels International, Inc. (EFI), New York, N.Y., a leading developer of products that enhance fuel efficiency, has entered into a supply agreement with Performance Chemicals Division of Exxon Chemical Americas of Houston, Texas, a leading manufacturer of a wide range of petrochemicals, from basic chemical feedstocks to small volume, high-performance specialties, it was recently announced by EFI president **David Robinson**.

Under terms of the agreement, Exxon Chemical will provide a series of specially formulated products to EFI on an exclusive basis. These chemicals, along with EFI's specially designed mixing equipment, are a key element in producing stable water-oil emulsions.

EFI is the developer of the energy-saving emulsion EF-6, a low-cost, ready-to-use mixture of oil and water that is used in hundreds of commercial, industrial and apartment buildings as an alternative to common #6 fuel oil.

The technology developed by EFI overcomes the combustion deficiencies of fuel oil by increasing thermal efficiency by up to 12 percent and reducing emissions of harmful particulates into the air by up to 90 percent. EFI has documented this improved performance in field tests conducted by independent environmental testing laboratories.

Since its introduction in 1982, over 100 million gallons of EF-6 have been produced and sold by oil companies using the EFI technology.

Because EFI has found that different fuel oils on the market require different stabilizers, the agreement with Exxon Chemical will allow EFI to apply its technology to produce emulsions for a wider variety of fuel oils. EFI will run daily tests on fuel samples at its laboratory in Thorofare, N.J., to determine which of these formulations will be used for each type of oil.

EFI will also use Exxon's chemical products to penetrate new markets. Currently, an EF-6 fuel made with Exxon Chemical products is being tested at a major electric utility for the first time to solve particulate emission problems.

"Utilities are having problems meeting air pollution standards because the asphaltene-heavy fuel oils they use don't burn cleanly," stated energy scientist Dr. **John Dooher** of Adelphi University Energy Center. EFI's technology reduces particulate emission and stack build-up, thus providing utilities—which burn over 200 million barrels of oil a year—an alternative to investing in multimillion-dollar stack collection equipment.

The supply agreement with Exxon Chemical Americas will also assist EFI in its project to apply emulsion technology for use in steam generating ship boilers and in large maritime diesel engines that operate on #6 bunker fuel. Over 150 million barrels of oil are burned in these vessels.

The benefits of mixing water and oil as a means of boosting energy efficiency have been known for years. Because fossil fuels, such as coal and oil, only burn on their surfaces, some of the fuel is not burned. The unburned carbon is deposited in the boiler as soot or goes up the stack as an emission. By adding water to the oil, the surface area of the fuel is increased when it is shattered into tiny droplets, thus allowing more thorough combustion and cleaner burning.

Previously, this process was difficult and required complicated and expensive mixing equipment to be installed on heating systems. EFI's sophisticated approach to the problem created a breakthrough. By discovering the technology needed to produce a stable mixture of oil and water, EFI can install special mixing equipment at distribution centers, allowing oil companies to mix and handle EF-6 just like regular fuel oil.

Tests conducted in Washington, D.C., and at Rockefeller University in New York City demonstrate the improved performance of EF-6. In Washington, D.C., where environmental restrictions on particulate emissions effectively prohibit the burning of #6 oil, tests show that EFI's fuel formula reduces particulates well below allowable levels. Because of its effectiveness, EF-6 has been approved by the D.C. Bureau of Air & Water Quality.

Boilers at Rockefeller University in New York City also found the advantages of EF-6. These boilers, which are similar to the kind used extensively by industry, contain sophisticated computer monitoring equipment that allowed measurement of the effectiveness of EF-6. The data from those tests demonstrates that EF-6 burned more completely and cleanly than conventional fuel oil. Thus, burning EF-6 offers a cheaper alternative than higher priced distillate fuels or multimillion-dollar stack collection equipment.

EFI is continually improving its product performance. The quality control laboratory recently established in Thorofare, N.J., runs extensive stability tests on fuel samples. In addition, a team of combustion engineers regularly conduct on-site efficiency and pollution control tests to assure EF-6 is producing desired results for customers.

Some of the country's largest fuel oil marketing companies are major customers of EFI, including Apex Oil Co., Steuart Petroleum Co., Northville Industries, Gladieux Refining, Burnside Fuel Co., Swann Oil Co., and other regional fuel companies.

With current sales at $1.5 million,

EFI projects its agreement with Exxon Chemical will help push revenues past $5 million by the 1985-6 fiscal year.

For more information,

Circle 23 on Reader Service Card

Matson Will Convert Trailership To Combination Containership-RO/RO

Matson Navigation Company of San Francisco has announced plans to convert its 700-foot trailership Matsonia to a combination lift-on/lift-off containership and roll-on/roll-off cargo carrier, and enlarge the vessel to provide nearly three times her present capacity.

Plans approved by the company's board of directors call for redelivery of the reconstructed vessel by the fall of 1987, "to meet the increasing requirements of our customers in the West Coast-Hawaii trades," Matson president **John C. Couch** said.

The reconstruction, which will be done in an American shipyard, will be similar to the 1982 lengthening and conversion of the Matsonia's sister ship Lurline. It will also incorporate the improved fuel economy and cargo capacity features added to the Lurline in 1984.

"The success of the Lurline has demonstrated the efficiency and flexibility we can expect from addition of the Matsonia to the fleet as a LO/LO-RO/RO carrier," Mr. **Couch** said. "The fleet of two combination carriers and our four big containerships will be the most efficient ever to serve the trade, and will provide the capability of increasing our sailing frequency from all West Coast ports."

The converted Matsonia will carry about 1,320 twenty-four-foot equivalents, similar to the Lurline, but will have "garage" storage space for 366 automobiles, compared with 237 on the Lurline. Both vessels were built in 1973 by Sun Shipbuilding as RO/RO trailerships.

"Houdideas" Introduced By Houdaille Hydraulics

Houdaille Hydraulics, Buffalo, N.Y., a major vibration damper and shock absorber supplier, has introduced a reference series of newly developed design aids for solving vibration and motion control for the OEM designer.

Called "Houdideas" they will consist of a series of one-page data sheets describing new product concepts that could be used to solve vibration problems.

For the first set of six Houdideas,

Circle 33 on Reader Service Card

NcNab Now American Supplier Of Aquacatch® Speed Through Water Log

McNab, Inc., Mt. Vernon, N.Y., a U.S.-based marine electronic instrumentation manufacturer and supplier, has announced it is now the exclusive American supplier of the Aquacatch® speed through water log, manufactured by Chernikeeff Instruments Ltd. of England. The Aquacatch, McNab says, is a fully electronic speed through water and distance travelled indicator that has been proven simple to calibrate and operate in hundreds of installations throughout the world over the past 10 years.

The system is comprised of an electromagnetic, hull-mounted sensor (fixed and retractable models available) and an illuminated, analog indicator panel. Both digital and analog repeaters are available. A built-in, two-point calibration circuit is standard, and the manufacturer claims ±1% accuracy at the upper and lower calibration points, with ±5% accuracy overall. Present users of the instrument express satisfaction with its extreme reliability and minimal maintenance requirements.

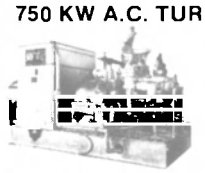
McNab also supplies torque and shaft horsepower indicating systems, shaft thrustmeters, computer-based fuel efficiency monitors, oil in water monitors, salinity and chemical dosing monitors, and marine window wipers.

For more information on the Aquacatch speed through water log, or other marine products available from McNab,

Circle 50 on Reader Service Card

MARINE EQUIPMENT FOR USE ASHORE OR AT SEA!

750 KW A.C. TURBO GENERATORS



Ex-USN — GEI-16846 — type FN3-FN24 — seven stage — 10033 RPM — typical serial # 49351 or 61718. Single helix reduction gear — 10033/1200 RPM — type S-187 GENERATOR, 750 KW — 6-pole 0.8 P.F. — 450/3/60/1200. EXCITER 10 KW — 120 volts. Steam inlet flange 2½" — exhaust 17¾" X 25 ½" rectangular. Overload 25% 2 hours. Units can be upgraded to 1250 KW for USN applications. Complete with throttles, etc. 8 Available

1500 KW TURBO GENERATOR SET

11-Stage turbine — FN4 — 8145 RPM — 3" steam — 525# — 825 TT GEARS. 195-8145-1200 RPM GENERATOR 1500 KW — 450/3/60/1200 RPM — 2405 amps — 0.8 P.F. EXCITATION: 13.2 KW — 120 volts DC. Weight 36,000 lbs — exhaust flange 18" X 38"

L.P. 450KW A.C. TURBO GENERATORS

Suitable for waste heat turbo generators on motor ships

175 PSIG — D&S — 27" vacuum. GENERATOR Westinghouse 450KW — 563KVA — 450/3/60—1200 RPM. GEAR 6097/1200 RPM. TURBINE 175 lbs/D&S—27" vacuum. Other pressures & temps 250# @ 40°C—27" vacuum. Turbine serial #780'-802. OAL 13'-1-3/16"—OAH 5'-OAW 5'-". Total dry wt. 17,100 lbs. Plans on request

TURBINES/ROTORS REDUCTION GEARS

ROTORS: DRU-618M-73 — 700 KW — 10938 1200 RPM — GEI 90755 — 850 DIAPHRAGMS. Labyrinth — bearings. GEARS: S-432 — Form B — 10938 120

G.E. ROTORS: 600KW — 700KW — 618M — 6-stage — 10022 RPM — G.E.I. 34822 GEAR S-277A — 10022 1200 RPM — MARAD units

G.E. ROTOR: DRU-318 — MRI non-condensing — 10938/1200 — 24 lbs

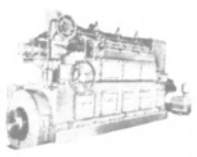
DeLAVAL TURBO GENERATOR SETS. ROTOR 7-stage class CD — 5910 RPM. REDUCTION GEAR type KD — 5910/1200 — double helical. Newport News hulls 499-504. Some Sparrows Point hulls

DeLAVAL 1000 KW TURBO GENERATOR SET ROTOR 1442 HP — Class G.J.N. — 10009 RPM — 9-stage

300KW GM 8-268A 120/240 DC DIESEL GENERATOR SET

ENGINE GM 8-268A — 6 x 7 — 1200 RPM. Heat exchanger cooled — equipped with heavy duty coolers. Just overhauled and can be seen running. Good condition

NEW CLARK 500 BHP DIESEL



500 BHP @ 400 RPM. 4-Cylinder straight inline type — 12" X 16" — 2-stroke single acting — liquid cooled — direct reversible — CW rotation. With standard shaft-connected starting air compressor. Wt 25,000 lbs — 228" long — 98" wide — 132" high. Designed for heavy duty, rugged use, its extreme simplicity will result in lower operating and maintenance costs

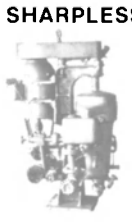
MATCHED PAIR 900 HP GM 12-567A DIESELS W/ FALK REVERSE & REDUCTION GEARS

ENGINE GM 12-567A 8 x 10 2-cycle V-type — 747 RPM — electric starting. GEAR Falk Airflex reverse & reduction — 2.48:1 forward — 2.52:1 reverse. From USN LST

UNUSED FARRELL-BIRMINGHAM MAIN PROPULSION REDUCTION GEAR

Single reduction 1.81:1. Will handle up to 3200 HP input at 402 RPM. Complete with hydraulic coupling. Port

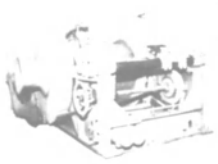
SHARPLESS OIL PURIFIER



225 GPH — type M85-34-5-23-BY-44 — bowl speed 17,000 RPM — 2 HP — 440/3/60/3400 RPM. Reconditioned

$3950

ALMON JOHNSON CONSTANT TENSION LST STERN ANCHOR WINCHES WITH ALL CONTROLS

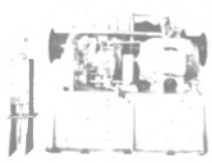


Drum capacity 900' of 1" wire. Gypsy performance 12,000 lbs @ 125 FPM. OAL 12'-CAW 10'1". Driven by 50 HP 230 VDC 181 amp motor. 2 Available with controls

PERFORMANCE

	Max. Control	Auto. Tension Control	
Line Speed	100,000 lbs	26,000 lbs	3000 lbs
Line Tension	10 FPM	Stall	400 FPM

50HP VARIABLE SPEED ELECTRO-HYDRAULIC CARGO WINCH

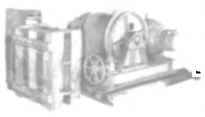


Made by Lakeshore. DUTY 7400 lbs S.L.P. — 220 FPM — drum size 24" diameter — 15" wide. Complete with ratchet & pawl. CAPACITY 600' of 1" wire. MOTOR 50 HP — 440 volts — 66.3 amps — 3-phase 60 cycle — squirrel cage — 1200 RPM constant — Frame CC-445-N

7X10 AH&D 10,000 LB CARGO WINCHES

2-Speed single drum — reverse throttle operation. LINE PULL low gear 10,000 lbs — high gear 5000 lbs. LINE SPEED low gear 125 FPM based on 1st layer of 1" diameter rope — high gear 250 FPM based on 1st layer. 26" diam. DRUM 26" diam — 20" long — 26" flange diam. Rope capacity of drum — diam. rope in 6 layers — 650' — 1" diam. rope in 8 layers 1200'. Steam pressure at throttle 115 lbs. Operating weight 6450 lbs

GENERAL PURPOSE WINCH 3500 LBS AT 200 FPM



New — Unused — Ex-USN A.C. Motor drive — 25.12.5 HP — GE 440/3/60 — 40°C AB — 1750 RPM — Type KR — full load amps 32. Motor drives winch through Falk reduction gear. Has compression hand brake

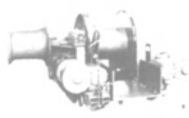
LARGE STEAM TOWING ENGINE 9X10 TWIN ENGINE DRIVE

Air or Steam — 125-250 PSI. Heavy duty Clyde with 36" diam. X 51" Face single drum. Flanges 68". CAPACITY up to 2800' of 2" wire rope. Normal line pull 40,000 lbs @ 50 FPM. Steam or air pressure required 125 to 250 PSI. Can be adapted to electric drive or increased steam or air pressure to a capacity of 82,000 lbs @ 20 FPM. Pawl holds 270,000 lb pull from any layer. Equipped with level wind device. Approx wt 30,000 lbs. DIMENSIONS 12'6" wide — 6'6" high. Write for details. ALSO AVAILABLE. Large towing ring — 36" diameter

12" X 14" STEAM MOORING WINCHES

Steam Or Air Driven with foot brake & declutchable gypsy head 20,000 LBS @ 100 FPM — FIRST LAYER

ALSO HANDLES 16,000 LBS @ 150 FPM OR 50,000 LBS @ 8 FPM



Drum will stow 1500' of 1" wire in 9 layers. Steam inlet 3" — 4" exhaust — 171 PSI working pressure. BASE DIMENSIONS 6' X 6'3" — overall 8'4" wide X 9' long. Mfg by Friedrich Kocks — Bremen, Germany. Remover from ARCO Challenger. ALSO IN STOCK — 12" X 14" Double gypsy unit. Can be demonstrated running

UNUSED STEAM WINCH FOR MOORING & CARGO SERVICES

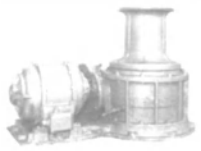
Lidgerwood 10X12 with Morse controls. 10,000 lb. line pull — declutchable gypsy — hand compression brake

SMALL 4 X 6 WINCH

STEAM OR AIR

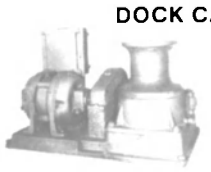
DRUM 20" Diameter X 23" width — 8" flange. Rated 2000#/90 FPM on 3rd layer of rope. 125# Steam or 3500 @ 90 FPM 150 PSI steam. 13,000 lb. static load. Fitted with ratchet & pawl so drum can be locked in off and on position

HEAVY DUTY 2-SPEED DOCK CAPSTANS



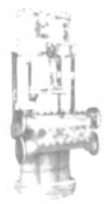
For tugs, docks, etc. Suitable for manila or wire rope because barrel is ridged. 40/40 HP — 1200/600 — 24,000# @ 30 FPM — 12,000# @ 60 FPM. Barrel size 22" diameter by 24" high — with controls

DOCK CAPSTANS



Spool 10" diam. X 4" — 15 HP — 220/440/3/60. 10,000 lbs @ 40 FPM. 48" Long — 32" wide — 28" high

DEAN BROS. ALL-BRONZE STRIPPING PUMP BILGE & BALLAST 12 X 10 X 18



Max. pressure 730 GPM @ 200 lbs — steam end 250 lbs. Serial 67735. OA Dimensions: 43" wide — 39" deep — 104" high. Complete with spare unused bronze valve deck & spare liquid lines piston, steam end spares, rods, etc. This pump ready for immediate use — equal to new — little if any use.

WORTHINGTON 16" X 14" X 18" VERTICAL DUPLEX STRIPPING PUMP

1400 GPM @ 110PSI — suction lift 11.5 ft — steam back pressure 15 lbs. 14" Suction — 10" discharge — 2" steam — 4" exhaust. Overall width 6'8" — overall height 9'1" — depth 3'9". Wt approx 10,000. Reconditioned 1980 ABS — ready to go

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Mfg by Hypro — type L — 25 HP — 220/440/3/60 — Frame 284T. Pump capacity 25 GPM @ 500 PSI — 600 RPM

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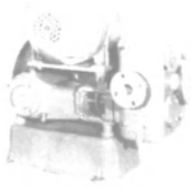

For sanitary and potable water use. 30 GPM @ 90 lbs. 190 RPM — 2" suction — 1½" discharge. GE motor — 2 HP — 440/3/60. 1735 RPM

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Style A has flush deck mounting flange with 24½" diameter bolts. Style B has extended deck mounting flange with 20½" diameter bolts

21" & 24" I.D. MAN-WAY 3-DOG HATCHES

18" Coaming. Available with T socket-wrench or removable handwheel (can be welded in place) for top opening. Spring-loaded lid w/inside handwheel. Coaming 12mm thick — top 11mm. Bosmet drawing #67-56

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Handwheel top & bottom. 4-Dogs. 16"X24" with 5" coaming. Drawing #60-40

4-DOG GENERAL PURPOSE 15"X23"X5" HATCH

QUICK-ACTING 4-DOG HATCHES

Heavily constructed. Handwheel operated. Handwheels top & bottom. Size A: 27" X 21" w/12" coaming. SIZE B: 31"X31" w/12" coaming. For ocean-going barges, etc.

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36" Diameter — 26" coaming — 7-dog drop-bolts. Drawing 36/26

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36" X 48" — 24" X 36" DECK HATCHES

Has 10 brass dogs — 18" coaming. Coaming is 12mm — top is 11mm.

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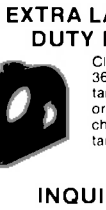

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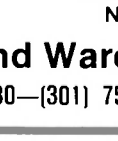

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SALE SITE: Marine Services Corp at Lake Ferguson Rd (Uptown)

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GENERAL DESCRIPTION: Vessels are an all welded const. w/raked bow, square stern, quad. screw, typical inland tow boat design w/flat hull bottom, tunnels over props. (4) main rudders & (6) flanking rudders. Above main deck is a 4-level superstructure w/galley, mess and machinery areas, crew's quarters, staterooms and Pilothouse on upper level forward.

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LENGTH (Reg.) 170.0'; **BEAM (Reg)** 58.0' **DEPTH (Reg)** 10.3' **NET TONS** 755.00; **GROSS TONS** 1,111.00; **OFFICIAL** #283441; **BUILDER:** St. Louis Shipbuilding & Steel Co., St. Louis, MO **MACHINERY:** (4) Cooper-Bessemer LS-8-DRT, 8-Cyl In-Line Turbo Diesels (Totalling Appx. 9,000-HP) Main Eng. Drive Individual Prop. Shafts via Western Reduction Gears (Eng. & Control Sys. overhauled in '82—Cost: $1,500,000.00). (3) Delco 125-KW Gen. pwrd by Detroit 6-110 Eng. (4) G-D ABD-6000 Air Comp pwrd by 15-HP Elect. Motors.

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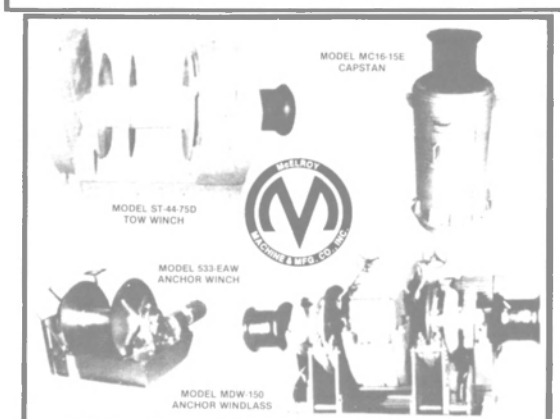

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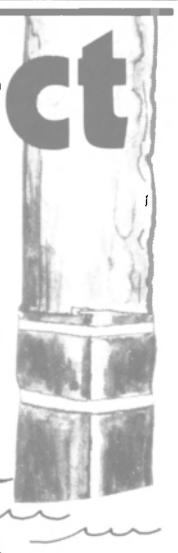

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The PacTow tug Peter Foss is shown towing the MSC tanker Shoshone from San Francisco to Los Angeles where she was refitted by Southwest Marine Shipyard. PacTow is a Dillingham Maritime company.

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ASCARGO of Bilbao, Spain, which is represented in the U.S. by Borgne International Corporation, Middlesex, N.J., is offering free literature on the cargo access equipment the company manufactures.

Using a colorful cutaway drawing of a vessel, the brochure attractively depicts ASCARGO equipment for roll-on/roll-off and side and vertical loading equipment variations.

Shown in its appropriate location in the drawing of the vessel, and numbered so that the corresponding numbered description can be seen at a glance, are such ASCARGO items as: (1) stern ramp; (2) combined watertight side ramp; (3) watertight door; (4) combination of a side door and an adjustable platform;(5) access ramp to a car deck; (6) hoistable cardecks; (7) folding cover with direct cylinder and multifolding with internal cylinders; (8) 'tween deck side-pivoting, hydraulically operated; (9) bulkhead door; (10) hydraulically operated elevator; (11) horizontal stowing of hatch covers by means of hydraulic cylinders; (12) Balanlift hatch covers; (13) 'tween deck flush folding hatch covers; (14) side pivoting cover; (15) scissors type elevator; (16) side rolling operated by hydraulic motors; (17) liftaway pontoons; (18) sliding bulkhead door; and (19) combination bow visor and bow ramp. Color photos are used to show many of these items in action.

Since ASCARGO was founded, thousands of repairs and modifications to existing hatchcovers of any type and design have been carried out, and the last page of the literature is devoted to ASCARGO repair maintenance and innovations. The company has a team with experience in any kind of repairs such as to rebuild very deteriorated covers and to have them watertight to the satisfaction of the classification society and shipowners, or hatches with mechanical problems. ASCARGO is also prepared to improve the operation of an existing hatch by modifying it to hydraulic, etc. Color photos of various repairs in progress are used to illustrate this last page.

For more information and a free copy of the brochure on cargo access equipment from ASCARGO,

Circle 57 on Reader Service Card

Baldt 'Engineering Innovations' Bulletin Highlights Moor-Free™ Rapid Release System

Baldt Incorporated has announced the immediate availability of a four-page, two-color "Engineering Innovations" technical bulletin (#002) that details the Baldt Moor-Free Rapid Release System. This sophisticated computer assisted system allows rig operators to safely free a vessel from its moorings four times faster than previously possible.

The bulletin provides detailed technical information, illustrations, specificaitons, and photographs of all Moor-Free Rapid Release System components. As detailed in the publication, the basic system consists of Baldt's unique disconnect link armed with a detonating bolt assembly and acoustic receiver, which is installed into the mooring system in a similar fashion to the standard Baldt chain connecting link. The disconnect link is then lowered below the water surface and detonated by an acoustic signal. The signal originates at a command transmitter and travels to the detonating bolt assembly via an underwater acoustic transducer. Once detonation occurs, the mooring is released and the rig may be moved out of danger.

Engineering Innovations Bulletin 002 also provides information on coaxial cable detonation rather than acoustic detonation for applications such as launching, towing, fleet mooring, and other situations where kinking and pinching of the cable cannot occur. Also detailed in the bulletin is Baldt's worldwide training program, warranty, and inspection services agreement.

The Baldt Moor-Free System is available immediately. Designed for maximum user safety, the self-contained system quickly and safely releases vessel moorings without the assistance of support vessels.

For a free copy of the 'Engineering Innovations' bulletin from Baldt,

Circle 59 on Reader Service Card

New Fel-Pro Maxi-Coat Spray Protects Marine Equipment From Saltwater Rust And Corrosion —Literature Available

Metal equipment and components used or transported aboard ships or stored in salt-water environments can easily be protected from rust and corrosion by spraying them with a new Fel-Pro Maxi-Coat aerosol protective coating. The

Maxi-Coat spray can supplies a thick, heavy-duty, non-greasy film protection which will not wash off in salt water or melt in direct sunlight.

For further information on Fel-Pro's new Maxi-Coat spray,

Circle 15 on Reader Service Card

Shipboard Computer Distributed By Magnavox Displays Detailed Charts, Automates Navigation

Geonav, a shipboard computer distributed by Magnavox, displays nautical charts with coastline and other information the navigator requires. Designed as an integrated navaid, the computer interfaces with Loran and satnav receivers, autopilots, and other marine electronics to capture and process data.

Geonav replaces a screen full of cryptic numbers with easily grasped visual information. Its high-resolution graphics are shown on a high-persistance, anti-glare screen for ready viewing in marine environments.

Through computer image processing, Geonav automatically performs the complete range of navigation operations. These include scanning the chart, reading coordinates from navigation receivers, plotting present position on the chart, laying a course, computing waypoint coordinates, distances, and headings, and steering the ship through a plotted course.

The system is self-explanatory and easy to use with its simplified keyboard and trackball, which operates much like a mouse. The navigator plugs in a solid-state memory cartridge containing linked, adjacent charts. The navigator quickly selects the appropriate map, then uses the system's zoom and pan features to concentrate on areas of particular interest.

Memory cartridges incorporate Geomarine digital cartography that blankets the world's coastlines, including main rivers and lakes, plus navigation landmarks. An enormous amount of information can be displayed on the screen, with a resolution of better than 200 meters. Duplicating this level of detail on printed maps would require a 150-square-foot charting table and a large, bulky chart library.

Total capabilities of Geonav include plotting and calculation of all navigation data—geographic coordinates of way points; leg and total distances; true, magnetic, and compass headings; time en route, even fuel consumption for diesel engines. Using the keyboard and trackball, the navigator can draw lines on the screen to create and compare routes in great detail.

Geonav is supplied with one memory cartridge covering the purchaser's choice of chart groupings, with additional cartridges available as options. A mounting bracket and instructions are included for simple installation. The footprint of the compact system is slightly larger than that of a legal pad. Power requirements are also modest; Geonav draws 20 watts from its 18-40V power supply.

Geonav is manufactured by Navionics S.p.A. of Viareggio, Italy. Magnavox handles sole distribution for North and South America, as well as most nations in the Far East and Southeast Asia.

Sales and service on Geonav are available through authorized Magnavox marine dealers.

For further information on the Geonav shipboard computer distributed by Magnavox,

Circle 91 on Reader Service Card

Clemco Pipe Cleaning Tools Blast-Clean Pipe Interior Without Rotating The Pipe

Clemco Industries of Burlingame, Calif., is offering a family of internal pipe cleaning tools—Spin-Blast, Hollo-Blast, and Hollo-Blast Junior—designed to blast clean the interior of pipe or tubing ranging in size from ¾-inch to 36-inch I.D., without rotating the pipe.

Used in conjunction with standard abrasive blast machines, pipe cleaning tools simply replace conventional blast nozzles at the end of the hose. The Spin-Blast Tool incorporates a rotating head with two nozzles to propel abrasive to the surface. The Hollo-Blast Tool utilizes a deflection tip to direct abrasive to the surface, and the Hollo-Blast Junior utilizes a deflection tip like the Hollo-Blast, but with smaller proportions to accommodate pipe with inner diameters of ¾-inch to 2 inches. Through this highly powered abrasive impact, precise surface profiles can be obtained, which will ensure proper adhesion for long life coatings.

Various Tungsten Carbide nozzle sizes are available to comply with the range of pipe diameters. Internal pipe surface preparation is said to be easier, faster and more economical with the Clemco Internal Pipe Cleaning Tools.

For more information on the Clemco Family of Internal Pipe Cleaning Tools,

Circle 60 on Reader Service Card

FOR MORE INFORMATION
ON
EQUIPMENT AND SERVICES ADVERTISED IN THIS ISSUE

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BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all 24 issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR/EN assumes no responsibility for errors. **If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 477-6700.**

AIR COMPRESSORS
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
Squire-Cogswell Company, 3411 Commercial Ave., Northbrook, IL 60062

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Flakt AB, Box 8862, S-40272, Gothenburg, Sweden
Marlo Coil/Nuclear Cooling, Inc., P.O. Box 171, High Ridge, MO 63049
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrkoping, Sweden

ANCHORS AND CHAIN
Baldt Incorporated, P.O. Box 350, Chester, PA 19016
G.J. Wortelboer Jr. B.V., Eemhavenstraat 4, P.O. Box 5003, 3008 AA Rotterdam, Netherlands

ANODES—Cathodic Protection
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Engelhard Industries Division, 2655 U.S. Route 22, Union, NJ 07083
Federal Harco, P.O. Box 40310, Houston, TX 77240

BALLASTS
Genstar Stone Products Co., Executive Plaza IV Hunt Valley, MD 21031

BASKET STRAINERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

BEARINGS—Rubber, Metallic, Non-Metallic
Grant Manufacturing & Alloying, Inc., 600 Schoolhouse Rd., Souderton, PA 18964
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, OH 44309
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, WI 53186

BLASTING—Cleaning—Equipment
Aurand, 1270 Ellis St., Cincinnati, OH 45223
Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
CLEMCO, P.O. Box 7680, San Francisco, CA 94120
E.I. DuPont De Nemours & Co., Inc., Starblast Division, Room X39186, Wilmington, DE 19898
Key Houston Division of Jacksonville Shipyards, 13911 Atlantic Blvd., Jacksonville, FL 32225

BOILERS
Combustion Engineering, Inc., Windsor, CT 06095

BOILER CLEANING
Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645

BROKERS
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, LA 70153
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Western Maritime, 701 B Street, San Diego, CA 92101

BRONZES—COMMEMORATIVE
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

BUNKERING SERVICE
Belcher Company, Inc., 8700 West Flagler, P.O. Box 525500, Miami, FL 33152
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144

CARGO HANDLING EQUIPMENT
MacGregor-Navire International, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016

CASTINGS/FORGINGS
NKS Industria Pesada, Grupo Industrial, Reforma 404, 140 Piso, Mexico, D.F. 06600 U.S. REP.—Lexington Transport (New York) Inc., 551 Fifth Ave., Room 910, New York N.Y. 10017

CHOCKING SYSTEMS
Philadelphia Resins Corp., 20 Commerce Drive, Montgomeryville, PA 18936

CLOSURES—Marine
Cornell-Carr Co. Inc., 63 Main St., Monroe, CT 06468
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

COMPUTERIZED INFORMATION SYSTEMS
Marine Management Systems, Inc., 102 Hamilton Ave., Stamford, CT 06902
Maritime Data Network, Ltd., 102 Hamilton Ave., Stamford, CT 06902
Military Contract Information Service, Inc. Dist. by Maritime Reporter/Engineering News, 118 East 25 St. N.Y. N.Y. 10010
TIMSCO, 622 Azalea Rd., Mobile, AL 36609
Veson Systems, 29 Broadway, Suite 1002, New York, NY 10006

CONDENSERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

CONTROL SYSTEMS—Monitoring
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
ASEA, Inc., 4 New King St., White Plains, NY 10604
Autronica Marine USA, 280 Industrial Pkwy., Northvale, NJ 07647
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W 5G2
Biospherics Inc., 4928 Wyaconda Rd., Rockville, MD 20852
Bowmar/ALI, Inc., 531 Main St., Acton, MA 01720
Cooper Energy Services, Mount Vernon, OH 43050
Ergon, Inc., P.O. Drawer 1639, Jackson, MS 39205
Failsafe Motor/Generator Protector, Marine Safe Electronics Ltd., 101 Jardin Dr., Unit 24/25, Concord, Ontario, Canada L4K 1B6
Grumman Aerospace, 111 Stewart Ave., Bethpage, NY 11714.
Indikon Corp., 26 New St., Cambridge, MA 02138
Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
Marine Safe Electronics, 37 Staffern Drive, Concord, Ontario, Canada, L4K 2X2
Maritime Protection A/S, Box 100, N-4620 Vagsbygd, Norway
Megasystems, Inc., 1075 N.W. 58th Street, Boca Raton, FL 33431
Offshore Technology Corp., 578 Enterprise St., Escondido, CA 92025
Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Praire, TX 75050
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032
Teleflex Inc., 771 First Ave., King of Prussia, PA 19406
Thomas Products, 987 West St., Southington, CT 06489-1023
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062
Valmet Automation A.S., P.O. Box 130, N-3430, Spikkestad, Norway

COUPLINGS
CamLock Flange Sales Corp./Marine Moisture Control Co., 60 Inip Dr., Inwood, N.Y 11696
SKF Steel, 201 Tower Lane, P.O. Box 745, Avon, CT 06001

CRANE BUMBERS
Kastalon Inc., 4101 West 123rd St., Alsip, IL 60658

CRANES—HOISTS—DERRICKS—WHIRLEYS
Appleton Marine, P.O. Box 2339, Appleton, WI 54913
ASEA Hagglunds Inc., P.O. Box 7949, The Woodlands TX 77380
HIAB Cranes & Loaders Inc., 258 Quigley Boulevard, New Castle, DE 19720
Machinoexport, 35 Mosfilmovskaya Ul., 117330 Moscow, U.S.S.R.
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
J.D. Neuhaus, Hebezeuge, D5810, Witten Heven, West Germany
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202

DECK MACHINERY—Cargo Handling Equipment
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, WA 98134
Murdock Engineering Company, P.O. Box 2278, Irving, TX 75061
Schoellhorn Albrecht, Div. of St. Louis Ship, 3460 So. Broadway, St. Louis, MO 63118

DECKING—GRATING
Alligned Fiber Composites, Highway 52, South Chatfield, MN 55923
International Grating, 7625 Parkhurst, Houston, TX 77028
Selby, Battersby & Company, 5220 Whiby Ave., Philadelphia, PA 19143

DIESEL ACCESSORIES—CYLINDER LINERS
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360
Haynes Corporation, P.O. Box 179, Jackson, MI 49204
Illman Jones, 1111 Green Island Rd., American Canyon, CA 94589
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Transamerica Delaval Engine & Comp. Div., 550 85th, Oakland, CA

DIESEL ENGINE—Spare Parts & Repair
Alban Engine Power, Inc., 6455 Washington Blvd., Baltimore, MD 21227
Alco Power Inc., 100 Orchard St., Auburn, N.Y. 13021
Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511
Cummins Engine Co., Inc., Mail Code 40642, Box 3005 Columbus, IN 47202-3005
Granges Repair Service GMBH, Gutenbergring, 64 D-2000 Hamburg-Norderstedt TX:0215553
Schoonmaker Service Parts Co., Inc., P.O. Box 757, Foot of Spring St., Sausalito, CA 94966
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166
Transamerica Delaval Engine & Comp. Div., 550 85th, Oakland, CA

ELECTRICAL EQUIPMENT
Stewart & Stevenson Services, Inc.—MWM, P.O. Box 1637, Houston, TX 77251-1637
Valad Electric Heating Corporation, 162 Wildey St., Tarrytown, NY 10591
Ward Leonard Electric Co., 31 South St., Mt. Vernon, NY 10550
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

ELECTRONIC SYSTEMS
Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217 TX: 125327

EMULSIFICATION SYSTEMS
Cleanodan A/S, N. American Agents, American United Marine Corp., 5 Broadway, Route 1, Saugus, MA 01906
S/S Research & Development Inc., 1050 State St., Perth Amboy, NJ 08862

ENGINE TEST EQUIPMENT
General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Road, Plymouth, MA 02360

ENTERPRISE
Transamerica Delaval Engine & comp. Div., 550 85th, Oakland, CA

EQUIPMENT—Marine
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
ASEA Hagglunds Inc., P.O. Box 7949, The Woodlands TX 77380
Band-It Division, Houdaille Industries, Inc., P.O. Box 16307, Denver, CO 80216
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Thomas Coudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
Fitz-Wright Suits Ltd., 17919 Roan Pl., Surrey, B.C., Canada V3S 5K1
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, NY 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
Raytheon Service Co., 100 Roesler Rd., Suite 103, Glen Burnie, MD
Republic-Lagun Machine Tool Co., 1000 E. Carson St., Carson, CA 90749 TX: 181098

EVAPORATORS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Aqua-Chem Inc., P.O. Box 421, Milwaukee, WI 53201
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

FANS—VENTILATORS—BLOWERS
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Gaylord Industries, Inc., P.O. Box 558, Wilsonville, OR 97070
Joy Manufacturing Company, 338 So. Broadway, New Philadelphia, OH 44663
Zidell Explorations, 3121 S.W. Moody St., Portland, OR 97201

FASTENERS
Sales Systems Limited,7006, 700 Florida Ave., Portsmouth, VA 23707

FENDERING SYSTEMS—Dock & Vessel
InterTrade Industries, 15301 Transistor Lane, Huntington Beach, CA 92649
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Samson Ocean Systems, Inc., 99 High St., Boston, MA 02110
Seaward International, Inc., 6269 Leesburg Ave., Falls Church, VA 22044

FILTERS
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307

FINANCING—Leasing
Gulf Western Leasing Corp., 1500 City West Blvd., Suite 300, Houston, TX 77047
JMJ Marine Investors, P.O. Box 51509, New Orleans, LA 70151

FIRE PROTECTION, DETECTION & ALARM SYSTEMS
Walter Kidde, Walter Kidde Dr., Wake Forest, NC 27586

FUEL OIL/ADDITIVES—Analysis & Combustion Testing
Ferrous Corporation, 910-108th N.E., P.O. Box 1764, Bellevue, WA 98009
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
McTigue Industries Inc., 1615 9th Ave., Bohemia, NY 11716
U.S. Borax, 3075 Wilshire Blvd., Los Angeles, CA 90010

FURNITURE
Bailey Carpenter & Insulation Co., 74 Sullivan Street, Brooklyn, NY 11231
Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166

GALLEY EQUIPMENT
Insinger Machine Co., 6245 State Rd., Philadelphia, PA 19135

GANGWAYS
Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960

HATCH & DECK COVERS—Chain Pipe
CamLock Flange Sales Corp./Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
MacGregor-Navire Internatinal, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016
Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

HEAT EXCHANGERS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

HOLD LINERS
Himont U.S.A., Inc., 1313 N. Market St., Wilmington, DE 19894

HULL CLEANING
Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
Gulf International Divers, P.O. Box 1342, Gretna (New Orleans), LA 70052
Pacific Maine Services, TLX: 664540 seaserv, Long Beach, CA 90802
Petroferm Marine, Route 2, Box 280, Amelia Island, FL 32034
Phosmarine Equipment, 21 Bd. de Paris, 13002, Marseille, France
Seaward Marine Services, Inc., 6269 Leesburg Pike, Falls Church, VA 22044
Seaward International, 5409 Beamon Rd., Norfolk, VA 23513 TX: 710-881-1182
Taylor Diving & Salvage Co. Inc., 701 Engineers Rd., Belle Chasse, LA 70037

HYDRAULICS
Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood, NJ 07607
Hydra-Dynamics, Inc., 2141 Greenwood Ave., Wilmette, IL 60091
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

INERT GAS—Generators—Systems
Maritime Protection A/S, N. American Agents, American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906

INSULATION—Cloth, Fiberglass
Bailey, Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
Duracote Corp., 350 North Diamond St., Ravenna, Ohio 44266
Superior Energies, Inc. P.O. Drawer 386, Groves, TX 72619

INSURANCE
Adams & Porter, 510 Bering Dr., Houston, TX 77057-1408
Adams & Porter, 1 World Trade Center, Suite 8433, New York, NY 10048
Wm. Keith Hargrove, Inc., 1300 Post Oak Blvd., Suite 2050, Houston, TX 77056
MGA International, 419 Park Avenue South, New York, NY 10016
United States P&I Agency, Inc., 80 Maiden Lane, New York, NY 10038

JOINER—Watertight Doors—Paneling
Advanced Structures Corp., 235 W. Industry Ct., Deer Park, NY 11729
Astech, 3030 S. Red Hill Ave., Santa Ana, CA 92711
Bailey Distributors, Inc., 74 Sullivan St., Brooklyn, NY 11231
Masonite Commercial Division, Dover, OH 44622
Megadoor Inc., 441 Lexington Ave., Suite 903, New York, NY 10017
Walz & Krenzer, Inc., 400 Trabold Road, Rochester, NY 14624

KEEL COOLERS
R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062

LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights
ACR Electronics, Inc., P.O. Box 2148, Hollywood, FL 33022
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Perko Inc., P.O. Box 6400D, Miami, FL 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209

LINE BLINDS
Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
A-C Brake Co., 308 E. College St., Louisville, KY
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Cunningham Marine Hydraulics Co. Inc., 2030 E. Adams St. Jacksonville, FL 32202
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Rosan, Inc., 2901 West Coast Hwy., Newport Beach, CA 92663

METALS
Bayou Steel Corp., P.O. Box 5000, Laplace, LA 70068

MINING
Rocky Mountain Energy, 10 Longspeake Dr., Box 2000, Broomfield, CO 80020

MOORING SYSTEMS
Samson Ocean Systems, Inc., 99 High Street, Boston, MA 02110

NAME PLATES—BRONZE—ALUMINUM
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Highway (Suite 1300), Arlington, VA 22202
Aero Nov Laboratories, Inc., 14-29 112 St., College Point, NY 11356
American Systems Engineering Corp., P.O. Box 4265, Virginia Beach, VA 23454

Amirikian Engineering Co., Chevy Chase Center Bldg., Suite 505, 35 Wisconsin Circle, Chevy Chase, MD 20015
Art Anderson Associates, 148 First St., Bremerton, WA 98310
B.C. Research, 3650 Wesbrook Mall, Vancouver, B.C. Canada V6S 2L2
Del Breit inc., 326 Picayune Place (Suite 201), New Orleans, LA 70130
C.A.C.I., Inc., 1815 No. Fort Myer Dr., Arlington, VA 22209
C.D.I. Marine Co., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
Phillips Cartner & Co., Inc., 203 So. Union St., Alexandria, VA 22314
Century Engineering, inc., 32 West Rd., Towson, MD 21204
Childs Engineering Corp., Box 333, Medfield, MA 02052
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, MA 02026
Crane Consultants Inc., 15301 1st Ave., So. Seattle, WA 98148
C.R. Cushing, 18 Vesey St., New York, NY 10007
Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129
Designers & Planners, Inc., 1725 Jefferson Davis Highway, Suite 700, Arlington, VA 22202
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, NY 11050
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110
The Glosten Associates, Inc., 610 Colman Bldg., 811 First Ave., Seattle, WA 98104
Phillip Gresser Associates, Ltd., 3250 South Ocean Blvd., Palm Beach, FL 33480
Morris Guralnick Associates, Inc., 620 Folsom Street, Suite 300, San Francisco, CA 94107
Hamilton Cornell Associates, Box 188, Snug Harbor Station, Duxbury, MA 02331
J.J. Henry Co., Inc., 40 Exchange Place, New York, NY 10005
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
HydroComp, Inc., 10 Cutts Road, P.O. Box 865, Durham, NH 03824
Intramarine, Inc., P.O. Box 53043, Jacksonville, FL 32201
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, MD 21227
J.L. Konopasek & Associates, 3523 Scrimshaw Dr., Jacksonville, FL 32217
James S. Krogen & Co., Inc., 3333 Rice St., Miami, FL 33133
Rodney E. Lay & Associates, 13891 Atlantic Blvd., Jacksonville, FL 32225
Alan C. McClure Associates, Inc., 2600 South Gessner, Houston, TX 77063
John J. McMullen Associates, Inc., 1 World Trade Center, New York, NY 10048
McLear & Harris, Inc., 28 West 44 Street, New York, NY 10036
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, OH 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, NY 11746
Marine Power Associates, 4475 Mission Blvd., Suite 235, San Diego, CA 92109
Marine Technical Associates, Inc., 95 River Rd., Hoboken, NJ 07030
George E. Meese, 194 Acton Rd., Annapolis, MD 21403
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
NKF Engineering Assoc., Inc., 8150 Leesburg Pile, Vienna, VA 22202
Nelson & Associates, Inc., 610 Northwest 183rd St., Miami, FL 33169
New England Engineering & Marine Services, Rt. 2, Box 50, York, ME 03909
Nickum & Spaulding Associates, Inc., 2701 First Ave., Seattle, WA 98121
Northern Marine, P.O. Box 1169, Traverse City, MI 49685
Ocean-Oil Internatinal Engineering Corporation, 3019 Mercedes Blvd., New Orleans, LA 70114
PRC Guralnick, 5252 Balboa Ave., San Diego, CA 92117
Pearlson Engineering Co., Inc., 8970 S.W. 87th Ct., Miami, FL 33156
S.L. Petchul, Inc., 1380 S.W. 57th Avenue, Fort Lauderdale, FL 33317
Q.E.D. Systems Inc., 4646 Witchduck Rd., Virginia Beach, VA 23455
M. Rosenblatt & Son, Inc., 350 Broadway, New York, NY 10013 and 667 Mission St., San Francisco, CA 94105
Schmahl and Schmahl, Inc., 1209 S.E. Third Ave., Fort Lauderdale, FL 33316
SEACOR Systems Engineering Associates Corp., 19 Perina Blvd., Cherry Hill, NJ 08003 (Publications Division at Cherry Hill location)
STV/Sanders & Thomas, Inc., 1745 Jefferson Davis Hwy., Arlington, VA 22202
Seaworthy Systems, Inc., 28 Main St., Essex Ct. 06426; 17 Battery Place, N.Y. N.Y. 10004, P.O. Box 205, Solomons, MD 20688
Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004
George G. Sharp, Inc., 100 Church St., New York, NY 10007
Simmons Associates, P.O. Box 760, Sarasota, FL 33578
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235
J.F. Stroschein Associates, 666 Old Country Rd., Garden City, NY 11530
Richard R. Taubler, Inc., 610 Carriage La., Dover, DE 19901
Timsco, 622 Azalea Road, Mobile, AL 36609
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744

NAVIGATION & COMMUNICATIONS EQUIPMENT

Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
British Telecom International, The Holborn Centre, 120 Holborn, London EC1N 2TE
CMC Communications Inc., 5479 Jetport Industrial Blvd., Tampa, FL 33614
COMSAT World Systems, 950 L'Enfant Plaza, S.W., Suite 6151 Washington, DC 20024
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
General Electric Company, Mobile Communications Division, Lynchburg, VA 24502
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel Corp., 9 Hoyt Drive, Newburyport, MA 01950
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
ITT Mackay, 441 U.S. Highway #1, Elizabeth, NJ 07202
Japan Radio Co., Ltd., Akasaka Twin Tower, 17-22, Akasaka 2-chome, Minato-ku, Tokyo 107, Japan U.S. Rep: 405 Park Ave., New York, NY 10022
Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
Kongsberg Vopenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Krupp Atlas-Elektronik, 1453 Pinewood St., Rahway, NJ 07065
Micrologic, 20801 Dearborn, Chatsworth, CA 91311
Nov-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
Navigation Sciences Inc., 6900 Wisconsin Ave., Bethesda, MD 20815 TX: 705999
Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164
Racal Marine Inc., 1 Commerce Blvd., Palm Coast, FL 32037-0029
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Co., 676 Island Pond Road, Manchester, NH 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Robertson Autopilot, 400 Oser Ave., Happauge, NY 11738
Simrad, Inc., 2208 N.W. Market St., Suite 600, Seattle, WA 98107
Sperry Corporation, Great Neck, NY 11020
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Telesystems, 2700 Prosperity Ave., Fairfax, VA 22031 USA
Texas Instruments, Inc., P.O. Box 405, 3438, Lewisville, TX 75067

OILS—Marine—Additives

Exxon Company, U.S.A., Room 2323 AH, P.O. Box 2180, Houston, TX 77701
Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil, New York District Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601
Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
Texaco, Inc. (International Marine), 135 East 42nd St., New York, NY 10017

OIL/WATER SEPARATORS

Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Biospherics Incorporated, 5001 Forbes Blvd., Lanham, MD 20801
Butterworth Inc. (USA), 3721 Lapas Dr., P.O. Box 18312, Houston, TX 77223-9989
Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale, NJ 07647
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
Hyde Products, Inc., 810 Sharon Dr., Westlake, OH 44148
Microphor, Inc., P.O. Box 490, Willits, CA 95490
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
Peck Purifier Sales Co., 3724 Cook Blvd., Chesapeake, VA 23323

PAINTS—COATINGS—CORROSION CONTROL

American Abrasive Metals, 460 Coit Street, Irvington, NJ 07111
Ameron, 4700 Ramona Blvd., Monterey Park, CA 91754
A.W. Chesterton Co., Middlesex Industrial Park, Rt. 93, Stoneham, MA 02180
Chugoku Marine Paints (U.S.A.) Inc., 1290 Ave. of Americas, New York, NY 10104
CLEMCO, P.O. Box 7680, San Francisco, CA 94120
"CONSOL" manufactured by Contact Paint & Chemical Co. Inc., 200 S. Franklintown Rd., Baltimore, MD 21223
Dampney Company, Inc., 85 Paris St., Everett, MA 02149
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
Drew Ameroid Marine, One Drew Chemical Plaza, Boonton, NJ 07005
E.I. DuPont De Nemours & Co., Inc. Nemours Bldg., Rm. N-2504-2, Wilmington, DE 19898
DuPont Co. MPS , Room X40750, Wilmington, DE 19898
Eureka Chemical Company, 234 Lawrence Avenue, So. San Francisco, CA 94080
Farboil Company, 8200 Fischer Rd., Baltimore, MD 21222
Glidden Coatings & Resins, Architectural & Maintenance, 925 Euclid Ave., Cleveland, OH 44115
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057; 6868 NorthLoop East, Suite 304, Houston, TX 77028; P.O. Box 10265, New Orleans, LA 70181
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jotun Marine Coatings Inc., 840 Key Hwy., Baltimore, MD 21230
Magnus Maritec International Inc., 150 Roosevelt Pl., P.O. Box 150, Palisades Park, NJ 07650
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Palmer Products Inc., P.O. Box 8, Worcester, PA 19490
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203
Sermatech International, 4401 SermeTel Dr., Moss Point, MS 39563

PIPE-HOSE—Cargo Transfer Clamps, Couplings, Coatings

Amermarine International, P.O. Box 9205, Dundalk, MD 21222
Deutsch Metal Components, 14800 S. Figueroa St., Gardena, CA 90248
Hydro-Craft Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Selkirk Metalbestos, Box 19000, Greensboro, NC 27419
Tioga Pipe Supply Co. Inc., 2450 Wheatsheaf La., P.O. Box 5997, Philadelphia, PA 19137

PLASTICS—Marine Applications

Hubeva Marine Plastic, Inc., 390 Hamilton Ave., Brooklyn, NY 11231
Norton Chemplast, 309-150 Dey Rd. Wayne NJ 07470

PLYWOOD

Simpson Timber Co., Third and Franklin, Sheton, WA 98584

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines

Amarillo Gear Co., P.O. Box 1789, Amarillo, Texas 79105
Aquamaster Inc., 4125, 9th Avenue N.W. Seattle, WA 98107
Armco Steel/Advanced Materials Div., 703 Curtis St., Middletown, OH 45043
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bergen Diesel Inc., 2110-10 Service Rd., Kenner, LA 70062
Bird-Johnson Company, 110 Norfolk St., Walpole, MA 02081
Boston Metals Co., 313 E. Baltimore St., Baltimore, MD 21202
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
Capitol Gears, 349 N. Hamline Ave., St. Paul, MN 55104
Caterpillar Engine Division, 100 N.E. Adams, Peoria, IL 61629
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
Combustion Engineering, Inc., Windsor, CT 06095
Coolidge-Stone Vickers, Inc., 56 Squirrel Rd., Auburn Hills, MI 48057
Daihatsu Diesel (USA) Inc., 180 Adams Ave., Hauppauge, NY 11788
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
George Engine Company, Inc., Lafayette, LA
General Motors, Electro-Motive Division, LaGrange, IL 60525
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
Isotta Fraschini S.p.A., c/o Italian Aerospace Industries (U.S.A.), Inc., 1235 Jefferson Davis Hwy., Suite 500, Arlington, VA 22202
KHD Canada Inc., 180 Rue de Normandie, Boucherville, Quebec J4B 5S7, Canada
KaMeWa, P.O. Box 1010, S-68101, Kristinehamn, Sweden
KaMeWa, 1717 E. Loop, Suite 465, Houston, TX 77027
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
M.A.N.-B&W Diesel, 2 Ostervej, DK-4960 Holeby, Denmark
MTU of North America, One E. Putnam Ave., Greenwich, CT 06830; 10450 Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City, LA 70203; 180 Nickerson St., Seattle, WA 98109; 1730 Lynn St., Arlington, VA 22209
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Mapeco Products, Inc., 20 Vesey St., New York, NY 10007
Maritime Industries Ltd., 6307 Laurel St., Burnaby, B.C., Canada V5B 3B3
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
North American Marine Jet P.O Box 1232 Benton, AR 72015
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Penske GM Power, Inc., 600 Parsippany Road, Parsippany, NJ 07054
Penske GM Power, Lodi N.J., 180 Rt. 17 South, Lodi, NJ 07644
Inland Water Propulsion Systems, Inc., 580 Walnut St., Cincinnati, OH 45201
Propulsion Systems, Inc., 21213 76 Ave. So., Kent, WA 98032
SACM (Societe Alsacienne De Constructions Mechaniques De Mulhouse) 1, Rue De La Fonderie, Boite Postale 1210, 68054 Mulhouse Cedex, France
Schottel of America, Inc., 8375 N.W. 56 St., Miami, FL 33166
Stewart & Stevenson Services, Inc., P.O. Box 1637, Houston, TX 77251-1637
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Tech Development Inc., 6800 Poe Ave., P.O. Box 14557, Dayton, OH 45414
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, NJ 08650
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
Voith Schneider America, 159 Great Neck Rd., Ste. 200, Great Neck, NY 11021
Volvo Penta of America, P.O. Box 927, Rockleigh, NJ 07647
WABCO Fluid Power, an American-Standard Company, 1953 Mercer Rd., Lexington, KY 40505
Wartsila Power Inc., 5132 Taravella Rd., P.O. Box 868, Marrero, LA 70072
Waukesha Engine Division, Waukesha, WI 53187

PUMPS—Repairs—Drives

Allweiler Pump Inc., 5410 Newport Dr., Rolling Meadows, IL 60008 TX: 270-0444
Cunningham Marine Hydraulics Co., Inc., 201 Harrison St., Hoboken, NJ 07030; 2030 E. Adams St., Jacksonville, FL 32204, TX: 710-730-5224
CMH Heleshaw, Inc., 201 Harrison St. Hoboken N.J. 07030
Goltens, 160 Van Brunt St., Brooklyn, NY 11231
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
Ingersoll—Rand Pump Group, Dept. B—346, Washington, N.J. 07882
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Sims Pump Valve Co., Inc., 1314 Park Ave., Hoboken, NJ 07030
Transamerica Delaval, Pyramid Pump Div., P.O. Box 447, Monroe, NC 28110
Vita Motivator Company, 200 West 20th St., New York, NY 10011
Warren Pumps Division, Bridges Avenue, Warren, MA 01083
Wilden Pump & Engineering Co., 22060 Van Buren St., P.O. Box 845, Colton, CA 92324

REFRIGERATION—Refrigerant Valves

Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, NY 11231
United Technologies Carrier Transicold Div., Carrier Corp., P.O. Box 4805, Syracuse, NY 13221

ROPE—Manila—Nylon—Hawsers—Fibers

A.L. Don Co., Foot of Dock St., Matawan, NJ 07747
Allied Fibers, 1411 Broadway, New York, NY 10018
American Mfg. Co., Inc., Willow Avenue, Honesdale, PA 18431
Atlantic Cordage Corp., 60 Grant Avenue, Carteret, NJ 07008
DuPont Co., KEVLAR Aramid Fiber, Room G-15465, Wilmington, DE 19898
Samson Ocean Systems, Inc., 99 High Street, Boston, MA 02110
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
Tubbs Cordage Co., P.O. Box 7986, San Francisco, CA 94120-7986
Vermeire N.V. Industripark Zwaarveld, B-9160 Hamme, Belgium TX: 21687
Wall Industries, Inc., P.O. Box 560, Elkin, NC 28621

SANITATION DEVICES—Pollution Control

Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
FAST Sewage Systems, Div. of St. Louis Ship, 611 East Marceau St., St. Louis, MO 63111
Golar Metal A/S, P.O. Box 70, 4901 Tvedestrand, Norway
Hamworthy Engineering Ltd., 10555 Lake Forest Blvd., Suite 5F, New Orleans, LA 70127
Marine Moisture Control Co., Inc., 60 Inip Dr., Inwood, L.I., NY 11696
Marland Environmental Systems, P.O. Box 501, Great Falls, VA 22066
National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105

SCAFFOLDING EQUIPMENT—Work Platforms

McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238
Trus-Joist Corp., P.O. Box 60, Boise, ID 83704

SCUTTLES/MANHOLES

Mock Manufacturing Inc., 777 Rutland Rd., Brooklyn, NY 11203

SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT

Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081
Crane Packing Company, 435 Regina Dr., Clarksberg, MD 20734
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470

SHIPBREAKING—Salvage

Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland, OR 97217
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, OR 97201

SHIPBUILDING EQUIPMENT

Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA. 93116
Cockatoo Dockyard Pty. Ltd., P.O. Box 1139, North Sydney, NSW 2060, Australia TX: 72086
Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156
Total Transportation System Inc., 813 Forest Dr., Newport News, VA 23606
Total Transportation Systems (International) A/S, Bjornegarden, P.O. Box 248, N 5201, Os, Norway

SHIPBUILDING STEEL

Armco Steel Corp., 703 Curtis St., Middletown, OH 45042
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
United States Steel Corp., Christy Park Plant, 2214 Walnut St., McKeesport, PA 15132
Welded Beam Company, P.O. Box 280, Perry, OH 44081

SHIPBUILDING—Repairs, Maintenance, Drydocking
Amsterdam Drydock Company, Post Box 3006, 1003 AA, Amsterdam, Holland
Arsenale Triestino-San Marco Shipyard, Trieste, Italy, U.S. Rep: Marine Technologies & Brokerage, 33 Rector St., New York, NY 10066
Asmar Shipyards Co., Astilleros y Maestranzs de la Armada, Prat 856, Piso 14, Casilla 150-V, Valpariso, Chile, S.A.
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, LA 70150
Bardex Hydranautics, 6338 Lindmar Dr., P.O. Box 1068, Goleta, CA 93116
Bath Iron Works Corp., 700 Washington St., Bath, ME 04530
Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
Blohm & Voss AG, P.O. Box 100720, D-2000 Hamburg 1 (In US)-Blohm & Voss CO, Springfield, N.J.
Boston Whaler Commercial Div., 1149 Hingham St., Rockland MA 02370
Burrard Yarrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada
Cantieri Navali Riuniti, Via Cipro, 11, 16100 Geneva, Italy
Chesapeake Shipbuilding Inc., 710 Fitzwater St., Salisbury, MD 21801
Conrad Industries, P.O. Box 790, Morgan City, LA 70380
Curacao Drydock Company Inc., 26 Broadway, Suite 741, New York, NY 10040
Dorbyl Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London, Republic of South Africa
Dubai Drydocks, P.O. Box 8988, Dubai, United Arab Emirates—U.S.A. Agents: Keppel Marine Agencies, Inc., 26 Broadway, New York, NY 10040, 6240 Richmond Ave., Houston, TX 77057
Eastern Marine, Inc., P.O. Box 1009, Panama City, FL 32401
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, OR 97208
Genstar Marine, 10 Pemberton Ave., No. Vancouver, B.C., Canada V7P 2R1
Gladding-Hearn Shipbuilding Corp., 1 Riverside Ave., Somerset, MA 02725
Golten Marine Co., Inc., 60 Van Brunt St., Brooklyn, NY 11231
HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219
Halter Marine, Inc., P.O. Box 29266, New Orleans, LA 70189
Hitachi Zosen Corp., 1-1-1 Hitotsubashi, Chiyoda-ku, Tokyo 100, Japan
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong
Hyundi Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, Korea
Jakobson Shipyard Inc., P.O. Box 329, Oyster Bay, NY 11771
Jeffboat Inc., Jeffersonville, Ind. 47130
Jered Brown Brothers, Inc., 56 S. Squirrel Rd., Auburn Hills, MI 48057
Keppel Shipyard Limited, 325 Telok Blangah Road, P.O. Box 2169, Singapore 0409
Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego, LA 70094
Kone Corp. P.O. Box 6 SF-05801 Hyvinkaa, Finland
Paul Lindenau GmbH, & Co., Schiffswerft u. Maschinenfabrik, D-2300 Kiel-Friedrichsort, West Germany
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, WA 98134
M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany
Main Iron Works, Inc., P.O. box 1918, Houma, LA 70361
Marinette Maine Corporation, Marinette, WI 54143
Mitsubishi Heavy Industries, Ltd., 5-1, Marunochi 2-chome, Chiyoda-ku, Toyko, 100 Japan
MonArk Boat Co., P.O. Box 210, Monticello, AR 71655
Moran Shipping Agencies, 602 Sawyer, Suite 200, Houston, TX 77077
Moss Point Marine Inc., P.O. Box 1310, Escatawpa, MS 39552
Nashville Bridge Company, P.O. Box 239, Nashville, TN 37202
National Marine Service (Shipyard Division), P.O. Box 38, Hartford, IL 62048
National Steel & Shipbuilding Corp., San Diego, CA 92112
Nautilus Surveys Inc., 10822 Sageleaf Lane, Houston, TX 77089
Neorion Shipyards Syros Ltd., Syros, Greece–U.S.A. Agents: Keppel Marine Agencies Inc., 26 Broadway, New York, NY 10004, 6420 Richmond Ave., Houston, TX 77057
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607
Nichols Brothers Boat Builders Inc., P.O. Box 580, 5400 S. Cameron Rd., Freeland, WA 98249
Pennsylvania Shipbuilding, P.O. Box 442, Chester, PA 19016
Promet (PTE) Ltd., 27 Pandam Rd., Jurong Industrial Estate, Singapore 22
Promet Marine Services Corp., 242 Allens Ave., Providence, RI 02905
Rauma-Repola, 26100 Rauma 10, Finland
Samsung Shipbuilding & Heavy Industries Co., Ltd., Samsung Main Bldg. 250, 2Ka, Taepyong-ro, Chung-ku, Seoul, Korea
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Southwest Marine, Inc., P.O. Box 13308, San Diego, CA 92113
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Thomas Marine, 37 Bransford St., Patchogue, NY 11772
Todd Shipyards Corp., 1 State St. Plaza, New York, NY 10004
Tracor Marine, P.O. Box 13107, Port Everglades, FL 33316
Vanguard Services, P.O. Drawer A, New Johnsonville, TN 37134
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Parker Hannifin Corp. Rotary Actuator Div., 9948 Rittman Rd., Wadsworth, OH 44281
Pittsburgh Brass Manufacturing, Sandy Hill Rd., R.D. 6 Box 387-A, Irwin, PA 15642
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Stacey/Fetterolf Corporation, P.O. Box 103, Skippack, PA 19474
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Whitey Co., 318 Bishop Road, Highland Heights, OH 44143
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Nashville Bridge Co., P.O. Box 239 Nashville TN 37202
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Smith Berger Marine Inc., 516 S. Chicago St., Seattle, WA 98108

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Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055
Seacoast Electric Supply Corp., 1505 Oliver St., Houston, TX 77007

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WIRE ROPE—Slings
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Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
A.L. Don Company, Foot of Dock Street, Matawan, NJ 07747
I & I Sling Company, 2626 Market Street, Dept. D, Aston, PA 19014

ZINC
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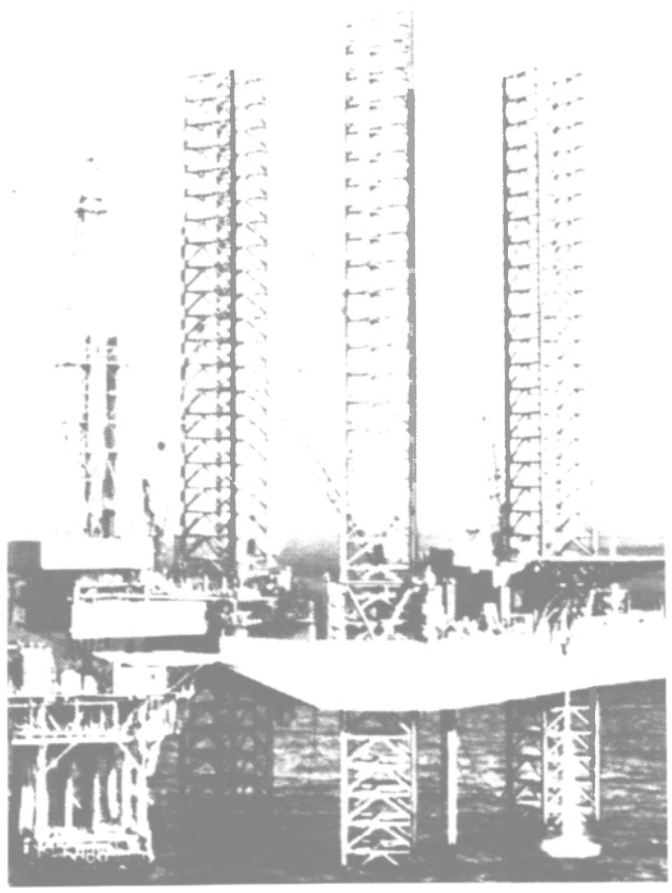

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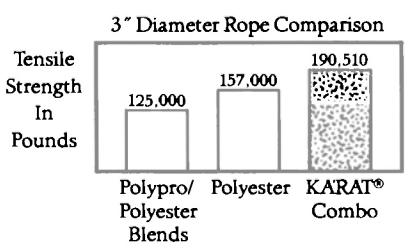

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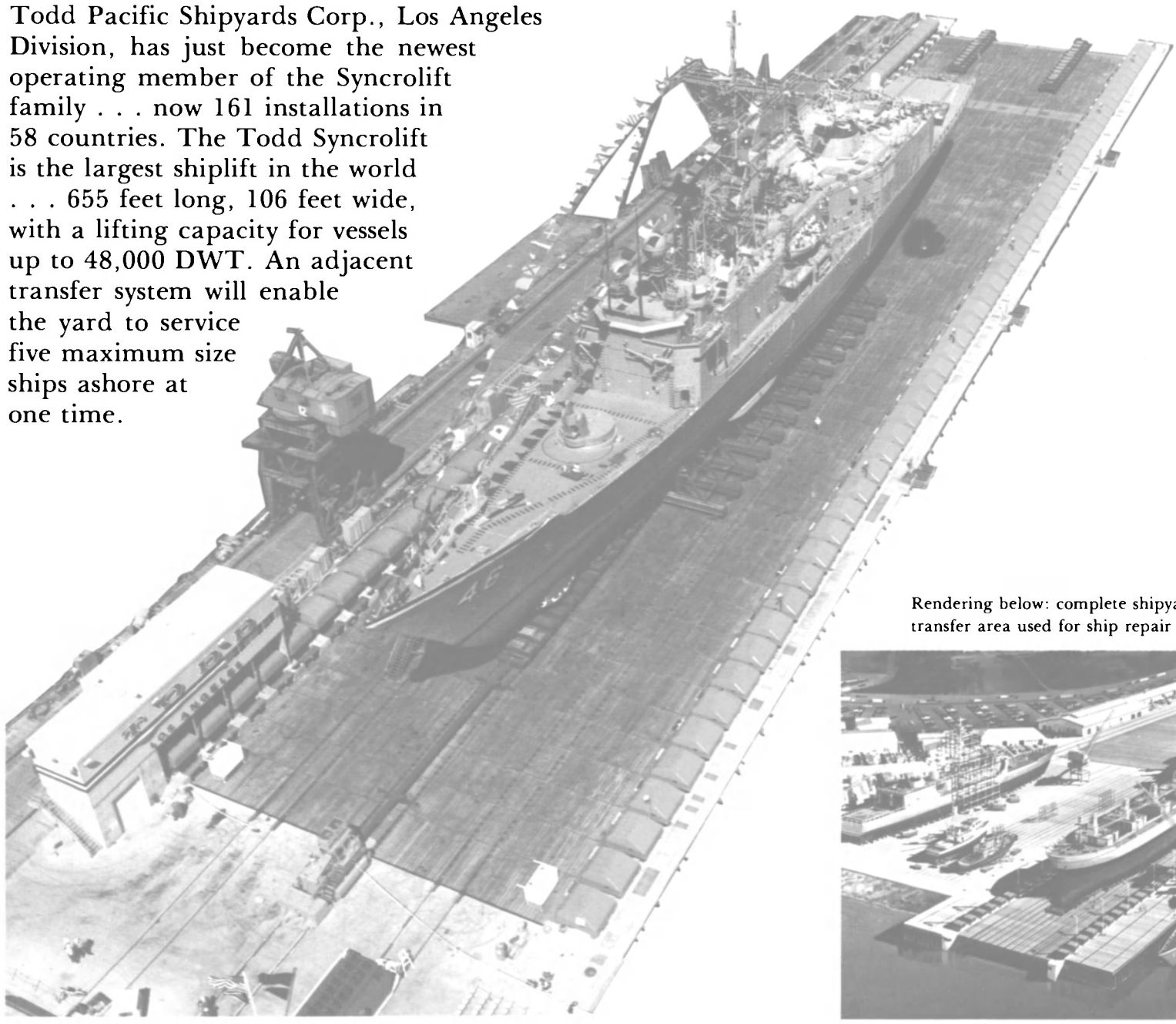

Photograph above taken March 27, 1984, at Inauguration Ceremony.
Photo by Joseph Ernest, Todd Pacific Shipyard.

Rendering below: complete shipyard project including transfer area used for ship repair or new construction.

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