MARITIME
REPORTER
AND
ENGINEERING NEWS

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NATIONAL MARITIME SHOW

Rowan Gorilla I

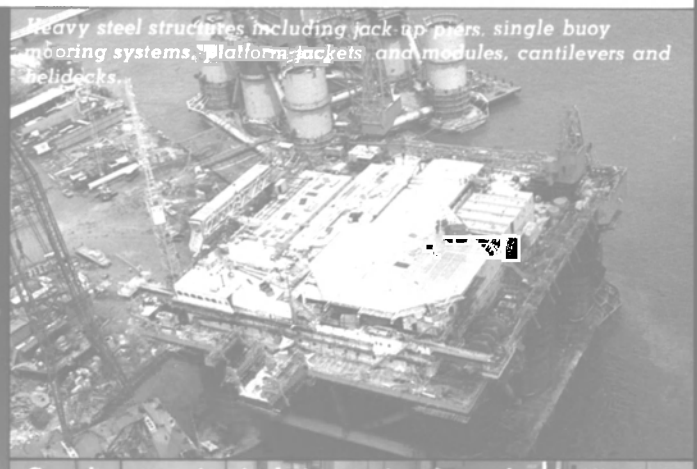
Marathon-Built
Rowan Gorilla I
(SEE PAGE 4)

APRIL 1, 1984

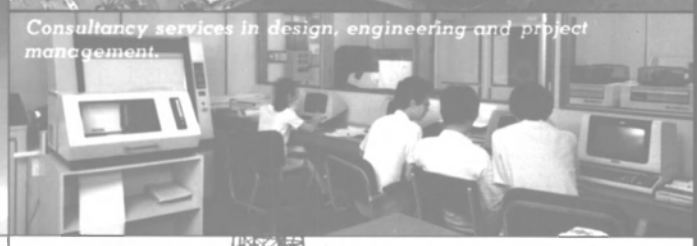
WHATEVER YOUR OFFSHORE NEEDS, FELS HAS THE ANSWER AND THE EXPERTISE

Yes, we have the answer and the expertise.
For fifteen years, we have satisfied the offshore needs of our customers worldwide. Our international engineering and construction expertise and experience include the construction of the complete range of mobile offshore drilling rigs, various offshore related and supporting equipment, conventional and specialised vessels, and other heavy steel structures, both onshore and offshore.
We also provide consultancy services in design, engineering and project management.

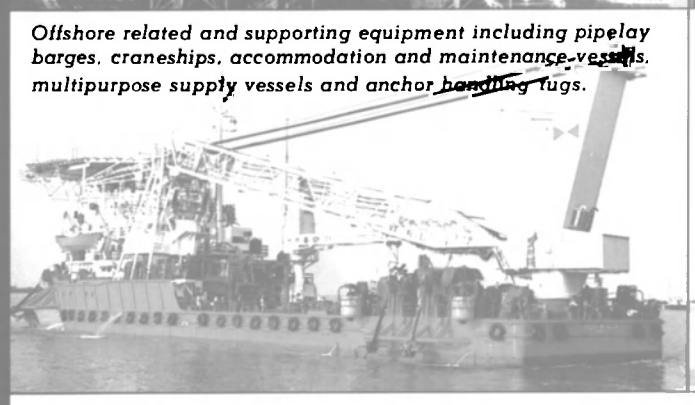
Mobile offshore drilling rigs comprising semi-submersibles, jack-ups, drillships, drilling tenders, drill barges and submersibles.



Heavy steel structures including jack-up piers, single buoy mooring systems, platform jackets and modules, cantilevers and helidecks.



Consultancy services in design, engineering and project management.



Offshore related and supporting equipment including pipelay barges, craneships, accommodation and maintenance vessels, multipurpose supply vessels and anchor handling tugs.

Conventional and [illegible] vessels including tin dredges, bulk carriers, cargo/cont[illegible] liquid-carrying vessels, roll-on/roll-off vessels and [illegible]

WHAT ARE YOUR OFFSHORE NEEDS?

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FELS

"Happy centennial, Brooklyn Bridge," from the McAllister Brothers.

The Brooklyn Bridge was completed in 1883 and is celebrating its 100 year centennial this year.
McAllister Brothers was established in 1864. We are proud that our barges played an important role in the building of this bridge.

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Circle 105 on Reader Service Card

ON THE COVER

Ames And O'Donnell Named Regional Directors For Maritime Administration

Maritime Administrator **H.E. Shear** has announced the appointment of **Alpha H. Ames Jr.** as director of the MarAd Great Lakes Region and **Francis J. O'Donnell** as director of the Eastern Region. Each has been serving in an acting capacity.

Mr. **Ames** succeeds **George Ryan,** who resigned from the agency in 1982 to become president of the Lake Carriers Association in Cleveland. As regional director, Mr. **Ames** is responsible for assisting U.S.-flag ocean operators and Great Lakes port interests in their marketing efforts and in supporting other maritime endeavors. The region embraces all of Ohio, Michigan, Indiana, Illinois, Wisconsin and Minnesota, and parts of New York and Pennsylvania. The region office, opened in Cleveland in 1975, was moved to Des Plaines, Ill., in 1983.

Mr. **O'Donnell,** headquartered in New York City, administers federal programs that assist the American maritime industry in all or parts of 17 states stretching from Maine to Florida, and Puerto Rico and the Virgin Islands.

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Editorial and Executive Offices
107 East 31st Street, New York, N.Y. 10016
(212) 689-3266 • ITT Telex: 424768 MARINTI

PUBLISHERS	John E. O'Malley Charles P. O'Malley
EDITORIAL DIRECTOR	Charles P. O'Malley
EDITOR	Robert Ware
SENIOR EDITOR	Thomas H. Phillips
ASSOCIATE EDITOR	Kathleen Reagan
EDITORIAL COORDINATOR	Lilian Irvine
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ADVERTISING SALES MANAGER	Linda Niepokoj
PRODUCTION MANAGER	Katherine St. Onge
ART DIRECTOR	Ellen Hemmer
CIRCULATION MANAGER	M. Sottile

SALES OFFICES

New York, New York
Maritime Reporter & Engineering News
107 East 31st Street, New York, NY 10016
Telephone: (212) 689-3266

Houston, Texas
Robert Hawley
Gary Lindenberger
Mike Sullivan
11777 Katy Freeway, Suite 155, Houston, TX 77079
Telephone: (713) 870-0470

Italy
Mr. Vittorio F. Negrone
Ediconsult Internazionale
Piazza Fontane Marose, 3-16123 Genova, Italy
Telex: 211197 EDINT I
Telephone: (010) 543.659-268.334-268.513

Scandinavia
Mr. Stephan R G Orn
Ab Stephan R G Orn
Box 184, S-271 00 Ystad, Sweden
Telex: 33335 ORN S, Telephone: 0411-184 00

West Germany
Wolf O. Storck
Schiffahrtswerbung Karl-Otto Storck
Stahlwiete 7, 2000 Hamburg 50,
Federal Republic of Germany
Telephone:040/850 0071

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ALL MATERIAL FOR EDITORIAL CONSIDERATION SHOULD BE ADDRESSED TO ROBERT WARE, EDITOR.

Electric Boat Awarded $22½-Million Increase To Previous Navy Contract

General Dynamics Incorporated, Electric Boat Division, Groton, Conn., has been awarded a $22,571,218 face value increase to a previously awarded cost-plus-fixed-fee Navy contract for naval architectural and marine engineering support and acquisition of prototype systems and subsystems under the improved performance machinery program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

Saint John Shipbuilding Upgrades Its CAD/CAM For Big Frigate Program

Saint John Shipbuilding & Dry Dock Company, Ltd., in New Brunswick, Canada, has chosen AUTOKON and AUTOFIT as its CAD/CAM systems for carrying out the big Canadian Navy Frigate Program contract. The Saint John yard has been awarded prime contractor responsibility for the detailed design, procurement, and management of the entire program, including construction of three of the first six vessels in the series.

The system supplier, Shipping Research Services, will start delivery of the CAD/CAM software shortly. It will be used for detailed design, material takeoff, generation of design and production drawings, and N/C control tapes for steel cutting and pipe bending. The software will be operated on Prime computers and use different brands of graphical work stations. The installation will be a major one.

Saint John Shipbuilding has been an AUTOKON user for a decade; the contract implies upgrading to the newest generation of AUTOKON, while it is SRS' first installation of the AUTOFIT piping engineering system in North America.

For more information on the AUTOKON and AUTOFIT systems,

Circle 97 on Reader Service Card

Marine Society Annual Dinner Scheduled For April 9 At Plaza Hotel

The Marine Society of the City of New York will hold its 214th consecutive Annual Dinner on Monday, April 9, at the Plaza Hotel in New York City. Capt. **R.N. LePage,** president of the Society, has announced that Capt. **Warren G. Leback,** deputy maritime administrator at the Maritime Administration, will be the honored guest and speaker. Captain **Leback,** a member of the Marine Society for more than 25 years, has served with distinction in the commercial sector both at sea and ashore before entering government service.

The dinner will be in the Grand Ballroom following a reception from 6:30 to 7:30. Reservations may be made by contacting Capt. **Conrad Nilsen,** dinner chairman, at (201) 338-4137, or Ms. **Mills** at the Marine Society office, (212) 425-0448.

New Beemer Engineering Catalog Describes Its Flexible K-Couplings

Beemer Engineering Company of Fort Washington, Pa., offers a new catalog that provides complete engineering and application data on Flexible polyurethane elastomeric K-Couplings that will operate at up to 3/16-inch parallel and 15-degree angular misalignment.

The couplings and their applications are thoroughly described, and both photographs and dimensional drawings are provided. Also included are charts outlining part numbers, sizes and capacities, horsepower and torque, and torque capacity versus hours of life.

For a free copy of the new Beemer catalog,

Circle 10 on Reader Service Card

Transamerica Delaval Ends Its Technical Assistance Agreement With IMO AB

Transamerica Delaval Inc. has dissolved its joint technical assistance agreement with IMO AB of Stockholm, Sweden. Henceforth the name of the division will be the Pyramid™ Pump Division of Transamerica Delaval Inc., and the registered trademark IMO will no longer be used to describe the division, or any of its pumps or other products.

J. Kenneth Lippincott, general manager, stated that the action will have no impact on existing business arrangements, division management, or location of facilities. Pyramid Pump plants are situated in Monroe, N.C., and Columbia, Ky.

Pyramid Pump Division will continue to offer the same lines of positive displacement pumps that have made Transamerica Delaval an industry leader during the past 51 years. These include:

(1) Three-screw pumps used worldwide in industrial and naval applications—known for simple design, smooth flow, high shaft speed capability, and very low noise level.

(2) Geared twin-screw (GTS®) pumps used in petroleum and process installations afloat and ashore—providing very high capacities, great resistance to dirt, and, when used for stripping, has the ability to run dry without damage.

(3) Crescent internal gear (CIG®) pumps that find wide application in fluid power systems; these have high pressure capabilities and the ability to handle high water base fluids.

Mr. **Lippencott** emphasized the fact that Pyramid Pump Division will offer the same quality product lines, repair parts, and service support that it has offered since 1933 under the IMO name. Pyramid Pump will continue to build on its 51-year record of engineering and design expertise, operating efficiency, and proven reliability, he said.

Transamerica Delaval has 19 operating divisions at 22 manufacturing locations worldwide. The company makes a line of industrial products including compressors, connectors, controls, diesel engines, electric motors, fasteners, filters, forgings, gearing, pumps, sensors, steam condensers, turbines, valves, and waste treatment systems.

Circle 26 on Reader Service Card

Griffith Named Vice President-Marine Operations For TOTE

Richard W. Griffith

Richard W. Griffith has been elected vice president of marine operations for Totem Ocean Trailer Express, Inc. (TOTE), Seattle. The announcement was made by TOTE president **Robert B. McMillen.**

Mr. **Griffith** has been with TOTE since 1977 as marine manager. Previously, he was a marine engineer for Sun Shipbuilding in Chester, Pa.

TOTE is a privately owned Alaska corporation providing cargo transportation between that state and the lower 48 using two roll-on/roll-off trailerships, the Great Land and Westward Venture. It operates out of the Port of Tacoma and the Port of Anchorage.

Navy Awards Sperry $50-Million Increase To Computer Contract

Sperry Corporation, Computer Systems, St. Paul, Minn., has been awarded a $50,433,760 face value increase to a previously awarded firm-fixed-price Navy contract for 520 AN/UYK-20 and AN/UYK-20A standard computers. The Naval Sea Systems Command is the contracting activity.

Bestobell Mobrey Promotes Houba And Bowerman To Sales Executive Posts

Bestobell Mobrey, headquartered in Slough, Berkshire, England, part of the worldwide Bestobell group that specializes in component technologies, recently re-organized its export sales operations. The main changes involved locating regional executives in Europe and Southeast Asia to provide greater service to customers and assistance to overseas agents and associate companies.

J. Houba

D. Bowerman

Based in Liege, Belgium, **J. Houba** has taken up the post of European regional export manager, having worked for the company for six years as marketing and commercial manager for Belgium and France. His main area of responsibility is to assist the five Mobrey European companies or agents, and to coordinate major international projects originating in Western Europe.

In Southeast Asia, **D. Bowerman** has been appointed regional export executive, with responsibilities similar to those of Mr. **Houba**. Mr. **Bowerman** is based in the well-established office of Bestobell Singapore Pty., and covers the Asian territories including Japan, Korea, and several other Far Eastern regions. He has worked for Mobrey for 10 years in sales positions in both U.K. and export operations.

Other Mobrey export sales regions remain the responsibility of Slough-based executives, who regularly visit their individual territories.

50-Page Manual On Marine Fenders Offered By Seaward International

Seaward International, Inc. of Falls Church, Va., has just published a 50-page technical manual on its Sea Guard® line of marine fenders. The new catalog provides complete technical data and specifications for the standard Sea Guard fender sizes. In addition to describing the many advantages and applications of these fenders, the manual outlines the construction features, fender system design, size selection criteria, and installation guidelines.

Sea Guard fenders are 100-percent foam-filled, have a smooth exterior surface, and are adaptable to many types of installation requirements including harbor, offshore, and ship-to-ship applications. These fenders are highly portable and can be installed in a number of ways, such as fixed on a dock face or floating. The booklet contains numerous photographs and drawings illustrating fender installation examples and arrangements.

For a free copy of the Sea Guard manual,

Circle 41 on Reader Service Card

Tokyo Marine Services Is Active Worldwide — Color Brochure Available

Tokyo Marine Services Ltd., operator of eight oceangoing tugs and four 400-foot, semi-submersible barges, announces a status report on four major projects now under way or recently completed.

The 12,000-bhp tug Dahlia has the semi-submersible rig Penrod 74 under tow en route from the Philippines to the U.S. Gulf. Sailing at the end of December 1983, the rig is scheduled for delivery in April this year.

In another move, the J-deck module for Pecten (Shell) was constructed aboard the 14,700-dwt barge TMS-6 in Morgan City, La. The tug Kaiyo Maru then took the barge under tow from the Gulf en route to Duala, where installation of the central platform in the Mokoko and Abana fields off Cameroon took place in February.

Under contract to Brown & Root, TMS has delivered four barges with modules and other structures from NKK's Shimizu yard to the Sabah gas utilization project off Labuan Island, North Borneo. The barges were towed by the tugs Freejia, Shin-ei Maru, Kairyu Maru, and Tokuei Maru No. 28.

Finally, the TMS tug Amaryllis and 400-foot barge TMS-5 loaded a deck cargo of nine harbor tugs built by Tsuneishi Shipbuilding in Japan for delivery to Buenes Aires.

For more information on Tokyo Marine Services and a free 16-page, full-color brochure,

Circle 93 on Reader Service Card

Ingalls Gets $14½-Million For Navy LHD-1 Long Lead Time Material

Litton Systems Incorporated, Ingalls Shipbuilding division, Pascagoula, Miss., has been awarded a $14,475,212 face value increase to a previously awarded cost-plus-fixed-fee Navy contract for long lead time material for the LHD-1 multi-purpose amphibious assault ship, including jigs and fixtures, fuel pumps and purifiers, and miscellaneous raw materials. The Naval Sea Systems Command is the contracting activity.

Richard Faber Promoted To Marine/Military Sales Manager At Aeroquip

Rick Faber

Richard Faber has been promoted to marine/military sales manager in Aeroquip Corporation's Industrial Division marketing department, based in Jackson, Mich.

Mr. **Faber** has more than nine years of Aeroquip sales experience. He was formerly an account executive in the Industrial Division's farm/construction core account marketing group based in Normal, Ill. He is a graduate of Youngstown State University.

Aeroquip Corporation is a subsidiary of Libbey-Owens-Ford Company. A worldwide leading manufacturer of fluid power and fluid system components, Aeroquip's diversified product lines include flexible hose, fittings, and assemblies; quick-disconnect, V-band, and mechanical pipe couplings and accessories; hydraulic and pneumatic cylinders; ball, rotary, and swivel joints; custom-engineered rubber products, spring brakes; cargo control equipment; refrigeration/air-conditioning components; railroad products; and aerospace components.

Service Machine Group Building Offshore Units For Five Oil Companies

Service Machine Group, Inc. of Morgan City, La., has been awarded five contracts for the fabrication of jackets, a deck, and platforms or offshore rigs as follows:

For Chevron, a four-pile jacket that will be installed in 184 feet of water in West Cameron Block 541, with delivery in June 1984;

An eight-pile jacket for Shell Offshore, to be installed in 88 feet of water in Grand Isle Block 33-A, July 1984 delivery;

A four-pile deck to be installed in High Island Block A515-A for Tenneco, June 1984 delivery;

For Pennzoil, a four-pile platform for 212 feet of water in West Cameron Block 587 B., delivery April 1984; and

An eight-pile platform for Mobil to be installed in 324 feet of water in West Cameron 618A, with delivery in November 1984.

PEPCON Offers New Brochure On Marine Organism Control

"Marine Organism Control for Seawater Supply Systems" is the title of a new four-page brochure from Pacific Engineering & Production Company of Nevada (PEPCON). Described and illustrated are PEPCON electrolytic seawater systems that generate from 10 pounds per day to any required amount of sodium hypochlorite.

Included are typical flow diagrams for system applications at coastal power plants and fire protection systems, offshore platforms, desalination plants, and other seawater piping installations.

For a free copy of the PEPCON brochure,

Circle 20 on Reader Service Card

Washburn & Doughty Announces Signing Of Three Vessel Contracts

Washburn & Doughty Associates, Inc. of Woolrich, Maine, has announced the signing of three construction contracts and the company's entry into two new markets—a sail-powered passenger vessel and an offshore lobster boat.

Currently under construction is the 73-foot Bay Lady II, a gaff top sail schooner building for Bay Lady Cruises of Bar Harbor, Maine. Designed by Wallstrom & Watkins Associates of Blue Hill, Maine, the new vessel features a triple chine hull and will accommodate 49 passengers for day sailing in Maine waters.

Built to Washburn & Doughty boatyard standards, which meet or exceed ABS requirements for steel vessels under 200 feet, the Bay Lady II will also be in full compliance with applicable U.S. Coast Guard regulations for carrying passengers for hire, lakes, bays and sounds.

The second contract, with the Palombo Lobster Company of Sandwich, Mass., is for a 65-foot offshore lobster boat designed by Washburn & Doughty. With principal dimensions of 65 by 18 feet by 6 feet 4 inches, this vessel will be longitudinally framed through the midportion, with transverse framing forward. Her main engine will be a Detroit Diesel 8V71 rated 230 bhp at 1,800 rpm. Reverse gear will be a Detroit Allison with 3:1 reduction ratio. Delivery is scheduled for July this year.

The third contract has been signed with Poseidon Fishing Inc. of Fairhaven, Mass., for a 107-foot scalloper designed by John Gilbert of Boston. This boat will be a first for the U.S. East Coast fishing industry in that all the engines will be manufactured by Deutz of Germany, sold through Fairhaven Marine of Fairhaven, Mass. The main engine will be a Deutz S/BVM 628, a four-stroke, in-line 6-cylinder engine featuring direct injection. It is rated at 1,264 continuous bhp at 900 rpm. The reverse/reduction gear will be by Reintjes.

This scalloper will have accommodations for a crew of 16, finished in formica trimmed with mahogany. Delivery is expected in the fall of 1984.

Board Approves Spin-off Of Sea-Land Service To Reynolds Shareholders

The board of directors of R.J. Reynolds, Inc. has approved the spin-off of its ocean shipping subsidiary, Sea-Land Industries Investments Inc.

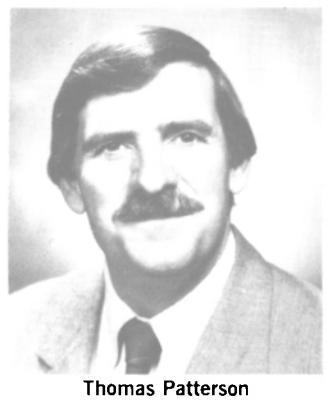
When arrangements for the spin-off of Sea-Land to RJR's shareholders are completed, the board will set record and payment dates for a special dividend of Sea-Land common stock to holders of RJR common stock. The pro rata distribution of stock will transfer ownership of Sea-Land to the shareholders of RJR common stock. The spin-off is expected to be completed in the second quarter of this year.

J. Tylee Wilson, RJR president and chief executive officer, said he is pleased with the board's decision. "We believe that the spin-off will establish both Sea-Land and Reynolds Industries as distinct investment alternatives that will be properly recognized by the investment community," he stated. "It is also consistent with RJR's goal of sharpening its focus on consumer goods and services," he said.

Reynolds Industries had previously reported that when the spin-off is completed, its vice chairman of the board, **Joseph F. Abely Jr.,** will become chairman and chief executive officer of Sea-Land.

Commenting on the spin-off, Mr. **Abely** said, "Sea-Land emerges from Reynolds Industries as the strongest company in the world containerized transportation business. The depth of its management, its worldwide network of facilities and systems, and its very strong balance sheet equip the company to continue to compete most effectively," he stated.

Thomas Patterson Named President-General Manager Of Coastal Iron Works



Thomas Patterson

Thomas L. Patterson has been promoted from vice president to president and general manager of Coastal Iron Works, Inc. of Corpus Christi, Texas. Youngest son of one of the company's founders and long-time presidents, Mr. **Patterson** joined Coastal in 1965, and was named secretary-treasurer in 1969 and vice president in 1971. He is a graduate of the University of Texas at Austin.

Coastal Iron Works is a diversified, 35-year-old corporation with three divisions: the Marine Department, which repairs oceangoing vessels at dockside; the Shipyard Division, which builds and repairs all types of tugs, barges, crewboats, and supply vessels; and the Industrial Division and Machine Shop, which performs industrial and marine repairs. The shipyard recently christened the Mr. Pat, a 200- by 90-foot steel floating drydock, the largest south of the Freeport-Galveston area.

James Company Offers Data Sheet Describing Self-Lubricated Bearings

The Allan P. James Company of Paramount, Calif., has available a free, six-page data sheet to assist the engineer and purchasing agent when specifying and procuring self-lubricated bearings. Complete technical data detailing the chemical and physical properties, with comparative specifications for each alloy and Lubron lubricant, is provided.

For a free copy of this data sheet,

Circle 99 on Reader Service Card

Caterpillar Announces New Marine Diesel Engine Application Guidelines

Caterpillar Engine Division has revised marine propulsion rating definitions to simplify selection and help insure proper application. The following four-level rating system matches Caterpillar marine propulsion systems to a particular application based on vessel operation:

- Continuous—For service with full-throttle operation up to 100 percent of total time;
- Medium Duty—For service with full-throttle operation up to 80 percent of total time with balance of time below rated rpm;
- Intermittent—For service with full-throttle operation up to 50 percent of total time with the balance of time below rated rpm;
- High Performance—For service with full-throttle operation up to 5 percent of total time with the balance of time below rated rpm.

Use of the correct rating based upon these definitions and guidelines provides optimum performance, long engine life, and extended overhaul periods.

In selecting a rating for a specific application, the most important consideration is the time spent at full throttle. The rating definitions identify the percent of time at full throttle and corresponding time at reduced rpm. This rpm reduction lowers horsepower requirements, as propeller demand follows a cubic speed/power curve. For example, an engine operating at 90 percent of rated speed will be loaded by a typical propeller to about 73 percent of rated power. Operating at recommended reduced speed controls the engine load at or below the continuous level. As a general guideline, typical operating parameters for each rating are summarized below:

	Continuous	Medium Duty	Intermittent	High Performance
Time at Full Throttle	100%	80%	50%	5%
Reduced Throttle (% of Rated)	—	95%	90%	85%

Ratings should be applied on the basis of vessel operation and not to an application based only on the type of boat or hull design. Vessel descriptions such as workboat, fishing vessel, or ferryboat, and hull design such as displacement or planing hull do not completely define the operation conditions of the vessel or the power demands required of the engine. These general conditions could have more than one rating applied depending on how the vessel is operated. It is important to remember that the rating selected should match the individual vessel operating profile.

For further information on these Cat guidelines,

Circle 98 on Reader Service Card

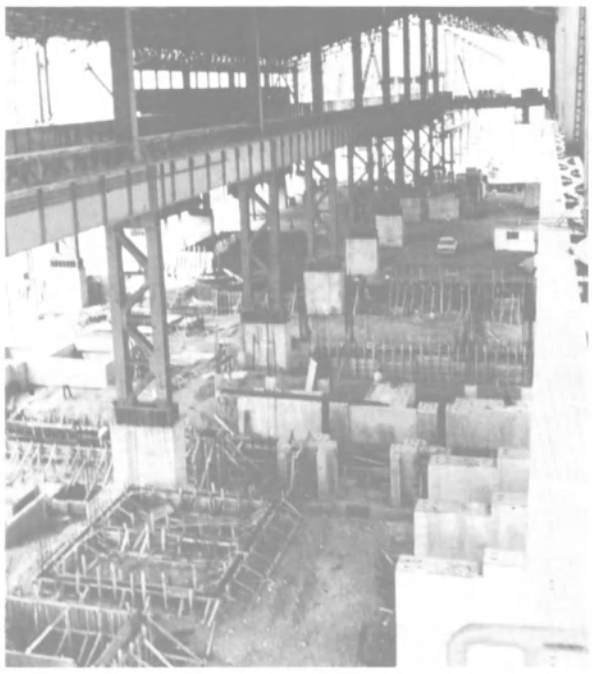
Major North Sea Contracts Awarded To Hydranautics Hydraulic Systems

Hydranautics Hydraulic Systems of Goleta, Calif., is currently manufacturing systems for the Elf Heimdal platform in the North Sea, according to **Basil Peters,** London-based vice president of European operations for Hydranautics International.

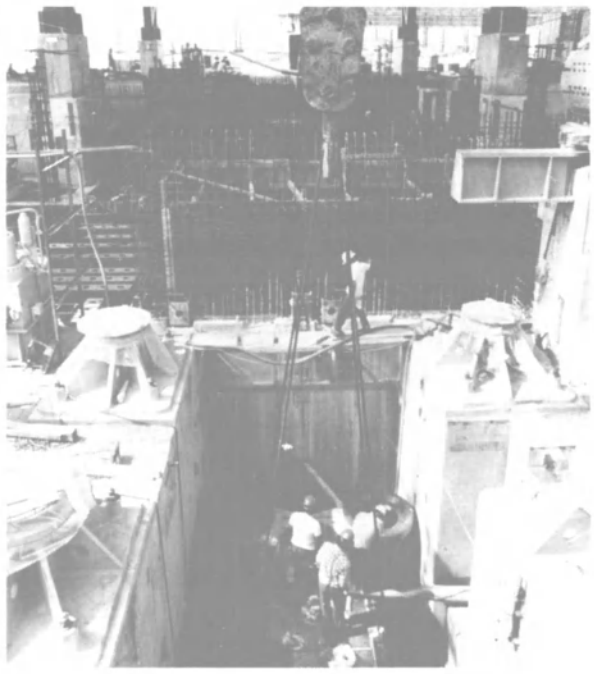
Production of these systems destined for operation in the Norwegian sector is being handled under two separate contracts. The first calls for a rig skidding system and BOP handling system. The rig skidding package will provide longitudinal and transverse moves including the capability for precise rig positioning. The BOP handling system will supply elevation and attitude positioning and horizontal translation of the BOP stack. Ancillary power and controls are included.

The second contract specifies a central hydraulic power unit that will accommodate all of the hydraulic rig tools used on the platform.

NKS Heavy Forging And Casting Facility Nears Completion In Mexico



Interior of the steel making shop under construction at the NKS facility.



Workmen installing the base for the 4,000/6,000 forging press.

NKS is a joint venture of NAFINSA, the Mexican Development Bank, Kobe Steel, a leading Japanese steel producer, and SIDERMEX, the official steel consortium of Mexico.

The erection of the casting, forging, and machine shop buildings, with the plant infrastructure, has been completed on schedule at the site in Puerto Lazaro Cardenas on Mexico's West Coast. The main equipment components including the 4,000/6,000- and 1,500-ton forging presses and the 40-ton electric arc furnace are now at the site and being installed.

A broad range of tools including a horizontal lathe of 2,500/2,000 mm by 15,000 mm, and vertical lathe of 8,500/5,000 mm by 5,000 mm will be installed in the machine shop. A steel casting facility of the most modern design, with production capacity of 20,000 tons annually, is also included in the complex.

Production is scheduled for the first quarter of 1985, at which time NKS will be able to offer the marine industry heavy castings and forgings for rudders, stocks, tail and line shafting, propellers, and related parts of the highest quality, conforming to the standards of the classification societies.

For additional information on the NKS facility,

Circle 85 on Reader Service Card

Michael Hughes Appointed Product Manager At Russellstoll

Michael L. Hughes has been appointed product manager for the Russellstoll Division of Midland-Ross Corporation.

Mr. **Hughes** is the liaison between the division's engineering and sales departments to develop new products and find new applications for existing products. He also investigates new market opportunities and possible product acquisitions for the product lines.

Headquartered in Livingston, N.J., Russellstoll manufactures electrical controls, lighting, plugs, receptacles and connectors, customized electric interlocks and connectors for industrial and marine use. Feedrail®, another product area, includes trolley busway and overhead electrification systems.

Prior to Midland-Ross, Mr. **Hughes** held positions at Phelps Dodge Cable and Wire. He received his MBA in marketing from Mississippi State University and a BS degree in industrial engineering from Rutgers University.

Product Planning Manager Named At American Standard/Heat Transfer

Bob McDonough

The Heat Transfer Division of American Standard Inc. has appointed **Bob McDonough** as its new manager, product planning. Mr. **McDonough** comes to HTD with more than five years' experience in marketing capital equipment and eight years' experience as a chemical engineer.

In his new position, Mr. **McDonough** is responsible for developing new products, modifying existing products and overseeing the marketing department in its support and service to field sales.

In addition to producing heat transfer and other industrial products, American Standard Inc. is also a leading manufacturer of railway, mass transit and automotive braking and control devices; plumbing and other building products; earth- and ore-moving vehicles; bank security systems, and graphic products. The company and its affiliates carry on manufacturing operations in more than 20 countries.

Literature Detailing Access Equipment/Hatch Covers Available From Ascargo

Ascargo S.A. in Bilbao, Spain, designs and manufactures an extensive range of cargo access equipment, including ramps and other RO/RO equipment, hoistable car decks, watertight and fireproof doors, cargo lifts, tank covers, scissors type elevators, and all types of hatch covers.

Since its founding in 1958, Ascargo has supplied more than 2,000 hatch covers that are fitted on hundreds of ships. The company has also carried out thousands of repairs and modifications to existing hatch covers such as rebuilding deteriorated covers to make them watertight, or modifying wire-pull hatch covers to hydraulic operation.

For free literature describing Ascargo's complete product line,

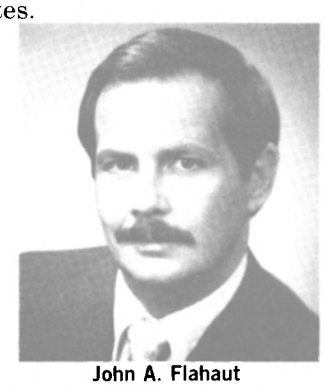
Circle 96 on Reader Service Card

Kienitz And Flahaut Promoted At Pott's Inland Waterways Division

Richard A. Kienitz has been appointed senior vice president-marketing, and **John A. Flahaut** has been promoted to vice president-sales, it was announced by **John F. Lynch,** president of the Inland Waterways Division of Pott Industries, Inc. He also announced that **Thomas F. Maloney,** formerly senior vice president-sales, has resigned to pursue other interests in the marine industry.

Richard A. Kienitz

Mr. **Kienitz** is returning to the Inland Waterways Division after serving as vice president-marketing for Alliance Marine Services of New Orleans for the past two years. In his new position, he will have responsibility for all company marketing and traffic functions. Mr. **Kienitz** is a graduate of Ferris State College in Michigan with a BS degree in marketing. He also received a Transportation and Traffic Management Certificate from the College of Advanced Traffic, Chicago, and is a member of The Propeller Club of the United States.



John A. Flahaut

Mr. **Flahaut,** who was previously assistant vice president-sales, will report to Mr. **Kienitz** on all marketing and traffic related functions, including administration of the regional sales offices. He earned a degree in traffic management from the College of Advanced Traffic.

Both Mr. **Kienitz** and Mr. **Flahaut** will be located at the Inland Waterways Division's headquarters in St. Louis.

Auto Bulk Asks Title XI To Aid In Financing $15-Million Car/Bulk Carrier

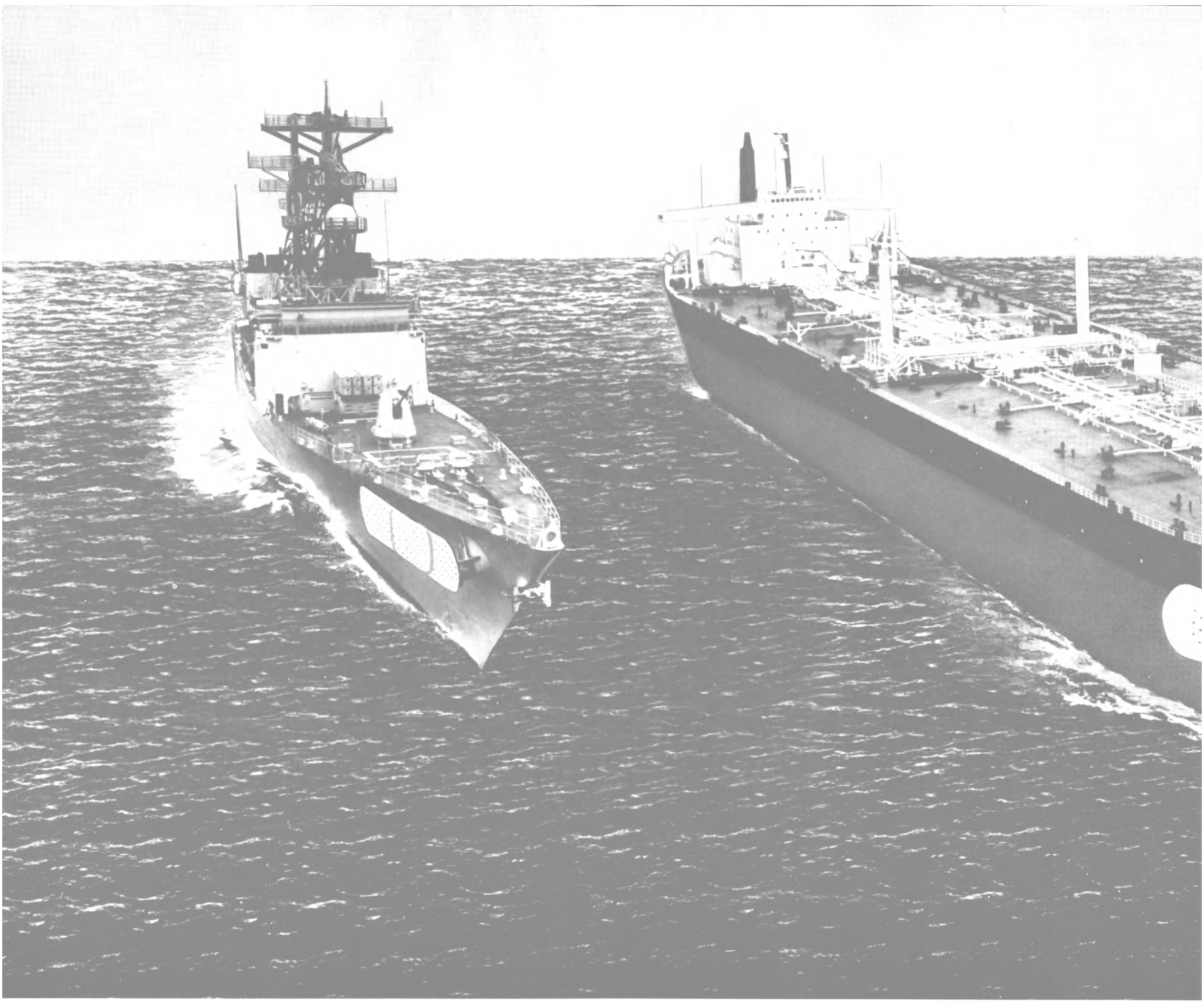
The Maritime Administration has received a request from Auto Bulk Corporation of New York City for a Title XI guarantee to aid in financing the construction of a 33,000-dwt, diesel-powered auto/bulk carrier. If approved, the guarantee would cover $11,250,000, or 75 percent of the estimated cost of $15 million.

The 13,500-bhp vessel would operate in the U.S. foreign and domestic trades. No builder has been selected.

Swiftships Gets $3-Million From Dominican Republic For Two Patrol Craft

Jerry L. Hoffpauir, president of Swiftships, Inc., has announced the receipt of a $3-million contract from the Dominican Republic for the construction of two 110-foot aluminum patrol boats. The contract includes training of the crews and on-going logistic support. The vessels are scheduled for delivery in May and June of this year.

Swiftships, with yards in Morgan City, La., and Pass Christian, Miss., has become well known for its design and construction of military craft, having delivered vessels ranging from 40 to 150 feet to some 20 countries throughout the world.



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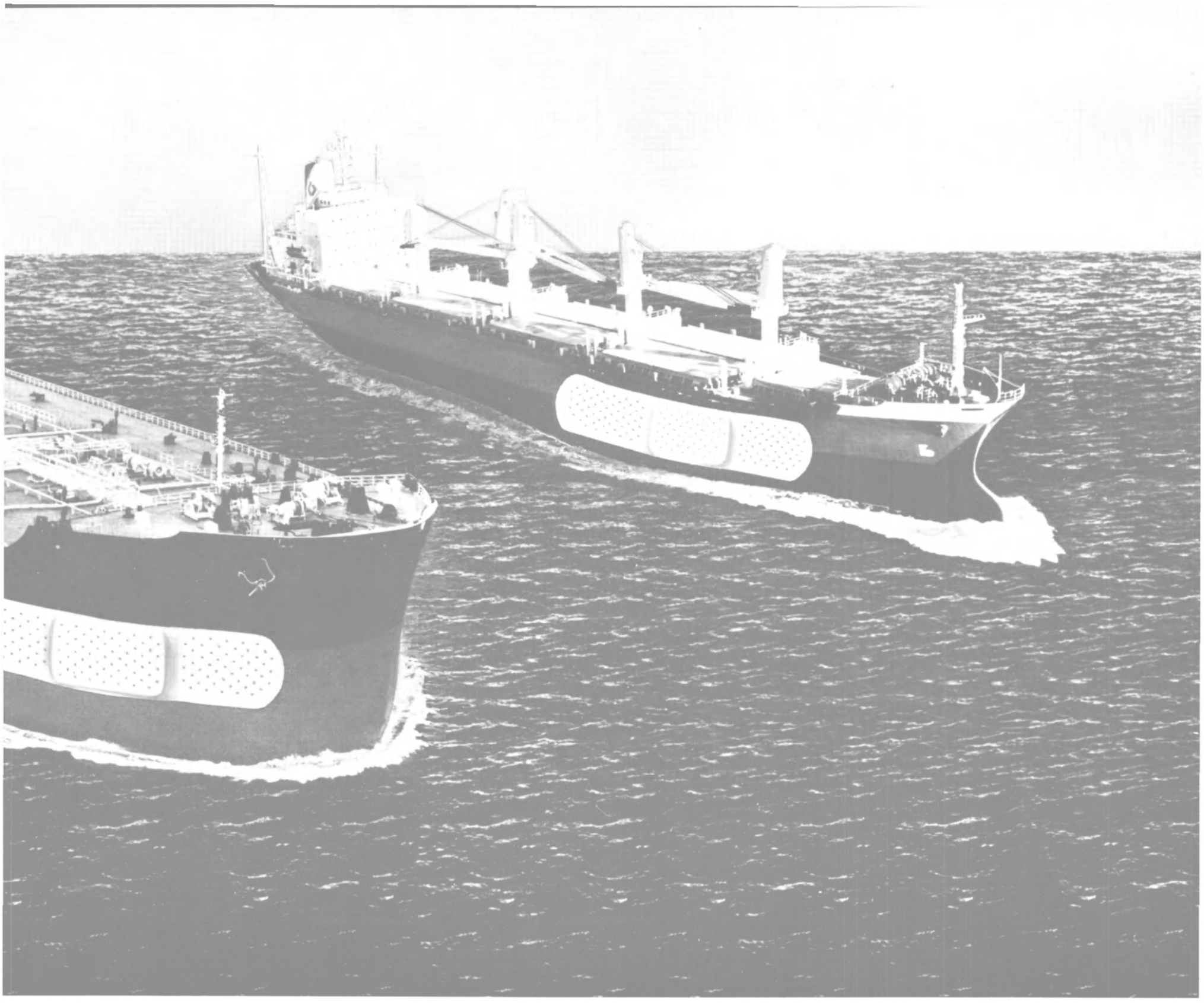
Now, with the opening of our new Portland Overhaul and Repair Facility, the Bath expertise is offered to the commercial shipping world. Our management knows the value of quick turn-around time, and our work force is as skilled and innovative as any in the world. We'll get the job done right... right on schedule...right on budget.

The new Portland facility is a well-equipped, self-contained shipyard just 40 minutes from our main shipyard, close to North Atlantic shipping lanes and situated in the deep-water harbor of Portland, Maine. Our facilities include:

Floating Dry Dock:

- 81,000 ton lift capacity
- 744 ft. length (267 meters)
- 137 ft. clear docking width (42 meters)
- Two 25-ton wingwall cranes



than a patch and a promise.

Piers:

- 1000 ft. (305 meters) and 600 ft. (183 meters)
- 60- and 25-ton crane service

Floating Crane:

- 50-ton capacity

With 70,000 sq. ft. (6,510 sq. meters) outside storage and 25,000 sq. ft. (2,325 sq. meters) inside storage, the facility is serviced by rail, water, highway and air transportation.

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Circle 120 on Reader Service Card

French Named Chairman And CEO At NASSCO—Vortmann Is President

Clarence L. French

Richard H. Vortmann

Alfred W. Lutter Jr.

C. Larry French has been appointed chairman of the board and chief executive officer of National Steel and Shipbuilding Company of San Diego, a wholly owned subsidiary of Morrison-Knudsen Company. In other promotions, **Richard H. Vortmann** has been named president and chief operating officer, the posts previously held by Mr. **French,** and **Alfred W. Lutter** has been appointed senior vice president-marketing and business affairs.

Mr. **French** has served as NASSCO's president and COO for the past six years. He joined the company in 1967 and served as vice president of engineering from 1974 and executive vice president from 1976. He earned BS degrees in mechanical engineering and naval science at Tufts University. Before joining NASSCO, he served as a project manager with Bechtel Corporation and in various production management positions with Bethlehem Steel and Kaiser Steel.

Mr. **Vortmann** has been executive vice president for the past four years. He joined the company in 1976 as vice president-finance, and was elected to the board of directors in 1978. Previously, he was employed by the Kaiser companies for seven years in various financial management and corporate planning capacities. He earned BS and MBA degrees from the University of California at Berkeley.

Mr. **Lutter** joined NASSCO in 1979 as vice president-marketing. He previously had been vice president and general manager of Kaiser Glass Fibers, and had prior management positions with Inmont Corporation and Owens-Corning Fiberglass Corporation. He received a BS degree in electrical engineering from Northwestern University and completed a management program at the Harvard School of Business.

Under the new organization, there will be two areas of responsibility reporting to Mr. **French**. Mr. **Vortmann** will be responsible for the "internal" functions of the company—basically those operations that occur in San Diego. Mr. **Lutter** will have responsibilities that are "external" to the operation of the shipyard.

Raytheon Gets $13-Million Navy Contract For SSN Engineering Services

Raytheon Company, Portsmouth, R.I., has been awarded a $13,385,000 cost-plus-fixed-fee Navy contract for engineering services for SSN combat systems. The Naval Sea Systems Command is the contracting activity.

DoD Implements Initiative For Cost Effectiveness Of Contract Requirements

The Department of Defense (DoD) is implementing a new initiative aimed at developing more cost-effective contract requirements for major system acquisitions. This initiative will address a number of problems inherent in present practices that can result in excessive contractual requirements early in weapon system development.

This initiative was developed in conjunction with the military services under the DoD Acquisition Improvement Program (Initiative No. 14), and will specify "results required" rather than "how to" procedures in requests for proposals and contracts. Detailed specifications and standards will be used only for guidance during the early phases of development, and selectively included in contract requirements for full-scale development and production. The recommended actions also place limits on incorporating contract requirements through referencing in certain specifications and standards. Cost/benefit analysis will be central to decisions on application of contract requirements.

With the implementation of the initiative, industry will be given a greater opportunity to recommend the most cost-effective application of detailed specifications, standards, and other contract requirements. Final decision-making authority, however, will be retained by the government program manager. Emphasis will be given to assuring development of a complete and definitive production design data specification while providing flexibility to use contractor ingenuity and experience to arrive at cost-effective designs.

As directed in a Deputy Secretary of Defense memorandum dated January 11, 1984, each military department is required to identify four major system development programs for initial implementation of these concepts. Within six months, the military departments will provide plans to expand application of these concepts to all new major system acquisitions.

Murdock Announces Name Change And Promotions

Irving, Texas-based Murdock Machine & Engineering Company of Texas has changed its name to Murdock Engineering Company.

Company president **Daniel Heidt** explained the name change was implemented "to enhance our international image in the offshore petroleum and marine industries." Mr. **Heidt** also announced two promotions at the company.

Charles M. Reinhardt

Marvin Baker

Charles M. Reinhardt assumes the new title of director, marketing and technology. He formerly held the position of director, product development and engineering.

Marvin Baker, formerly director, contracts, with the company, has been promoted to director, programs.

Murdock Engineering Company supplies services and products for the offshore petroleum and marine markets.

For additional information and free literature on Murdock products and services,

Circle 32 on Reader Service Card

Ingalls Shipbuilding photo

WATCH SET ABOARD USS IOWA—The American flag was hoisted aboard the battleship Iowa (BB-61) recently for the first time since 1958. The ship, being reactivated and modernized by the Ingalls Shipbuilding Division of Litton Industries in Pascagoula, Miss., is scheduled to rejoin the fleet in April. The Iowa's crew has set the watch and is now living aboard ship.

photo—James P. Stuart

Incinerator Ship Apollo One Launched At Tacoma Boatbuilding

The Apollo One, first oceangoing hazardous waste incinerator ship designed and built in the U.S., was launched at the Tacoma Boatbuilding Company's Yard No. 3 in Tacoma, Wash., recently. The $37-million vessel and a sister ship, the Apollo Two, are being constructed for At-Sea Incineration, Inc. (ASI) of Port Newark, N.J., a wholly owned subsidiary of Tacoma Boat.

Built with the aid of Federal Title XI loan guarantees, these ships have been designed to meet all existing environmental and safety standards of the U.S. Coast Guard, the Environmental Protection Agency, the Maritime Administration, and the National Bureau of Standards, among others, and are the first of their kind to meet the criteria of the American Bureau of Shipping.

The Apollo One can safely destroy up to 30 million gallons of hazardous waste each year. She is the first in a fleet of ships that ASI will operate at Federally approved ocean burn sites. The currently approved site is in the Gulf of Mexico near Cameron, La.; the other, whose approval is expected shortly, is in the Atlantic Ocean. Both are 150–200 miles out at sea.

To support the burning of hazardous waste materials at sea, ASI will operate a multi-million-dollar marine transfer terminal near each of the burn sites. These commercial terminals will collect, test, blend, and temporarily store a variety of hazardous waste materials prior to transferring them to the incineration ships for disposal.

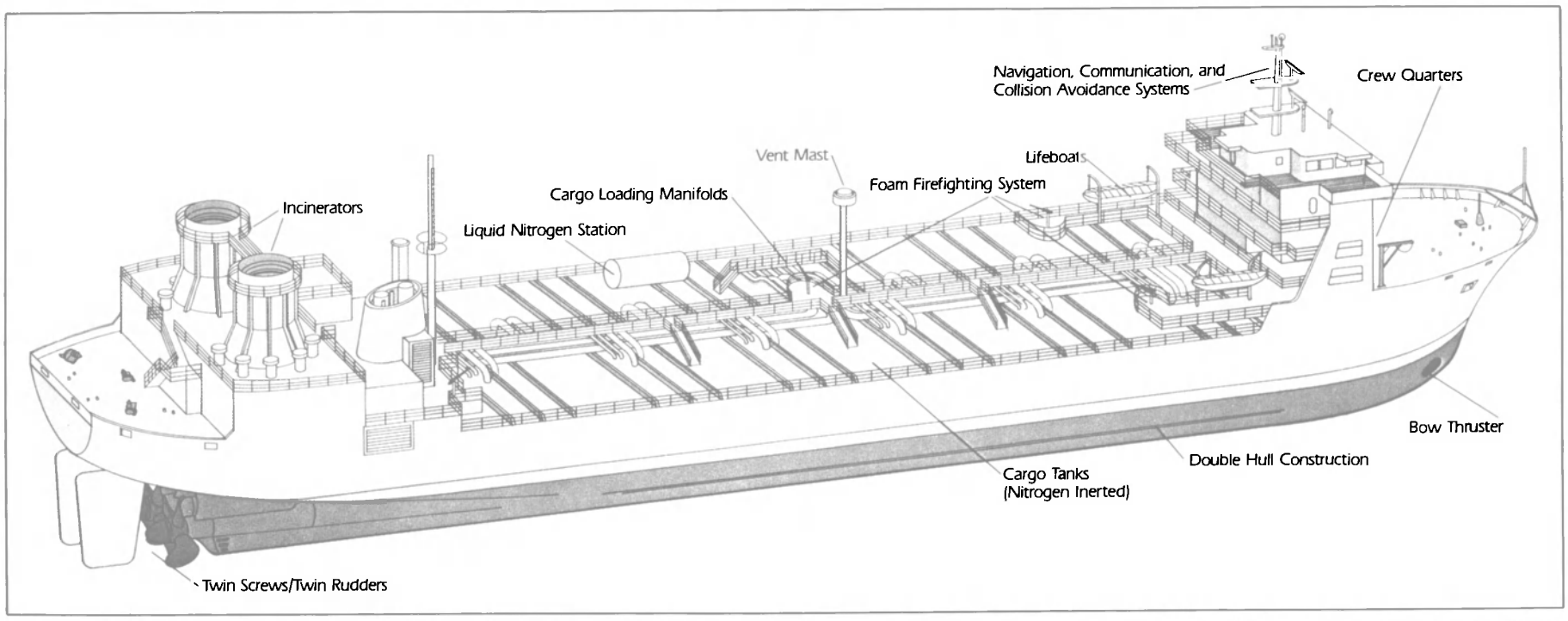
The launch of Apollo One culminates years of cooperative effort among international regulatory agencies, the Federal Government, and private industry to develop an environmentally acceptable alternative to the inadequate and often dangerous hazardous waste disposal methods of the past.

Classed by the American Bureau of Shipping as +A1 E Chemical Carrier, +AMS, +ACCU, +IS, the Apollo One is designed with accommodations forward, chemical waste cargo tanks amidships, and propulsion and incineration machinery aft. A forecastle deck is provided forward and a poop deck aft.

Twelve integral cargo tanks are located to comply with requirements for a Type II cargo containment system. A pipe trunk is provided on center line throughout the length of the cargo space and from the inner bottom to the main deck. Transverse cofferdams are installed between cargo tanks. Ballast tanks are located outboard of the cargo tanks, in the double bottom space, and deep tanks for-

APOLLO ONE
Major Suppliers

Main engines (2)	Caterpillar
Reduction gears (2)	Caterpillar
Propellers (2)	Columbian Bronze
Engine controls	General Electric
Shaft bearings & stuffing boxes	Johnson Rubber
Bow thruster	Bird-Johnson
Thruster motor	GE
SS generators	Caterpillar
Switchboards & transformers	GE
Steering system	Hough Marine
RPM indicators	Electric Tachometer
Motor controllers	Graybar
Air compressors	Rogers Machinery
Air receivers	Roy E. Hanson
Inert gas system	Process Systems
Tank washing system	Prosser East
Pumps	Argo Marine/Byron Jackson Cascade/Coen/Dean Bros. Kem Equipment/Power Pump
Flume design	McMullen
WT doors, hatches & scuttles	Freeman
Sliding WT doors	Walz & Krenzer
Anchors & chain	Washington C&S
Accommodation ladders	Rampmaster
Windlass & winches	Northern Line
Sewage treatment plant	Effluent Technology
Waste incineration system	Coen
CO_2 system	Wormold
Foam system	National Foam
Fire detection system	General Fire
Air conditioning	York
Refrigeration	Borg-Warner
Whistle	Kahlenberg
Searchlights	Apollo Marine
Navigation lights	Tacoma Marine
Nav. light panels	Henschel
Lifeboats	Atco Marine
Life rafts	Nordby Supply
Vent. fans	New York Blower
Batteries	ITT Mackay
Heaters & strainers	Familian NW
Valves	Coen/Familian/Liberty Equip. Seaport Controls/Waukesha Bearings
Radar & CAS	Raytheon
Loran C	Griffith Marine
Satcom system	Electro Nav
Satnav system & SSB	Sea Mar Electronics
VHF	ITT Mackay
Gyrocompass	Sperry Marine
Fathometer	Sea Mar Electronics
Coatings	Devoe
Facsimile	Griffith Marine



ward and aft. Fuel oil tanks are provided aft and fresh water tanks forward.

The vessel has an overall length of 396 feet, molded beam of 60 feet, molded depth of 31 feet, and design full-load draft of 23 feet 6 inches. Deadweight a full-load draft is 7,317 tons. Liquid cargo capacity (100 percent full) is 197,730 cubic feet. Accommodations, berthing, messing, and lounges are provided forward for a total complement of 25 persons. The wheelhouse and radio rooms are also forward. A cargo pump room is located aft of the cargo space, with access to the main deck. Two Flume stabilization tanks are fitted above the cargo pump room.

Two liquid waste incinerators are installed on the poop deck aft of and above the propulsion and auxiliary machinery space. An incinerator forced-draft fan room is provided immediately below the

(continued on page 22)

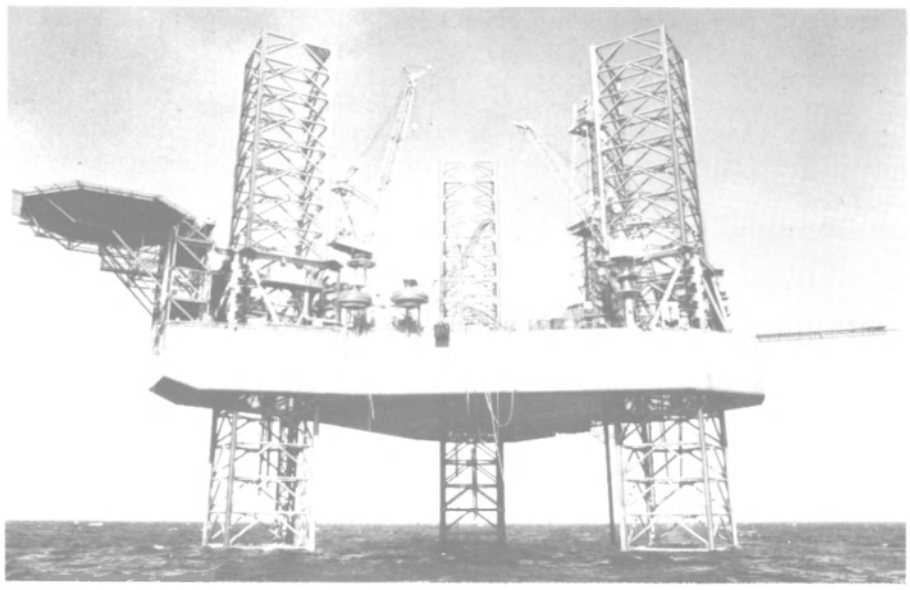
Apollo One

(continued from page 21)

incinerators. A central control room is located forward of the incinerator room for monitoring and controlling all cargo handling and waste incineration processes and well as centralized control of propulsion and auxiliary machinery.

Main propulsion is provided by twin Caterpillar D399T, 16-cylinder, 4-stroke diesel engines, each rated 1,125 bhp at 1,225 rpm. The engines drive Columbian Bronze fixed-pitch propellers through Caterpillar reverse/reduction gears. Engine controls (ACCU) were supplied by General Electric. A Bird-Johnson bow thruster is provided, powered by a GE 400-hp motor. Two auxiliary generators are also driven by Caterpillar D399T diesels.

ON THE COVER



Marathon-Built Rowan Gorilla I Now Drilling Offshore Nova Scotia

The Rowan Gorilla I, the first Gorilla Class jackup rig built by Marathon LeTourneau's Marine Division in Vicksburg, Miss., is now on location 268 miles east of Halifax, Nova Scotia, near Sable Island, an area where extreme cold is part of the working environment. The rig's winterizing features are said to be working quite well.

Owned by the Rowan Companies, Inc. of Houston, the new rig is on its first drilling assignment. It is working in 207 feet of water drilling a rank wildcat for a group of Canada-based companies including Bow Valley Industries Ltd., Husky Oil Operations Ltd., and ATS Explorations.

The rig left New Orleans in December 1983 and made its first tow, 2,300 miles to Halifax, in 17 days. The Gorilla's hull has been redesigned, and proved to tow very efficiently. The largest electromechanical jackup ever designed and built by Marathon, a Gorilla Class rig can operate year-round in remote offshore areas with hostile operating conditions.

Gorilla Class units have the unique Marithon LeTourneau Slotilever™. This means the rig can not only cantilever the derrick out beyond the stern but can also drill during design storm conditions with the drilling package fully retracted into the slot. Gorilla rigs are also capable of ocean tows and field moves with all 504 feet of leg in place; this greatly adds to the rig's mobility. The size of the Gorilla rig—the main deck covers nearly one acre—allows for storage of large quantities of drilling consumables. These rigs can continue to work even if resupply is temporarily interrupted.

Classed +A1 by the American Bureau of Shipping and constructed in accordance with U.S. coast Guard Mobile Offshore Drilling Unit Regulations, the rig also meets or exceeds the requirements of the Canadian Coast Guard, the U.K. Department of Energy, and the Netherlands Department of Mines. The Gorilla has been designed by Marathon to survive up to 90-foot waves and 82-knot winds when drilling in 328 feet of water.

The Rowan Gorilla I has power to spare, with seven Caterpillar D399 diesel engines with a total output of 11,080 at 1,225 rpm. These drive seven generators that produce a total of 7,210 kw. Power for the rig's propulsion assist system is provided by eight electric motors with a total output of 6,800 hp, connected through gearboxes to two 112-inch propellers in Kort nozzles. These motors are mounted on the machinery deck on either side of the drilling slot. When using a 10,000-bhp tug, the assist thrusters will increase the towing speed by about two knots.

Living accommodations are provided on the Rowan Gorilla I for 80 persons. Other features include a six-bed hospital, dual galleys, dining room, and recreation facilities. The rig's survival system consists of two 50-person and two 34-person Whittaker enclosed capsules, approved by the U.S. Coast Guard and fitted with communications systems. An octagonal helipad cantilevered out over the bow has a diameter of 83 feet and is elevated approximately 75 feet above normal draft for sea tow purposes.

Two other Gorilla Class rigs are currently under construction, one at Marathon's Singapore yard for late 1984 delivery and one at the Vicksburg yard for delivery in 1985.

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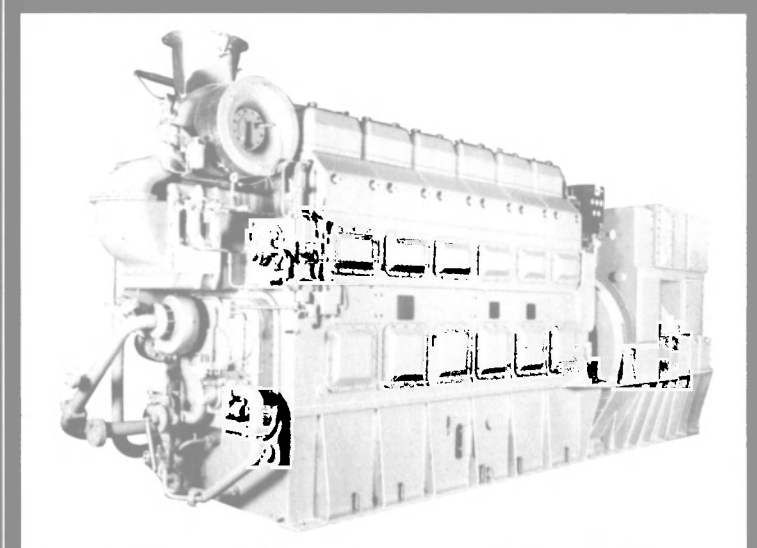

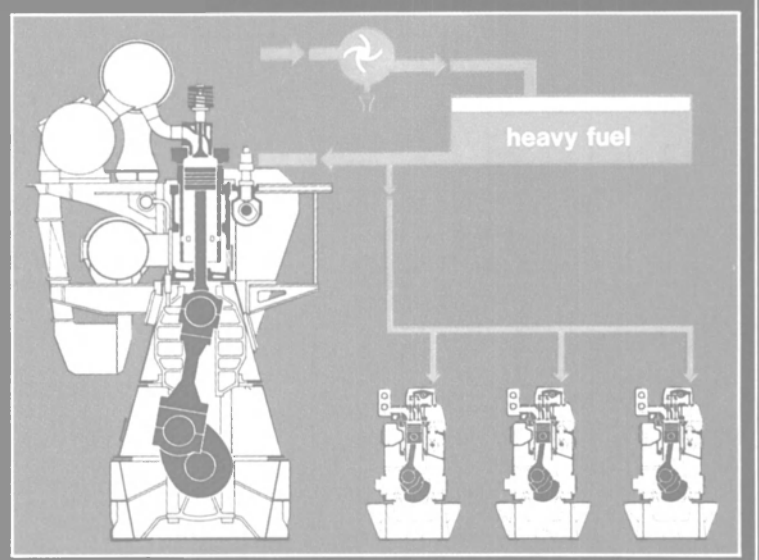

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Bay-Houston Appoints Four Executives

Thomas A. Moran Jr.

The appointment of **Thomas A. Moran Jr.** as executive vice president-Marine Division of Bay-Houston Towing Company was announced recently by **Cecil R. Haden,** president.

Formerly vice president marine sales, Mr. **Moran** will assume responsibility for overall operation of the division, which is Texas's largest harbor towing company. It operates in the ports of Houston, Galveston, Texas City, Corpus Christi and Freeport.

Mr. **Moran** has been with Bay-Houston for 10 years. A licensed officer in the United States merchant marine and a former Reserve Naval Officer, Mr. **Moran** began his career aboard tugs in New York Harbor, coming ashore to work in both operations and chartering for Boyd, Weir and Sewell. He later joined the Curtis Bay Towing Company as a sales representative in its New York office.

Mr. **Moran** holds a degree in business administration from Gettysburg College, Pa., with a major in accounting, and a Bachelor of Science degree in marine transportation from Texas A & M University, where he was corps commander of the Texas Maritime Academy.

Other Bay-Houston appointments include **William (Bill) McDonald,** who has been named marketing manager—Marine Division. Mr. **McDonald** has been with the company for nine years and previously served with Todd Shipyard in Galveston.

Marc Bickham has become assistant marketing manager—Marine Division. He joined the firm in 1981.

L. Gene Autry has moved up to operations manager—Marine Division. He joined the company full time in 1977. Earlier he was a principal in Autry & Tucker Flying Service.

Alden Introduces New Whip Antenna For Radiofax — Literature Available

Alden Electronics, Inc. of Westboro, Mass., has introduced the Alden/Metz Marinefax HF antenna for use with its popular line of Marinefax weather chart recorders.

The Alden/Metz antenna is a compact passive unit designed specifically for the reception of radiofacsimile transmissions. It provides an alternative to long wire and large passive whip antennas. Reception range tests performed by Alden have verified that the antenna's performance is equal to existing long wire and active antennas. It is also suited for use as an SWL antenna.

The Alden/Metz antenna is a slim, stainless-steel 54-inch whip mounted to a silver-plated post attached to a 1½-inch-diameter steel coil. It requires no ground radials, nor is there any chance of internal breakage found with fiberglass antennas.

The new antenna is compatible with all models of the Alden Marinefax recorders, including the Marinefax V, which features unique dual memories for storage of worldwide radio frequencies, plus storage of up to 10 frequencies for single button recall.

For further information and free literature on the new antenna,

Circle 92 on Reader Service Card

Marine Travelift Introduces Another New Model In Its Boat Hoist Line

Marine Travelift, Inc. of Sturgeon Bay, Wisc., has announced another new model in a continuing program of development of its "Beam Forward" design concept for mobile boat hoists. Latest in the series is the 60BFM model with a lifting capacity of 60 tons.

Besides numerous maintenance and efficiency features, the new hoist also has a variety of operator conveniences to permit fast handling of a wide variety of commercial and recreational vessels.

The first 60BFM was delivered to a busy West Coast marine. Succeeding models were installed in Florida and in various East Coast operations.

For details, prices, and delivery information on the 60BFM,

Circle 21 on Reader Service Card

Norwinch And MTT Unveil New Shipboard Crane — Literature Available

Two companies based in Bergen, Norway—Norwinch and MTT (Marine Transport Technology) A/S—have developed an electro-hydraulic cargo crane, the prototype of which has been demonstrated to a number of ship owners. According to **Reidar Rasmussen,** sales manager for Norwinch, the new crane has created a great deal of interest abroad, and orders have already been received. Production under license has been established in Spain, where seven cranes are already under construction.

MTT is an engineering company that specializes in the construction of cranes for the merchant fleet and the offshore industry. **Tor Roksvaag,** director of MTT, says that the company supplies ships' equipment worth approximately 20 million Norwegian kroner annually. He states that the new crane incorporates several advantages compared with cranes of similar type. The crane requires a minimum of deck space, which is especially important for containerships.

The Norwinch low-pressure hydraulic components chosen for operating the new crane are well known for their reliability, and are especially suited for continuous running under severe conditions with a minimum of inspection and maintenance. Last year Norwinch had total sales of approximately 200 million NOK.

The new crane will be marketed through the Norwinch Group's worldwide agent network.

For further information and free literature on the new crane,

Circle 29 on Reader Service Card

Hydra-Dynamics Offers Brochure On Its Air And Hydraulic Cylinder Line

Hydra-Dynamics, Inc. of Wilmette, Ill., has available a new catalog describing its line of heavy-duty, welded-design air and hydraulic cylinders up to 60 inches in diameter and with operating pressures up to 5,000 psi.

Typical severe service applications where this design has proven itself include offshore drilling rigs, sub-sea pipeline clamps, material handling, construction equipment, machine tools, and foundries.

The company considers service a critical part of its operations, and has established a 24-hour-a-day, seven days per week hotline—(312) 251-2400—for its customers. In addition to its standard catalog line, Hydra-Dynamics will custom design and manufacture cylinders to virtually any specification.

For a free copy of the new Hydra-Dynamics catalog,

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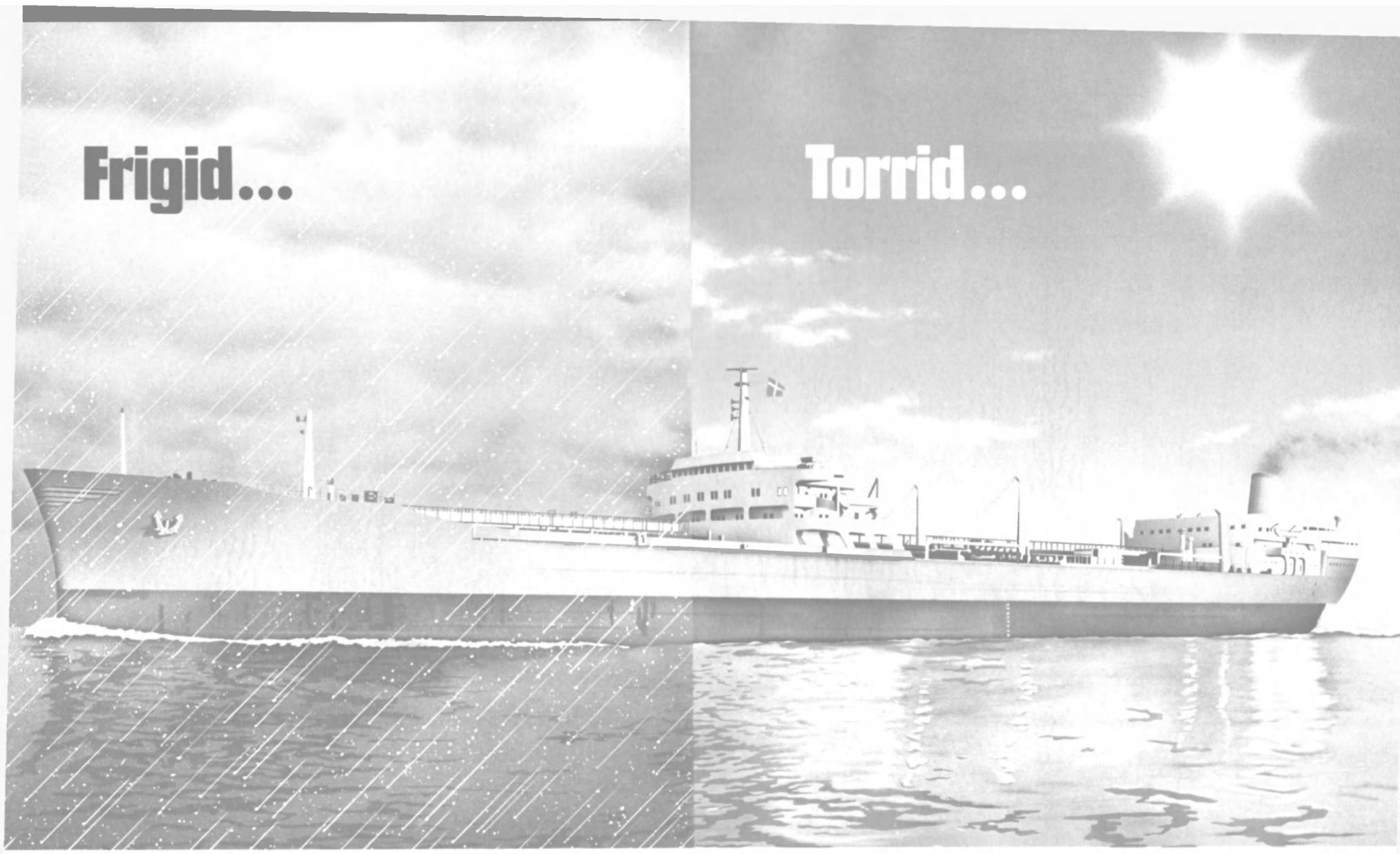

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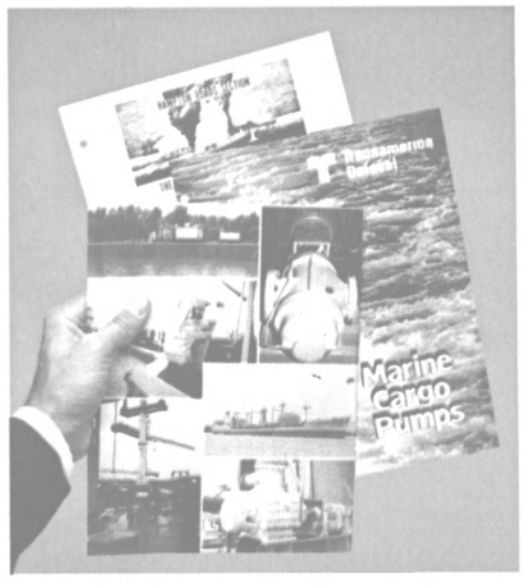

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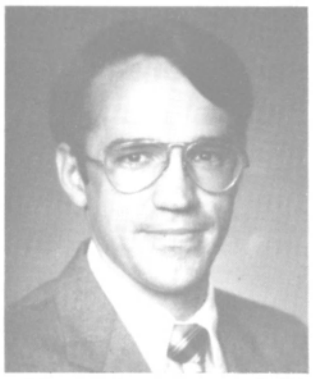
Crane Joins International Marine Terminals As Transportation Coordinator



John Crane

John C. Crane has been named transportation coordinator for International Marine Terminals (IMT) of New Orleans. The announcement was made by IMT vice president **William E. Hall II.**

Mr. **Crane** will coordinate all river and deep-sea activity between IMT customers and the terminal located in Plaquemines Parish at Myrtle Grove, La.

IMT, a joint venture of Houston Natural Gas Corporation, Occidental Petroleum Corporation, and Florida Progress Corporation, is a modern transfer facility equipped with three ship berths, and offers a wide range of services to the coal and dry bulk industries. The terminal began operations in 1978 and completed a $63-million expansion program in March of 1983.

Tanker Owners Federation Will Study Oil Spill Clean-Up For U.S. Navy

The International Tanker Owners Pollution Federation, headquartered in the United Kingdom, has been asked to undertake a study for the U.S. Navy to identify resources for combating oil spills in certain high-risk areas in Europe, it was announced recently by **John Archer,** managing director of the Federation. The study will assess the risk potential of different sizes of oil spills, and comment on the adequacy of existing Navy clean-up resources.

A total of 26 locations will be surveyed in eight countries: France, Greece, Italy, Norway, Portugal, Spain, Turkey and the United Kingdom. A preliminary study has been carried out for one U.S. Navy Activity Area in Naples, Italy and for one NATO Fuel Terminal Area in El Ferrol, Spain. Other high-risk locations to be included in the study will be U.S. Navy Discharge Ports and U.S. Strategic Petroleum Reserve Loading Ports.

"Taking U.S. Navy oil spill statistics, the function of the location, and the types and qualities of oil handled," commented Mr. **Archer,** "we will study the risk factors and determine what clean-up resources are required."

Hayward Offers Free Slide Rule Selector For Pipeline Strainers

Hayward Industrial Products, Inc. of Elizabeth, N.J., a leading manufacturer of pipeline strainers, is now offering a complementary strainer slide rule selector. The selector enables anyone to specify the proper size basket strainer for their particular requirements. The only information needed is rate of flow, liquid viscosity, and specific gravity.

The Hayward selector is applicable to strainers having either plain or perforated screen baskets or mesh-lined baskets with fineness down to 200 mesh, and flow rates from 10 to 10,000 gallons per minute. Built-in factors automatically compensate for the three primary variables. All the user has to do is decide what pressure drop he wants; the result is fast, accurate selection of the proper strainer size.

For a free Hayward strainer selector,

Circle 49 on Reader Service Card

TeleSystems Opens Maritime Sales Offices In New York And Los Angeles

COMSAT TeleSystems, Inc. recently announced the opening of maritime sales offices in New York City and Los Angeles. The offices will provide marketing support for the company's MCS-9000 communications satellite ship earth station and its new ship weather routing, tracking, and port forecasting service—the Masters' Weather Center.

The New York office will be headed by **Edward Dooley,** TeleSystems, Northeast maritime sales manager, and **Lawrence Moore,** manager of the Masters' Weather Center. It is located at 17 Battery Place, New York, N.Y. 10004; telephone (212) 514-7100.

The West Coast office, located at 100 East Thousand Oaks Boulevard, Thousand Oaks, Calif., telephone (805) 497-3722, will operate under the direction of **David Siemens,** who recently joined TeleSystems as manager of maritime marketing for the western United States and the Far East.

Designed and manufactured by TeleSystems, the MCS-9000 offers a full range of satellite communications capabilities. It features extremely compact below-decks equipment, advanced terminals software, and a passively stabilized antenna system. With the recent acquisition of the Masters' Weather Center, TeleSystems has become the only supplier of maritime terminals that also provides operations-critical environmental information.

COMSAT TeleSystems, Inc. located in northern Virginia, designs, manufactures, markets, and provides worldwide service and support for a complete line of advanced analog and digital communications equipment and systems.

Systems Management Gets $7½-Million Increase For Navy Computer Systems

Systems Management American, Norfolk, Va., has been awarded a $7,582,530 cost-plus-incentive-fee increase to a previously awarded Navy contract to exercise options for the delivery and shipboard installation of 11 AN/UYK-62(V) (SNAP II) computer systems, associated hardware, and spares. The Naval Sea Systems Command is the contracting activity.

Amot Controls Introduces New Sensing Switches — Literature Available

Amot Controls of Richmond, Calif., has announced the availability of a new family of pressure and temperature sensing switches, the 8250 Series, designed specifically for application on vibrating equipment. These rugged switches have adjustable set points and are constructed with a union that allows installation in tight places where interference does not permit rotating the switch body. Seven models are available to cover pressures from 0.25 to 7,600 psi, vacuum from 1 to 20 inches of mercury, differential pressures from 0.5 to 10 psi, and temperatures from 61 to 500 F.

In addition, an eutectic alloy temperature switch is available for sensing bearing temperatures from 174 to 343 F. Applications also include fluid and gas temperature sensing when used in a well. These devices feature permanent calibration, and no periodic checking is required.

The entire 8250 Series switch family features raintight housings and is applicable to engine and compressor controls for monitoring such parameters as low oil pressure, high jacket water temperature, high or low compressor suction or discharge pressure, high gas compressor discharge temperature, low engine water pump differential pressure, fluid levels, etc.

For further information and technical data sheets,

Circle 23 on Reader Service Card

Sonat Exploration Names Executive Vice President

W.F. (Bill) Ammentorp has joined Sonat Exploration Company as executive vice president. Mr. **Ammentorp** will have responsibilities for exploration, land, financial, engineering and corporate planning functions, said Sonat Exploration president **Don Leigh**.

Mr. **Ammentorp** most recently served as president of the exploration and production group of InterNorth Inc., Houston. He earned his MS and BS degrees in geology from the University of Wisconsin. He is a member of the American Association of Petroleum Geologists as well as local geological societies in various sections of the country.

A subsidiary of Sonat Inc., Sonat Exploration Company, headquartered in Houston, is involved in domestic exploration and production of oil and natural gas. It has lease interests in about 350,000 acres in the Gulf of Mexico and about three million acres onshore in the south, the Appalachians and the Western United States.

Sonat Inc. is a $3-billion energy and energy services company headquartered in Birmingham. Its other businesses include natural gas pipelines, international offshore drilling, marine transportation, oil field services and forest products.

Drew Ameroid Unveils New Fuel Additive — Literature Available

Drew Ameroid® Marine of Boonton, N.J., has introduced a new fuel additive called Amergize™ deposit modifier/combustion improver that is said to provide increased fuel efficiency and substantial cost savings. At the same time, Drew has announced cost savings to users of Amergize based on a rebate equal to one-half the price of a simplex dosing system.

Available worldwide, Amergize is a specially formulated, concentrated blend of organometallic compounds developed to improve diesel engine combustion, reduce smoking, and lower valve and turbocharger deposits. It is completely soluble in all fuels, does not become saturated or leached out by water, and does not harm engine parts or close-tolerence fuel-metering equipment.

The additive improves combustion by breaking up long-chain, high-molecular-weight hydrocarbons that are so prevalent in today's marine bunkers. It also modifies deposit-forming compounds to minimize high-temperature corrosion and deposit formation.

Amergize is effective at concentrations as low as one liter per six tons of fuel, and is dosed into the fuel line by means of a metering pump. It contains magnesium and rare earth materials that enhance fuel utilization and combustion, and reacts with fuel impurities to minimize damage to engine parts. Amergize also reduces the formation of corrosive sulfuric acid by reacting with vanadium pentoxide, a catalytic material that causes sulfuric acid to form during combustion. It combines with these and other harmful contaminants in the ship's fuel, causing them to form more stable and less corrosive compounds that are harmlessly passed out of the engine as a high-melting-point ash.

Drew service representatives will assist ship managers in determining specific treatment rates for bunker fuels high in vanadium, sodium, and sulfur. In addition, Drew offers a Pace® fuel evaluation program to help determine fuel characteristics present prior to dosing.

For further information and free literature on Amergize and Drew's special dosing system offer,

Circle 88 on Reader Service Card

Thornton Named President Of Martime Capital, Inc.

Roger A. Picchi, chairman of Maritime Capital, Inc. of San Francisco, has announced that **D. Whitney Thornton II** has been named president of the company. Maritime Capital is the parent of two ship repair and conversion subsidiaries—SFW Corporation located in San Francisco, and San Diego Iron & Steel Fabricating, Inc. Mr. **Thornton,** who previously was executive vice president of SFW Corporation, will also serve as president of Maritime Capital's two subsidiaries.

SFW recently embarked on a facilities expansion program with the lease of additional land and pier space from the Port of San Francisco. The company's facility now encompasses 18 acres with 5 berths, totaling 4,200 feet of pier including berths of 1,000 feet and 1,100 feet.

SFW also announced the promotion of **J.L. Vaughn** to the position of general manager. He has been with SFW since 1977 as head of the Planning and Estimating Department and as assistant general manager. In addition, **L.J. Pinchini** has been appointed chief engineer. He retired from the U.S. Coast Guard as San Francisco's chief naval engineer.

Raymond International Expands Offshore Services To U.S. West Coast

Raymond International Inc. of Houston has expanded its services to the offshore oil and gas industry by establishing an offshore projects group at the Oakland, Calif., headquarters of Raymond's wholly owned subsidiary, Raymond Kaiser Engineers Inc. The new group will provide engineering and construction management services for offshore projects. Raymond International, through its other subsidiaries, also provides fabrication and installation of offshore platforms, and installation of subsea pipelines.

The Oakland-based group is headed by **Edward M. Nelson,** who recently joined Raymond Kaiser Engineers as division manager for offshore projects. **William P. Kincy** has transferred to Raymond Kaiser Engineers from another Raymond subsidiary in Houston as business development manager for offshore projects.

Raymond Kaiser Engineers also provides engineering and construction management services from its Houston offices. **Paul E. Marshall** has recently transferred from Oakland to the Houston office to coordinate the company's marketing efforts in the Gulf Coast area.

Greig Placette Forms Export Consulting Firm —Literature Available

Greig Placette has announced the formation of Placette Enterprise Corporation, Houston, a firm that serves manufacturers and distributors worldwide. Mr. **Placette,** a former president of an international supply house, will serve as president of the new consulting firm. His worldwide expertise dates back to 1967 with the Peabody Dore Company.

The firm provides a service of utilizing long established global contacts and advises them of U.S. client's products. The firm has developed a data bank of over 1,850 contacts, which include government agencies, worldwide Chambers of Commerce, trade publications, corporate sources, and professional trade organizations. There is a one-time fee for the service.

For complimentary literature describing the services of Placette Enterprise Corporation,

Circle 48 on Reader Service Card

Caterpillar Adds Rebuilt Fuel Pump/Governor Line —Literature Available

In keeping with its commitment to superior product support, Caterpillar has just released three ad-

ditional fuel pumps and governors for Cat 3306 engines. These factory-remanufactured pumps and governors are priced at approximately 30 percent of new, yet carry the same warranty as new units—six months, unlimited mileage. They come fully assembled and have had a 20-point computer test. Ready for installation, they cut downtime to a minimum.

For further information and free literature,

Circle 47 on Reader Service Card

Penewell Appointed To Sales/Marketing Post At Southwest Marine

E.J. Penewell

E.J. Penewell has joined Southwest Marine, Inc. (SMI) in a sales and marketing capacity to be West Coast representative for Wartsila Diesel. He is responsible for sales, parts, and service for the Wartsila Vasa 22 and 32 engines ranging from 710 to 9,180 bhp, and will be located at SMI's Terminal Island (Los Angeles) yard.

Mr. **Penewell** had been district manager for Fairbanks Morse Engine Division in the Los Angeles Area since 1977.

Southwest Marine is a major repair shipyard with facilities in San Diego, Terminal Island, and San Francisco.

Airco Introduces New Pulsed Welding Systems — Literature Available

Airco Welding Products has announced the introduction of the newest member of its family of Pulse Arc™ welding systems for pulsed spray transfer welding. The Pulse Arc 500 system, like the Pulse Arc 350 model, is designed around the pulsed spray process. The process allows for spatter-free welding and excellent arc control in applications ranging from high deposition out-of-position welding on thick plate to smooth, low-distortion welding on thin gauge materials.

The Pulse Arc 500 system has the power to handle large diameter cored wires up to 3/32 inch and can pulse Metal-Cor® 6 wire for high deposition rates. The system also has exceptional smaller diameter performance characteristics. Like the Pulse Arc 350, the 500 model is a complete system consisting of a transistorized 500-ampere air-cooled or 550 ampere water-cooled gun. The fully integrated machine takes the normally complex engineering requirements of pulsed spray welding and translates them into a few simple pushbutton functions—at a price comparable to a standard MIG package.

The pushbuttons and toggle switches allow the operator to select among pulse, spray and dip transfer processes. He then presses the appropriate switches for the required wire diameter and shielding gas, and he's ready to go. A single knob on the remote pendant simultaneously sets welding current, voltage, wire feed speed, and pulse frequency. The advanced solid-state circuitry automatically controls all parameters.

The system is pre-programmed for stainless and mild steels, but other wires, such as silicon bronze and aluminum can be used by referring to the easy-to-read process selector charts. The Pulse Arc 500 system is well suited for plants where one machine is needed to perform several welding operations.

For further information and free literature on the Pulse Arc 500 system,

Circle 11 on Reader Service Card

New Corporate Brochure Now Available From PBR Offshore Marine

PBR Offshore Marine Corporation of Morgan City, La., has recently published a new 12-page, corporate capability brochure. Included in the full-color publication are PBR's history; current scope of operations, including domestic and international bases and service locations; support facilities; and new construction activity.

PBR is a major marine transportation company serving the international offshore petroleum industry. The company operates more than 120 vessels and employs more than 800 people.

For a free copy of the new PBR brochure,

Circle 46 on Reader Service Card

Wynholds Company Will Provide Computer Systems For Maersk Line Ships

The Hans W. Wynholds Company (HWW) of Cupertino, Calif., recently signed its third major maritime contract—a multi-year project with Maersk Line, Ltd. of New York—to provide computer hardware, software, documentation, training, and support for both shipboard and shoreside applications. The hardware will be the HP250 super-micro computers manufactured by Hewlett-Packard.

The five systems include three identical shipboard computer systems for the administration of crew payroll/overtime and for spare parts inventory control. The Maersk ships will be at sea for extended periods of time; contact between the shipboard and New York office computers will be maintained by satellite communication. A specially designed electronic mail capability will automate the computer linkup and minimize the data transmission expenses.

One home office system will handle corporate accounting and vessel/voyage accounting, providing special management reports broken down by ship, voyage, agent, and account number. All of the computers will have word processing and electronic spreadsheet capability.

HWW computerized the three new c-9 containerships for American President Lines, and also provides hardware, software, and support services to Pacific-Gulf Marine of New Orleans.

For further information on HWW and its operations,

Circle 45 on Reader Service Card

Parkway Adds Improved Features To Its Ocean Jacket Buoyancy System

Parkway Systems recently introduced several new features in its total buoyancy compensator (BC) system, the Ocean Jacket, providing divers with maximum comfort and performance.

The inflator hose and O/P valve have been moved to the top of the shoulder for better access. Inflator and quick-dump valve controls remain closely grouped for one-hand operation. The shoulders have a new contour shape for comfort and mobility, and a new Fastex® buckle has been added to the chest strap for easy snap-on. The system provides 44 pounds of lift.

Like all Parkway BCs, the Ocean Jacket can be inflated orally or with CO_2 detonator, and includes the Softouch™ power inflator. The oral inflation hose now incorporates the QD valve for extra convenience. The Ocean Jacket has Parkway's specially designed, 15-mil polyurethane zip-out bladder to balance air and distribute buoyancy.

The jacket is made of rugged 430-denier nylon with reinforced seams. Other features include Velcro-fastened tabs to hold regulator, octopus, and gauge hoses out of the way, and self-draining pockets. Color is blue with silver trim.

For more information on this and other Parkway equipment,

Circle 15 on Reader Service Card

WABCO To Market New High-Torque Air Motor — Literature Available

WABCO Fluid Power of Lexington, Ky., a division of American Standard Inc., has announced an agreement with Tachyon Corporation of Minneapolis to develop jointly and to market worldwide an improved low-speed, high-torque fractional horsepower air motor.

The new air motor, based on Tachyon's patented Gerotor features, is designed to produce air-powered rotary motion in many marine, industrial, mobile, and petroleum applications.

In addition to manufacturing industrial products, American Standard is a leading producer of railway mass transit and automotive braking and control devices, plumbing and other building products, earth- and ore-moving vehicles, bank security systems, and graphics products. The company and its affiliates carry on manufacturing operations in more than 20 countries.

For further information and free literature on the new air motor,

Circle 94 on Reader Service Card

Warren Pumps Division Of Houdaille Industries Acquires Pyroite® Lines

Frank Standish, president of Warren Pumps Division of Houdaille Industries, Inc. Warren, Mass., has announced that Warren has acquired the Pyroite® pump lines of Plastonics International, Inc. of Avon, Ohio. The lines consist of horizontal and vertical centrifugal pumps and vertical turbine pumps, all of which are manufactured of Pyroite, a patented reinforced composite.

Pyroite material, according to Mr. **Standish,** is a space-age, versatile engineering resin that provides the exceptional structural strength of composite with the corrosion and erosion resistance of an exclusive resin to handle 97 percent of all corrosive and erosive liquids at temperatures to 500 F (260 C).

Production will commence at Warren's main plant shortly, and an inventory of pumps and parts is now available at the Massachusetts facility.

Circle 44 on Reader Service Card

Hempel's Introduces New Antifoulings — Literature Available

A new approach to non-polishing antifoulings—a product area many sources estimate accounts for at least 85 percent of the total world market for antifoulings—was announced recently by Hempel's Marine Paints A/S.

Through half a century of research and development of traditional, non-polishing antifoulings, Hempel's has gained a thorough understanding of the effects of antifoulings. It is this know-how that now enables Hempel's to introduce, under the name Classic, a new optimized range of these traditional coatings.

The Classic range consists of four products: antifoulings 7611, 7633, 7655, and 7677, which together cover the full non-polishing spectrum by taking into account the degree of protection required by individual vessels for their particular trading pattern, activity level, and desired drydocking interval.

The versatility of the Classic range, through combining the products' variable film thickness and coating sequence abilities, provides no less than 13 alternate specifications. This, together with the easy to follow selection table, not only allows the shipowner the widest choice, but enables him to recognize and choose the optimum non-polishing system for each individual vessel.

For further information and a free 12-page color brochure on the Classic antifoulings,

Circle 16 on Reader Service Card

Circle 150 on Reader Service Card ►

Cybernet introduces the music hour.

Presenting the marine entertainment center that's filling boats all across America with glorious stereo sound.

Cybernet proudly introduces a superb stereo entertainment center for your boat at a price hundreds of dollars less than any other top of the line marine stereo. This fully marinized system contains a PLL quartz synthesized AM-FM stereo receiver with digital tuning and automatic scanning, an auto-reverse cassette deck with Dolby® NR circuitry and an impressive 36 watts of audio amplification.

At only 3" high by 7½" wide, this full feature stereo is compact enough to fit in any boat's control console, even a tiny runabout, yet you get amazingly big multi-speaker stereo sound. In fact, there's enough power to provide high fidelity stereo in two separate areas aboard with three-way speaker selection.

For years of reliable operation in rugged marine service, the CMS-3000 boasts a weatherproof fully o-ring sealed case, and a unique closed-door cassette player for added protection against salt water and corrosive dampness. The fully enclosed two-way speaker systems have weatherproof plasticised cones for reliable performance at sea.

Cybernet's stereo entertainment center is undoubtedly the marine electronics Product of the Year, so you'll almost surely see it at your dealer. If not, write Cybernet International, Inc., 7 Powder Horn Drive, Warren, NJ 07060 for full details and your nearest authorized CMS-3000 dealer.

USS Ticonderoga

Navy Repair And Overhaul Market

James R. McCaul, President
International Maritime Associates, Inc.

The Navy has clearly become the dominant source of ship repair, as well as new ship construction in the United States. Ten years ago Navy business accounted for 36 percent of ship repair employment and 58 percent of new ship construction employment in U.S. shipyards. The figures are now 78 percent and 87 percent, respectively (see Exhibit 1).

In June 1983, IMA published a report on the Navy new construction market. A second report, on the Navy repair and overhaul market, is now being prepared. Some information to be presented is highlighted in this article.

Exhibit 1
Significance of Navy Work
To U.S. Shipyards
(data as of Oct. 83)

	Total Production Workers	Production Workers in Navy Repair	Navy As % of Total
Atlantic	10,361	8,642	83
Gulf	3,844	2,570	67
Pacific	2,180	1,748	80
Great Lakes	234	0	0
Total	16,619	12,960	78

	Total Production Workers	Production Workers In Navy New Construction	Navy As % of Total
Atlantic	44,782	41,685	93
Gulf	10,198	6,811	67
Pacific	9,531	8,090	85
Great Lakes	1,232	932	76
Total	65,743	57,518	87

Source: Maritime Administration

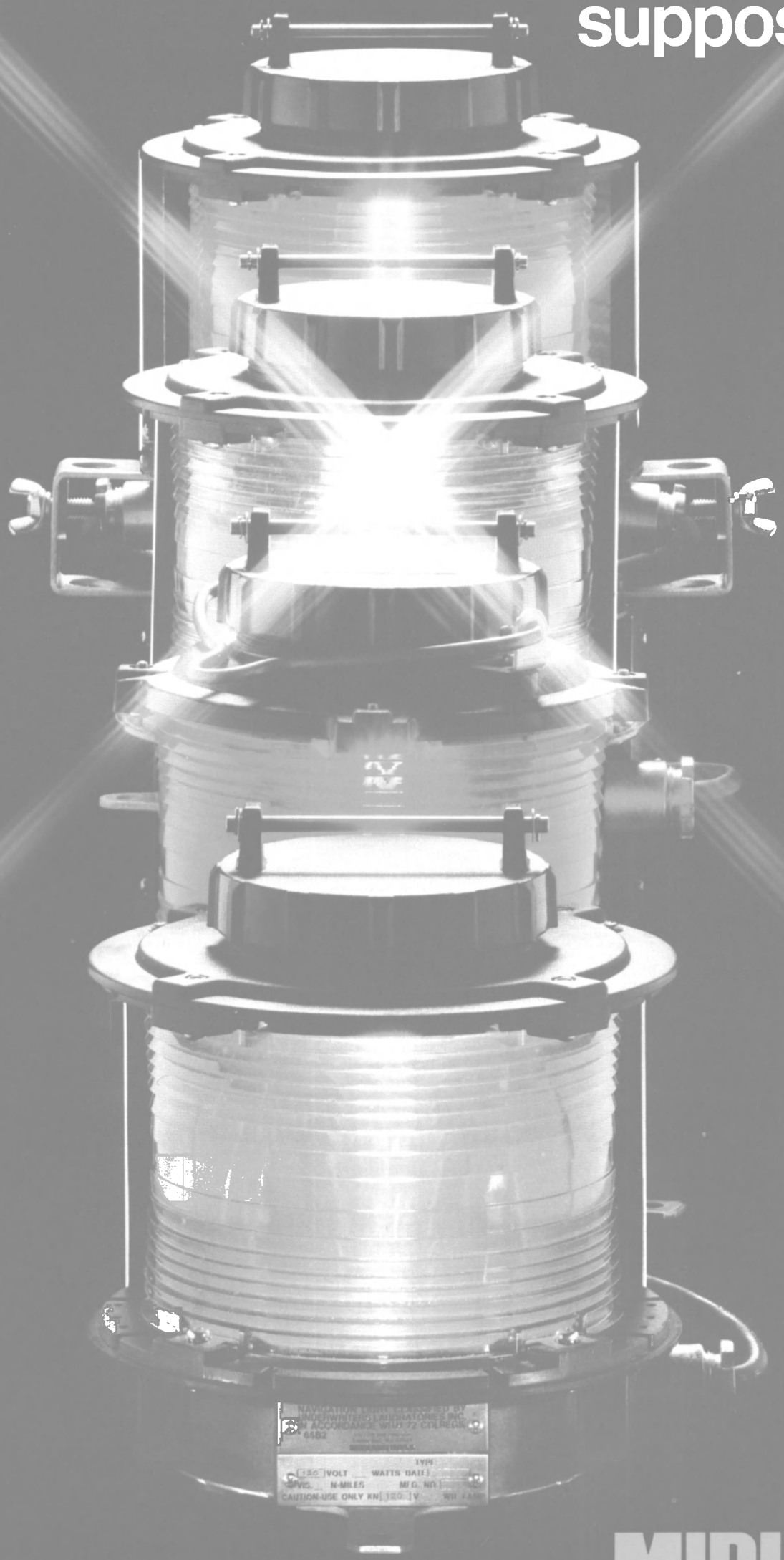
Future Business Opportunities

The Navy has asked Congress for $2.8 billion in FY 1985 to fund 56 scheduled Navy ship overhauls. This compares to $2.4 billion for 54 overhauls in FY 1984, and $2.5 billion for 59 overhauls in FY 1983.

Past policy has been to assign about 35 percent of this work to private shipyards. The remaining

(continued on page 38)

The Long Life Lite™ from Russellstoll. Because we don't think lamps are supposed to break.



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.

U.L. listed in accordance with 72 COLREGS.
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.

See the light.
Start saving money. Get the Long Life Lite at your local Russellstoll Marine distributor, or call your Russellstoll representative.

Midland-Ross Corporation
Russellstoll Division
530 W. Mt. Pleasant Avenue
Livingston, NJ 07039
Phone: 201/992-8400
Telex: 13-8403

MIDLAND ROSS

Circle 143 on Reader Service Card

Navy

(continued from page 36)
65 percent of the work, especially overhaul of complex combatants, is performed in one of eight Navy-owned shipyards.

Exhibits 2 and 3 list the scheduled overhauls of Navy and MSC ships over the next 12–24 months. Forty-nine Navy and 28 MSC ship overhauls are scheduled. These jobs are to be awarded to commercial shipyards.

There are constraints on the competition:

- Some have already been awarded as part of a multi-ship contract.
- To maintain crew morale, Navy's policy is to restrict competition on about one-third of overhauls to homeport shipyards. This policy doesn't affect MSC ships. But the ship relocation cost effectively limits Atlantic/Gulf shipyards to competing for Atlantic fleet MSC ships, and West Coast yards compete for Pacific fleet ships.
- NAVSEA and MSC are required to reserve some overhauls to competition among shipyards qualifying as small business firms. This particularly affects MSC overhauls as almost all are reserved for small businesses.

Equipment Sales

Each overhaul requires replacement or addition of equipment. An example of the equipment variety and planned expenditure is provided in Exhibit 4. This shows equipment required for scheduled alterations planned for USS Simon Lake, a 20-year-old submarine tender.

Most long lead time equipment is directly purchased by Navy and provided to the shipyard as Government Furnished Equipment (GFE). More common equipment (e.g., refrigerators, hydraulic bench press, etc.) are typically included in the specification as items to be purchased by the shipyard as Contractor Supplied Equipment (CFE). Our survey indicated a large percentage of mechanical, electrical and outfit equipment is purchased by the shipyard. Electronics equipment is purchased about evenly by Navy and contractor. Ordnance equipment is mostly purchased by Navy.

(continued on page 40)

Exhibit 3
MSC Scheduled Ship Overhauls

Ship	Date Work Planned	Fleet
AE 26	May 84	Pacific
AF 58	July 84	Atlantic
AGOR 7	Jan–Feb 84	Atlantic
AGOR II	Jan–Feb 84	Pacific
AGOR 12	Dec 83–Feb 84	Pacific
AGS 27	Feb 84	Atlantic
AGS 29	Jan 85	Pacific
AGS 33	Nov 84	Atlantic
AK 282	Oct 84	Atlantic
AK 284	Nov 84	Atlantic
AK 285	Dec 84	Pacific
AKR 7	Apr 84	Atlantic
AKR 10	Feb 84	Pacific
AKR 11	May 84	Pacific
AO 106	Jan 85	Pacific
AO 108	July 84	Atlantic
AO 109	June 85	Atlantic
AO 143	Mar 84	Atlantic
AO 144	May 85	Atlantic
AO 147	Oct–Dec 85	Atlantic
AO 148	Feb–Mar 84	Pacific
AOG 78	Feb 85	Pacific
ARC 2	Jan 85	Atlantic
ARC 3	Jan–Feb 84	Pacific
ARC 6	July–Sept 84	Pacific
ATF 169	Apr 84	Pacific
ATF 171	Nov 84	Pacific
AFS 10	Jan 85	Atlantic

Source: Military Sealift Command

Exhibit 4
Equipment Required for Alterations Planned In AS 33 Overhaul

Alteration	Projected Equipment Cost
Replace 02N2 plant	$575,000
Sprinkling system—heat detector, pneumatic valves	3,400
MK 12 AIMS installation	17,700
Oil water separator	153,700
Install AN/BRA control units	202,000
Crew galley refrigerator	3,900
Impressed cathodic protection	2,900
Install containerized inflatable lifeboat	502,100
Install TTY system	89,400
HF Mod XMTRS	230,500
AN/WSC-3 peripherals	216,800
Comm-CSS	28,200
Install Barton RWL Ind/W 1430	15,600
Tank demineralizer system	8,100
Install type I dehydrator	21,100
Dissolved oxygen analyzer	3,600
Morpholine injection system	1,900
Install salinity indicator system	52,600
Install superheater temp. indicator	5,500
Replace FWC system	27,700
CHT design improvement	33,600
Comm—SAS	167,000
Navy growth radio	553,100
50 ton hydraulic press, radial drill	9,900
Machine shop improvements	86,000
Electrical shop improvements	54,000
48" surface grinder, milling machine, etc.	309,500
Flexible hose equipment—pipe shop	20,000
MFP LO system modification	12,100
FDB lube oil system modification	163,600

Source: Naval Sea Systems Command

Exhibit 5
Ranking of Factors Which Influence Award of Navy Overhaul Contracts
(1 most important, 16 least important)

	All Respondents	Atlantic Shipyards	Pacific Shipyards
Quality assurance program	1	1	4
Drydocking capability	2	5	3
In-place management systems	3	3	5
Management experience in Navy work	4	2	6
Political support in Congress	5	7	1
Capability to manage combat system overhaul	6	8	2
Performance on previous Navy contracts	7	4	10
Data management capability	8	6	9
Available pier space	9	11	7
Subcontractor network	10	10	8
Strong financial position	11	9	11
Electrical shop capability	12	13	13
Machine shop capability	13	14	12
Small/disadvantaged business status	14	12	14
Available cranage	15	15	15
In-house engineering capabilities	16	16	16

Exhibit 6
Overhaul Problems
(1 most important, 11 least important)

	All Respondents	Atlantic Shipyards	Pacific Shipyards
Unrealistic bid pricing	1	1	1
Difficulty getting decisions from Navy	2	2	4
Delays in receiving GFM/GFI	3	6	2
Inspections, qualification and certification delays	4	3	3
Documentation inaccuracies	5	4	7
Payment delays and fee with holding	6	8	5
Time from contract to ship availability	7	9	6
Difficulty preparing response to RFP	8	5	10
DCAA audits and cost accounting standards	9	10	9
Providing crew accommodation/access to ship	10	7	11
Subcontractor unreliability	11	11	8

Exhibit 2 Navy Ship Overhauls Scheduled For The Private Sector During FY 1984–1985

Ship	Work Start Date	Type Contract	Procurement Contract Office	Notes
ARDM 1	Jan 85	Fixed Price	SupShip Charleston	
ARDM 4	July 85	Fixed Price	SupShip Boston	
AS 33	June 85	Fixed Price	NAVSEA 02	
DD 974	Oct 83	CPAF	NAVSEA 02	Awarded Ingalls
DD 979	Feb 84	CPAF	NAVSEA 02	Awarded Bath
DD 980	Oct 84	CPAF	NAVSEA 02	Awarded Coastal
DD 982	May 84	CPAF	NAVSEA 02	Awarded Coastal
DD 983	June 84	CPAF	NAVSEA 02	Awarded Ingalls
DD 987	Aug 84	CPAF	NAVSEA 02	Awarded Bath
DD 988	Feb 85	CPAF	NAVSEA 02	Awarded Ingalls
DD 989	Feb 85	CPAF	NAVSEA 02	Awarded Bath
DDG 46	Mar 85	Fixed Price	NAVSEA 02	
FF 1038	Feb 86	Fixed Price	SupShip Jacksonville	
FF 1056	Sept 84	Fixed Price	NAVSEA 02	Small Business Set Aside
FF 1059	Sept 84	Fixed Price	NAVSEA 02	
FF 1085	Nov 83	CPAF	NAVSEA 02	Awarded Coastal
FF 1089	Feb 84	Fixed Price	NAVSEA 02	Awarded Gen. Ship
FF 1092	Aug 84	NAVSEA	NAVSEA 02	
FF 1094	Mar 84	CPAF	NAVSEA 02	Awarded Coastal
FF 1095	May 85	CPAF	NAVSEA 02	Will be multiship
FF 1097	Nov 85	CPAF	NAVSEA 02	contract
FFG 5	Sept 84	Fixed Price	NAVSEA 02	
LKA 117	July 84	CPAF	SupShip Portsmouth	
LPD 1	Feb 85	Fixed Price	SupShip Portsmouth	
LPD 12	Aug 85	Fixed Price	SupShip Portsmouth	
LPD 14	June 84	Fixed Price	SupShip Portsmouth	
LSD 37	Jan 85	Fixed Price	SupShip Portsmouth	
LST 1180	June 84	Fixed Price	SupShip Portsmouth	
LST 1181	Apr 85	Fixed Price	SupShip Portsmouth	
MSO 443	Oct 84	Fixed Price	SupShip Jacksonville	
MSO 448	Jan 84	Fixed Price	SupShip Charleston	
AE 25	June 84	Fixed Price	SupShip San Francisco	
AE 29	July 85	Fixed Price	SupShip San Francisco	
AS 37	Jan 84	Fixed Price	SupShip San Diego	Awarded TAS
ASK 9	Sept 85	Fixed Price	SupShip San Diego	
DD 986	Nov 84	CPAF	NAVSEA 02	
FF 1053	July 85	Fixed Price	NAVSEA 02	Small Business Set Aside
FF 1069	May 84	Fixed Price	NAVSEA 02	
FF 1083	Jan 84	CPFF	NAVSEA 02	Awarded NASSCO
LPD 6	July 85	Fixed Price	SupShip Portsmouth	
LPH 10	Sept 85	Fixed Price	NAVSEA 02	
LSD 39	July 85	Fixed Price	SupShip Long Beach	
LST 1182	Jan 84	Fixed Price	SupShip Portsmouth	Awarded SD Iron & Steel
LST 1183	July 84	CPFF	NAVSEA 02	Awarded NASSCO
LST 1184	Feb 84	CPFF	NAVSEA 02	Awarded NASSCO
LST 1185	Feb 85	Fixed Price	SupShip San Diego	
LST 1189	Sept 84	Fixed Price	SupShip Portsmouth	Awarded NASSCO
LST 1198	Jan 85	CPFF	NAVSEA 02	Awarded NASSCO
IX 501	Sept 84	Fixed Price	SupShip San Diego	

Source: Naval Sea Systems Command

Navy

(continued from page 38)

About 30–40 percent of the cost of a typical combatant overhaul will be subcontracted by the shipyard for material purchase. A large integrated yard (e.g., Bath, Ingalls) will subcontract 2–5 percent for outside labor. Smaller yards may subcontract out 50 percent for specialized services.

Profitability of Navy Overhaul

We asked master ship repair contractors about the profits in Navy overhaul work. Of 22 responses:

- 9 respondents said Navy overhauls were less profitable than commercial repairs
- 11 thought the Navy and commercial repair business had comparable profits
- 2 said Navy was more profitable than commercial work

Of the 49 Navy ship overhauls scheduled for the private sector over the next two years:

- 31 will be fixed-price contracts
- 14 will be cost-plus-award-fee contract
- 4 will be cost-plus-fixed-fee contracts

Fixed-price contracts squeeze profits from bidders in an industry hungry for work. U.S. ship repair

Exhibit 7
Planned Improvements in Capability

	Number of Responses
No significant improvements needed	5
New drydocking facilities	13
Improved machine shops	11
Electronics tests and repair facilities	7
Data processing equipment	6
Expanded engineering staff	10

yards are increasingly hungry for work! It is highly probable that Navy overhaul will be a low profit business over the next few years.

Technical Competitive Factors

We asked master ship repair contractors to rank technical factors which affect award of Navy overhaul contracts. Exhibit 5 shows the response of 22 shipyards.

A peculiar pattern appears in these responses. Atlantic yards give high ranking to quality assurance, management experience in Navy work, in-place management, and previous performance on Navy contracts. Important factors to Pacific yards are political support in Congress, combat systems capability and drydocking capability.

Problems in Navy Overhaul

Shipyards were also asked to rank problems in performing Navy overhaul work. Exhibit 6 shows the response.

All yards felt unrealistic bid pricing is the greatest problem. Many said competition is cut-throat. This reflects the state of shipyard business and reliance on a small number of big jobs from one customer.

Pacific coast yards seem to have particular problems receiving GFM/GFI, but less difficulty getting decisions from the Navy.

Yard Improvements Planned

We asked what type improvements each yard plans in overhaul and repair capabilities over the next several years. Exhibit 7 shows the response.

Over half the respondents said they are planning new drydocking facilities. A large number said they plan to improve machine shops and expand their engineering staff.

IMA's full report (about 200 pps.) on the Navy overhaul market will be available in May 1984. It will be sold for $480. This price includes the initial report plus four quarterly updates. The report can be obtained by writing: ***James R. McCaul,*** *President, International Maritime Associates, Inc., 1800 K Street, N.W., Washington, D.C. 20006.*

A special pre-publication price of $380 is available to purchasers of the report who order prior to May 1.

Volunteer Barge Moves To New Office Facility On Cumberland River

Volunteer Barge & Transport, Inc. has established new offices in Nashville, Tenn., at Hailey's Harbor-mile 180 on the Cumberland River. Its marine management operations will be better situated near its primary source of trade on the Cumberland River and inland waterways.

Richard Hommrich, president, announced that his expanded services will include development of through transportation including terminal services in Nashville and other river ports, operation of boats and barges, and towing. The new phone number is (615) 256-0073.

Furuno Unveils Low-Cost Color Video Plotter — Literature Available

Furuno-qualty color plotting is now available for the smaller vessel with the GD-200 color video plotter. Based on the company's well-proven, computerized plotter control system, the GD-200 uses a high-resolution, low-cost color monitor to display a visual readout of own ship's course and navigation marks in seven owner-selectable colors.

The new unit offers many traditional Furuno video plotter features: accepts navigation inputs from Loran, satnav, or Omega; electronic selection of chart scale (from ⅓ mile square to 56,000 miles square); shifting of the entire display in any direction; and digital display of major system parameters on the CRT.

A bright, 14-inch CRT facilitates navigation, fishing, and other marine activities. Both true and relative motion display modes can be selected, and even individual courseline segments can be shown in different colors. A total memory capacity of 1,500 points is provided, and a built-in battery protects stored information. Even fairways and coastlines can be shown by interconnecting event marks. Up to 10 identified waypoints and a destination can be entered.

For further information and free literature on the GD-200,

Circle 25 on Reader Service Card

Vitro Awarded $8½-Million Navy Contract For System Integration Engineering

Vitro Corporation, Silver Springs, Md., has been awarded an $8,577,280 cost-plus-fixed-fee Navy contract for providing 284,050 man-hours for the system integration of the Tartar DDG/CGN and MK 92 FFG-PHM programs, including production engineering service. The Naval Sea Systems Command is the contracting activity.

MarAd To Host Fleet Management Conference April 25–27 In Chicago

The Maritime Administration will host the 1984 Fleet Management Technology Conference at the Sheraton Plaza Hotel in Chicago, Ill., April 25–27, 1984.

It will be the fifth annual conference of the FMT Program, which has been established to improve productivity, profitability, and the competitive position of U.S. water transportation companies through application of advanced computer/communications technology.

Among the presenters at the 1984 conference will be ocean carriers, inland waterway operators, and carrier associations. Representative topics for presentations and panel discussions will include operations planning, shipboard computer applications, vessel energy conservation, strategic planning, ship-to-shore communications, intermodal equipment control, electronic data interchange, and shipboard personnel training.

Keynote speaker at the two-and-a-half day conference will be **Howard A. Watters,** Deputy Maritime Administrator for Inland Waterways and Great Lakes Maritime Administration.

Luncheon speakers are, on April 25, **James L. Emery,** administrator, St. Lawrence Seaway Development Corporation, and on April 26, **Peter J. Finnerty,** vice president, Public Affairs, Sea-Land Industries, Inc.

For a copy of the full agenda, along with a conference registration form as well as additional information on the conference, contact **Joedy Cambridge** at Simat International Ltd., 729 Fifteenth Street, N.W., Washington, D.C.; (202) 628-4747.

Harriet Harrison Elected To AWO Region Three Board Of Directors

Harriet Harrison

Harriet Harrison, president of Koch-Ellis Marine, has been elected to the board of directors of Region Three of the American Waterways Operators, Inc.

She joined Koch-Ellis in 1973 as a bookkeeper, and by 1979 had become president of the company. Since that time, the company's principal business of ship bunkering has grown, and now has an office in Houston as well as in the main office in New Orleans.

In 1982, Mrs. **Harrison** bought out a Louisiana neighbor, Barge and Ship Service located at mile 104 on the Mississippi River. Since the Koch-Ellis diversification, this steaming, gas-freeing, and wet dock facility has added a new RO/RO-container cleaning operation, with more services contemplated for the future.

Spring Meeting Of Great Lakes/Great Rivers SNAME Scheduled For May 17

The Spring Meeting of the Great Lakes and Great Rivers Section of The Society of Naval Architects and Marine Engineers will be held May 17 at the Quality Inn Riverview in Covington, Ky.

The theme of this meeting will be oriented to "Rivers," and the following papers will be presented: "Maneuvering on the Rhine and Model Test Work for European Vessels," by **Gurdip K. Lauthra;** "Survey Paper on Oily Wastewaters," by **C.T. Warinner** and **David Woifard;** "Design and Construction of the MV G.W. Gladders," by **C. VanMook;** "Midland's Heavy Fuel Oil Experience," by **Kenneth Siegmann;** "Conceptual Application of Steam in River Towboats," by **Fred A. Prahl III**.

An afternoon panel discussion on "Future Outlook of Fuel" will be chaired by **C.J. Santavicca**. Panelists will include **Ronald E. Brown, Steven Mulvaney,** and **Roger E. VanDuzer**.

For additional information or advance registration, contact **Thomas Mackey** of Hyde Products, (216) 871-4885, or **Michael Dills** of Freshwater Press (216) 241-0373.

Circle 14? on Reader Service Card ►

Magnetrol Offers Brochure On Electronic Liquid Level Transmitters

Magnetrol International, Inc. of Downers Grove, Ill., a leading manufacturer of a broad range of level and flow control products and technologies, has available a free color brochure on its Modulevel EZ Series electronic level transmitters.

These advanced two-wire instruments utilize Magnetrol's buoyancy-magnetic coupling principle to detect and convert liquid level changes into a stable 4-20 milliampere output signal. The magnetic coupling bond between the level-sensing element and output electronics greatly simplifies mechanical design and construction. The vertical configuration of the transmitter reduces instrument weight and simplifies installation, and the electronics enclosure may be easily positioned to face any direction.

For further information and a free copy of the brochure,

Circle 87 on Reader Service Card

American Metal Bearing Offers Free Literature On Products/Services

American Metal Bearing Co. recently published a new color brochure, "Excellence in Bearing Design and Manufacture." The eight page brochure outlines the product lines, design and manufacturing methods, experience, and client list of American Metal Bearing Co. The firm has been manufacturing and maintaining large bearings for ship propulsion systems and industrial uses since 1921. The company now offers a comprehensive service to shipbuilders, shipping companies, and navies, designing, building, and maintaining complete, fully-integrated, propeller shaft bearing systems.

For a free copy of the brochure,

Circle 39 on Reader Service Card

Sperry Awards Sanders $10-Million Contract

Sanders Associates, Inc., has been awarded a $10-million subcontract by Sperry Systems Management, Great Neck, N.Y., to provide Auxiliary Display Terminal (ADT) equipment for the U.S. Navy's Trident II navigation subsystem development program.

The ADT's will provide the keyboard entry and display capability for monitoring the Trident II's navigation subsystem performance and will also be used during maintenance and training operations. The award involves development of Trident-unique hardware and software interfaces, qualification testing, delivery and field and factory support through 1988.

The ADT is an adaption of Sanders recently developed MILIGRAPHIC Display System, a militarized intelligent raster graphic display terminal with dual microprocessors, derived from Sanders/CalComp VISTAGRAPHIC displays.

Sperry has also ordered VISTAGRAPHIC™ units for software development at Sperry and other navigation subsystem subcontractors in preparation for receipt of the Auxiliary Display Terminals.

Sanders Associates, Inc. is engaged in the design, development and manufacture of advanced systems and components for the defense electronics and computer graphic markets.

Adams & Porter Moves To New Offices In Houston

Adams & Porter Associates, Inc. Houston, has moved its operations and staff to a new building located at 510 Bering Drive, Houston, Texas 77057. The new telephone number is (713) 975-7500.

Adams & Porter Associates, Inc. is a Houston-based international brokerage company founded in 1907.

William Gaylord Appointed Vice President At Anixter

William Gaylord

William Gaylord has been appointed vice president-Defense and Aerospace Industries, for Anixter Bros., Inc., it was announced by **James Warren,** vice president of National Accounts.

In his new position, Mr. **Gaylord** will direct Anixter's sales and marketing program for the aerospace and defense industries nationwide. He will operate out of Anixter's San Francisco wire and cable distribution center.

Anixter operates an international network of electrical and electronic wire and cable service centers.

Shown at joint meeting of three technical societies in Los Angeles are (L to R): **Max Cheung,** chairman, SNAME; **Bill Watts,** public relations, SNAME; **Chuck Chamberlain,** vice chairman, MTS; **Kathleen King,** chairman, MTS; **Dan Friedman,** author; Capt. **Charles Niederman,** ASNE; and **Herb Chatterton,** Spring Meeting Committee, SNAME.

Joint SNAME/ASNE/MTS Meeting Hears Paper On Offshore Platforms

The fourth meeting of the 1983–84 season of The Society of Naval Architects and Marine Engineers Los Angeles Metropolitan Section was held aboard the SS Princess Louise I. Some 100 members and guests attended this joint meeting with the American Society of Naval Engineers and the Marine Technology Society. Prior to the technical portion of the evening, each organization provided news and announcements.

The guest speaker at the meeting was **Dan Friedman,** vice president and general manager of Fluor Offshore Services of Irvine, Calif. His presentation, accompanied by slides and movies, was titled "An Update of the Offshore Platform Industry."

Mr. **Friedman** began with a chronology of offshore oil drilling developments beginning in 1896. Drilling and production offshore southern California began early in this century utilizing trestles and crude wood pile structures in very shallow water. Pictures were shown of a few of these early platforms.

The author then reviewed some aspects of current technology. Conventional steel jacket structures, steel and concrete gravity-based structures, and floating platforms were examined. Deepwater applications also were discussed, including tension leg platforms, Exxon's guyed tower, and fixed buoyant towers. Methods of problem solving are important in developing the more recent applications. These include model testing, full scale empirical data, and new metallurgical information. He stressed the use of computer design tools such as three-dimensional frame analysis, environment loads dynamics, and fatigue analysis.

Mr. **Friedman** concluded by showing two interesting films. The first covered the deployment of CONOCO's barge-launched jacket structure in 500 feet of water at the Murchison Field in the North Sea. The second film showed the construction in Norway and towing of a 200,000-ton concrete, gravity-based production platform destined for the Frigg Field in 200 feet of water.

Sperry Awarded $5 Million For Navy Long Lead Items And Engineering Work

Sperry Corporation, Electronics Division, Great Neck, N.Y., has been awarded $5 million to increase the limitation of liability to provide additional long lead time material and engineering development for the MK 92 phased-array radar. The Naval Sea Systems Command is the contracting activity.

ASNE Day '84

Technology In Engineering — Backbone Of Ship Design, Construction And Repair

Washington, D.C. — May 3–4

The American Society of Naval Engineers will present ASNE Day 1984 with the theme "Technology in Engineering—Backbone of Ship Design, Construction, and Repair." ASNE Day is the Society's annual national convention with technical sessions, exhibits, and social functions. It will be held May 3 and 4 this year at the Shoreham Hotel in Washington, D.C.

The meeting is climaxed by the banquet on Friday evening, May 4. This year's banquet speaker will be Vadm. **Robert L. Walters,** Deputy Chief of Naval Operations, Surface Warfare.

More than 100 companies, military commands, and other organizations will display their products, services, and capabilities. These exhibits will portray the latest technology that supports the development, building, and outfitting of commercial and military shipping. Also represented will be organizations that interface with the industrial community and direct the programs and projects engaged in modernizing and updating the U.S. Navy Fleet.

The luncheon speaker on May 3 will be Commodore **Grace M. Hopper,** USNR, the Navy's own pioneer of modern computer technology and the inventor of the computer language COBOL. Her presence will constitute a milestone in the annals of the Society, as she is thought to be the first woman speaker in ASNE's history.

Technical Program

The two-day meeting will include technical papers selected by the Committee from among the many submitted for presentation. They will cover subjects of current interest including ship design, combat systems, ship acquisition and modernization, ship auxiliary systems, hull coatings, hull designs, and ship propulsion.

Thursday, May 3

Palladian Room—Session 1A

Ship Acquisition and Modernization

Moderator:

Radm. **James W. Lisanby,** USN (Ret.)

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

9:00 a.m.

"Design of Modernized Battleships and Cruisers," by **Philip J. Sims, James F. Edwards Sr.,** LCdr **Robert L. Dickey,** USN, and **H.S. Shull.**

In recent reactivation studies of battleships and cruisers from the reserve fleet, the Navy faced three major problems: the baseline data on the ships was not readily available or could not be assured to be reliable; a new generation cruise missile armament was proposed; and the ship delivery schedule was very tight. After doing a feasibility study for a particular ship system, design engineers were taken on board the mothballed ship to resolve the design problems.

Being on the ship allowed an intensive effort and immediate reference to the actual ship configuration. The tools used to control this effort were a ship check plan, a ship form, and the master arrangement drawing. Simultaneously with the design effort, the repair effort was scoped. The design evolution and solutions to the major problems are described in

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Grumman/TANO: Two experts working toward one goal.

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ASNE Day

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this paper. The results of the New Jersey effort are shown, with sample documentation, the ship characteristics, and the downstream design effort.

9:45 a.m.

"The Ship Characteristics and Improvement Board—A Status Report," by **Stuart Williams.**

On September 7, 1982, Adm. **W.N. Small,** the VCNO, signed a memo establishing the Ship Characteristic and Improvement Board (SCIB). This memo ended months of deliberation between NAVSEA, NAVMAT, and OPNAV on how ship characteristics should best be developed and approved for both ship acquisition and fleet modernization programs.

By tracing the history of characteristics decision-making for naval ship programs, this paper establishes the foundation of the present SCIB. Organizational elements of the SCIB, including the functions of its permanent staff and working groups, are explained, and the recent track record of the SCIB on various programs is reviewed. Based on its first full year of operation, an overall assessment of SCIB performance and a projection of future efforts is made.

10:30 a.m.

"A Comparison of Naval Ship Design Procedures in the U.S. and Canada," by LCdr. **James D. Ertner,** USN, and Cdr. **W.A. Tyler Cassedy,** USN.

A synopsis of Canada's unified (combined Army, Navy, and Air Force) defense organization and decision-making structure is presented. This is followed by an explanation of the closely intertwined Program Management and Life-Cycle Management Systems, and their relationship in the Canadian ship design process. Next, U.S. Navy ship design procedures, including recent changes in program initiation procedures and creation of the SCIB, are viewed. Finally, the Canadian Department of National Defense and the U.S. Navy's design and acquisition processes are compared.

Diplomat Room—Session 1B

Ship Auxiliary Systems

Moderator:
Capt. **George M. LaChance,** USN
LCdr. **Kenneth M. Smith Jr.,** USN, assistant

9:00 a.m.

"Evolution of Navy Ship Sewage Systems—Gravity Through Vacuum Collection," by **Milton W. Raupuk Jr.**

Most U.S. Navy ships have sewage collection, holding, and transfer systems that use conventional gravity-flush fixtures and a seawater flushing medium. This type system is relatively simple but is inherently heavy and bulky, and is totally dependent of shore support when used in port. Some recently designed Navy ships, the DD-963 and DDG-993 Classes, employ a vacuum collection, holding, and transfer system (VCHT) that uses reduced-volume flush commodes and urinals with either fresh water or seawater flushing and vacuum for waste transport. This system is light, compact, highly shore-independent, and provides significant system design flexibility.

This paper traces the evolution of Navy shipboard sewage systems from the original gravity collection system through the DD-963 Class VCHT system that used vacuum pumps, to a new and promising vacuum collection system that uses a sewage-powered eductor.

9:45 a.m.

"FFG-7 Class Fin Stabilizer System," by Cdr. **John C. Donahue,**

USN, **Edward J. McMahon,** and **Louis W. Nelson.**

This paper discusses the new fin stabilizer system developed for the FFG-7 Class ships, and includes a brief history of fin stabilizers, advantages of fin stabilizers on Navy combatants, brief theory of system operation, approaches used in system acquisition and vendor selection, and an up-to-date status of the program.

10:30 a.m.

"Experience With Reverse Osmosis Desalination Aboard USS Fletcher," by **Wayne L. Adamson, Joseph F. Pizzino,** and **Wilbur L. Smith.**

As part of a program to develop reverse osmosis (RO) desalination systems for shipboard fresh water production, the David Taylor Naval Ship R&D Center worked with NAVSEA to install a 12,000 gallon per day, two-stage RO plant aboard the USS Fletcher (DD-992) in 1981. The first stage provides potable water (less than 500 parts per million total dissolved solids) for crew needs; the second stage provides high-purity water (less than 2 parts per million of total dissolved solids) for boiler makeup. The plant has been producing acceptable water quality and quantity despite some materials-related problems. The system design has proven to be well suited for minimizing manning and maintenance requirements.

Palladian Room—Session 2A
Ship Design

Moderator:
Peter A. Gale
Susan M. Lee Bales, assistant

2:30 p.m.

"Technical Evaluation of the SES-200 High Length-to-Beam Surface Effect Ship," by **John D. Adams** and **W.F. Beverly.**

The requirement to operate surface effect ships (SES) efficiently at task force speeds without compromising their advantage of operating at higher speeds has been the subject of Navy research since 1970. These efforts showed that this could be achieved by selecting cushion length-to-beam proportions that place the high wave-making drag region known as "hump" outside the operating envelope. Vessels with these characteristics are designated "High Length-to-Beam SES."

This paper describes an extensive program undertaken by NAVSEA to validate this research and demonstrate high length-to-beam SES capabilities. Under this program, a 110-foot commercial SES was procured and stretched from a length-to-beam ratio of 2.65 to 4.25 by installing a 50-foot hull extension amidships. This vessel is the SES-200; it is the only large high length-to-beam SES in the world.

3:15 p.m.

"The CONFORM Program—An Update," by **Kenneth B. Spaulding Jr.**

This paper provides a progress report on the NAVSEA Surface Ship Continuing Concept Formulation (CONFORM) Program, first introduced to the Society at ASNE Day 1981 by Cdr. **Michael R. Terry,** USN. Since that time the program has produced many designs, achieved significant visibility and influence, and evolved in character. Designs and problem areas are summarized, and the future potential of the program discussed.

4:00 p.m.

"Combatant Ship Design Guidance Through Mission Effectiveness Analysis," by Dr. **Dean A. Rains.**

A combatant ship design technique is described that provides guidance for new designs and can assist in evaluating current designs and their revisions. The technique attempts to provide design evaluations by comparing competing designs in a mission performance context. For a selected mission, a number of ship alternatives are selected for study. Task groups are then selected to

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carry out the mission. The ship characteristics are determined to match each of the ship alternatives including size, first cost, and life cycle cost. Then the task groups are put through a simulated mission including enemy attack (defense by the group) and their offensive mission. The losses resulting from enemy action and the performance of the group in carrying out its mission are computed for the various enemy threats. Measures of effectiveness, both for the mission itself and the ship operating in a peacetime format, are then determined.

Diplomat Room—Session 2B
Combat Systems I

Moderator:
Radm. **John D. Beecher,** USN
Como. (Select) **Lowell J. Holloway,** USN, assistant

2:30 p.m.

"Current Trends in Naval Data Handling Systems," by **Martin Wapner** and **Richard A. Fastring.**

The hand-wired, point-to-point cabling that has been the mainstay of data handling on naval ships is slowly but surely giving way to more advanced techniques that include data bussing and high-speed switching networks.

The Navy's AN/USQ-82(V) Shipboard Data Multiplex System (SDMS) is now installed and operating for technical and operational evaluation purposes on USS Oldendorf, a DD-963 Class destroyer. The distributed switching system SITACS introduced at ASNE Day 1982 has now been breadboarded. In the foreign arena, NATO standard bus-network interfaces are being implemented in Norwegian, United Kingdom, and Canadian shipboard systems. These developments are reviewed and projections are made regarding future trends in naval data handling systems.

3:15 p.m.

"Application of Fiber Optic Technology to Combatant Submarines: Near and Far-Term," by **Ronald A. Swain** and LCdr. **David C. Poyer,** USNR-R.

Transmission of multiplexed data by means of optical fibers—pulses of light, conducted through channels of glass—offers many advantages over conventional multiwire systems. Optical fiber is lighter, easier to run, cheaper to install, is fireproof and resists shock, and is inherently resistant to EMI and EMP. It has been proven in commercial use.

Responding to these advantages, the Navy has for several years funded programs to provide military specifications for fiber optic (FO) connectors, couplers, splices, penetrators, sources, and detectors. This effort is near its successful end, and the Service has recently approved the first operational shipboard system. A fiber optic bus will carry data in the Submarine Advanced Combat System to be installed in new ships of the SSN-688 Class submarine construction program.

4:00 p.m.

"Ship Combat System Simulation (SCSS)," by **Dennis R. Mensh.**

This paper will describe a combat system integration and analysis tool called the Ship Combat System Simulation (SCSS), which was designed as an analysis tool to study Sensor, Command and Control, and Weapon System Integration for shipboard combat systems. The simulation represents the combat system components as nodes in a network. The nodes are connected by links. Data flows between the nodes through the links.

The SCSS is a structured program simulation written in Simscript II.5. The structured pro-

gram feature allows for ease of combat system reconfiguration into different types of architectures. Consequently, SCSS can be used to study and analyze different combat system architectures.

Friday, May 4

Palladian Room—Session 3A

Combat Systems II

Moderator:
Radm. **Wayne E. Meyer,** USN
Como. (Select) **Lowell J. Holloway,** USN, assistant

9:30 a.m.

"The New Jersey-Tomahawk Story: From Retirement to Renaissance—A New Strike Capability," by **Gerald R. Bell.**

This paper examines the adaptation of the Tomahawk System for installation in New Jersey (BB-62). The design modifications have been particularly critical, as the Baseline System is currently under development in USS Merill (DE-392). Urgent Navy requirements dictated the Battleship-Tomahawk effort overtake and lead the Baseline development in Merrill. Emphasis in this paper is placed upon discussion of planning, implementation, problems encountered, and the advanced capabilities surrounding New Jersey as a result of installing the Tomahawk weapons system.

The paper concludes with a discussion of the potential operational utilization of New Jersey in the strike warfare role that was lost to the surface Navy in World War II, when aircraft carriers supplanted battleships as the Navy's main strike arm.

10:15 a.m.

"Detection—A Modern View," by **Robert T. Hill.**

Over the past 10 years or so, the Navy in its surface combatants has introduced a modest amount of sensor integration and automation, improving in several ways the "detection" function of the "detection-control-engagement" trio of functions embraced by the combat systems. After a review of the basic ideas of this integration, the further increases in inferential power that can be provided by application of several emerging technologies to a fairly broad sensor base, including that of the force, are presented. The technologies include multi-sensor operations and netting, far more use of *a priori* information, more inference from present signal processing, new signal processing, and the new computer circuitry, architecture, and programming fields frequently discussed today. The paper concludes with a discussion of a possible way to proceed to improve systems, considering that we cannot "stop and start over" in much of our sensor system design in the major combatants.

11:00 a.m.

"Rationale for an ADA Software Engineering Environment for Navy Mission Critical Applications," by **Robert A. Converse** and LCdr. **Kathleen Paige,** USN.

This paper describes the lessons learned about computer program development over the past 25 years, and discusses a software engineering process that addresses these lessons. It then describes how ADA and its related ADA Programming Support and Run-Time Environments foster this software engineering process to improve computer program productivity and achieve greater system reliability and adaptability. Finally, the paper discusses how the use of ADA and its environments can enhance the interoperability and transferability of computer programs among Navy projects, and significantly reduce overall life cycle

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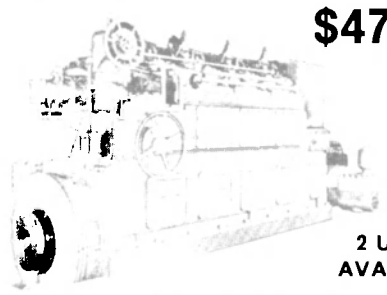

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NEW - UNUSED EX - U.S.N.

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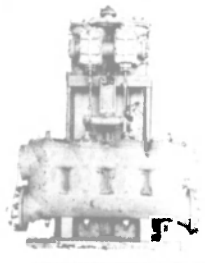
2½ KW—115 volts single phase A.C. output. GENERATOR: Type GNA—class IG— Frame 28A—Form A—1800 RPM—5 KVA—2.5 KW 115 volts AC— 60 cycle —50% PF—43.4 amps. MOTOR: Louis Allis—Type GNA—Class E—Frame 25A—Form A—1800 RPM—115 volts DC—32 amps—shunt wound (with attached Ward-Leonard frequency regulator).

CAN FURNISH WITH 230 VOLT DC INPUT

UNUSED STEAM WINCH FOR MOORING & CARGO SERVICES

Lidgerwood 10 x 12 — with Morse controls. 10,000 lb. line pull — declutchable gypsy — hand compression brake.

WORTHINGTON 16" X 14" X 18" VERTICAL DUPLEX STRIPPING PUMP

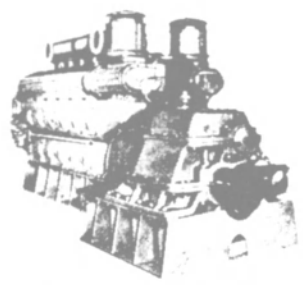


1400 GPM @ 110 PSI — suction lift 11.5 ft. — steam back pressure 15 lbs. 14" Suction —10" discharge — 2½" steam — 4" exhaust. Overall width 6'8" — overall height 9'1½" — depth 3'9½". Wt. approx. 10,000 lbs

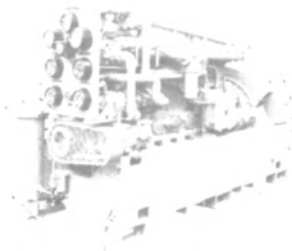
RECONDITIONED 1980 ABS — READY TO GO

MATCHED PAIR 900HP GM 12-567A DIESEL ENGINES

WITH FALK REVERSE AND REDUCTION GEAR



ENGINE: GM 12-567A—8½ X 10—V-type—2-cycle—747 RPM — electric starting. GEAR: Falk AirFlex — reverse & reduction — 2.48:1 forward — 2.52:1 reverse.



100KW GBD-8 DIESEL GENERATORS

From LST vessels. 120/240 VDC — 417 amps — stab. shunt — 1200 RPM — Delco gen. — self-excited. ENGINE: Superior GBD-8 — 8 cyl. — 5½ x 7 — 150 HP — 30 volt electric starting. Dry wt. 10,000 lbs. OAL 124" — 65 11/16" high — 42" wide. Ht. necessary to pull pistons 68". Fuel consumption 0.620 lbs/hr. 6 Available.

SPECIAL $4,500 EA.—6 FOR $25,000

DELAVAL MODEL 65-N-13 OR 65-N-23 FUEL OR LUBE OIL PURIFIERS — RECONDITIONED

2HP 440/3/60/1750 RPM motors.

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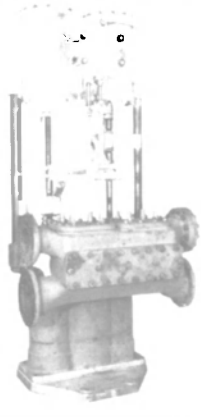
EX-LST ROSS COOLERS

Copper shell - bronze heads -5/16" Cupro tubes.

- 2 Model 1596
- 2 Model 1566
- 2 Model 860



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.

NEW STEEL HATCHES A

(SEE OUR CLASSIFIED AD

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

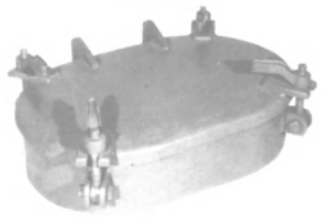
20" ROUND HATCH

18" Coaming — 3 brass dog drop bolts. Coaming 12mm thick — top 11mm. Bosmet #68

QUICK-ACTING 4-DOG HATCHES

Heavily constructed. Handwheel operated. Handwheels top & bottom. Size A: 27" x 21" w/12mm coaming & 11mm top. Size B: 31" x 31" w/12" coaming. For ocean-going barges, tugs, etc.

GENERAL PURPOSE HATCH



15" X 23" X 5" WITH 4 STEEL DOGS

TAN EXPANSIC

36" Diameter — 26 drop-bolts. Drawing

CARGO

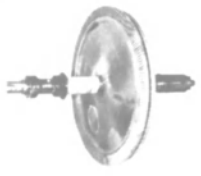
69" x 75" x 12"
72" x 74" x 12"

QUICK-OPEN

Handwheel top & b 24" with 5" coaming

QUICK-A LEVER O 26" WATER DOO

UNUSED E-125 WESTINGHOUSE CARGO PUMP TURBINE ROTORS



Counterclockwise rotation. Rotation from governor end. Weighted governor type. Drawing 28F-249-81. Built 1961.

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FOR MORE DOORS)

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N TRUNK

coaming — 7-Dog
#36/26

HATCHES

48" x 48" x 9"
36" x 30" x 8"

ING HATCH

ttom. 4 Dogs. 16" x
Drawing #60-40

ACTING
PERATED
66"
TIGHT
ORS

REG. PRICE
$425
SPECIAL
PRICE
$288

21" I.D. MAN-WAY
3-DOG HATCHES

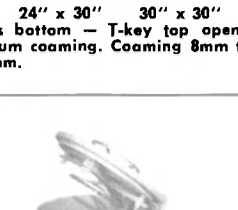
10" Coaming. Available with T socket wrench or removable handwheel (can be welded in place) for top opening. Coaming 12mm thick, top 11mm. Basmet #64/55

FLUSH HATCHES

24" x 30" 30" x 30"
4 Dogs bottom — T-key top opener. 4" Maximum coaming. Coaming 8mm thick — top 7mm.

25" ROUND HATCH

25" Diameter with 18" coaming. 4-Dog handwheel top and bottom. Quick-acting dogs. 11 mm x 12 mm steel.



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HATCH COVERS

Flush mounting watertight hatch with machined steel mounting ring. T-Handle is recessed and hand tightens against a strongback across mounting ring. Approx. weights, including mounting ring: 18" 60 lbs — 24" 100 lbs.

FACTORY NEW — UNUSED
MORRIS CAST IRON DREDGE
PUMP WITH EXTRA IMPELLER

10". End suction — top discharge. Cast iron impeller. Installation drawings and assembly drawings available. Type J bearing — Type JC pump.

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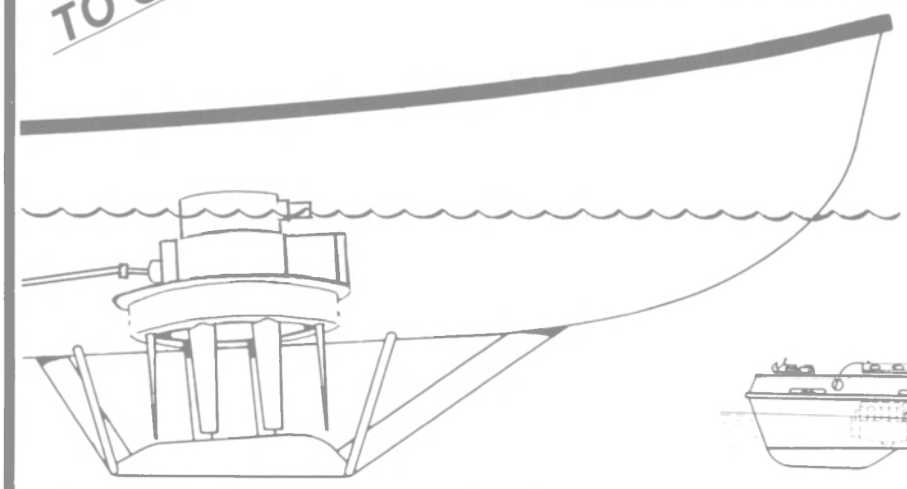

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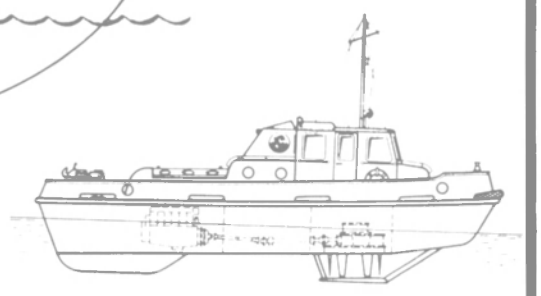
UNMATCHED RESPONSE



Serial Nos. NR-1783 and NR-1784. Unit size 24/E150. 6 Stainless steel blades each unit - 1500mm blade length -2400mm blade orbit diameter. PRESENT DRIVE with Voith AD40 reduction gears & heavy duty motor 800/1000 HP -440/3/60 - 1775 RPM - squirrel cage - 884 amps - frame 23153, Mfg. by Electric Machinery Co. Complete with "Cage Controls" & motor controls. Size 8 - Control volts 120 AC - line volts 450 - amps 941/3/60 OR DRIVE DIRECTLY WITH DIESEL ENGINE & HYDRAULIC COUPLING ARRANGEMENT. UNIT BUILT 1970. COMPLETE WITH HYDRAULIC SERVO MOTORS FOR BRIDGE CONTROL AND 5 SPARE BLADES.

CAN BE LOCATED SIDE-BY-SIDE, FORE AND AFT, FOR FAST AND PRECISE MOVEMENT SIDEWAYS AND 360° ON-AXIS TURNS, MAKING THEM IDEAL FOR TUGS, FERRIES, CRANES, ETC.

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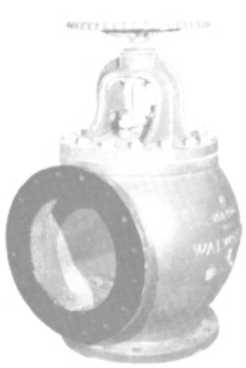
150 LB. DUCTILE IRON VALVES FROM EXXON TANKERS. MOST HAVE TEFLON SEATS AND BRONZE FITTINGS. GREAT OPPORTUNITY FOR REPAIR YARDS WITH RECONDITIONING FACILITIES.



ANGLE GLOBE VALVES

16" — $395
12" — $361
8" — $289
6" — $165

GATE VALVES RISING STEM

Teflon seats - bronze fitted. 16" OSY rising stem with clean-out pockets.

16" — $369
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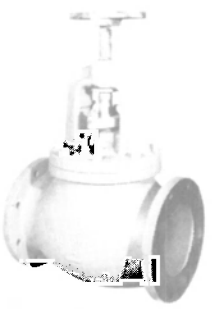
8" — $285
6" — $225
4" — $110

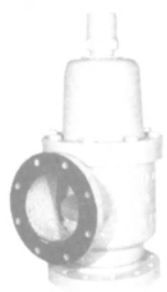
GATE VALVES NON-RISING STEM

Ductile iron - 150 lbs.
16" — $369

12" CHECK VALVE



8" GLOBE VALVE



8" RELIEF VALVE

MISCELLANEOUS LOT OF VALVES
CHECK - STOP CHECK - CARGO PUMP RELIEF VALVES

8" 1500 LB. GLOBE VALVES **$295**
12" 150 LB. GLOBE VALVES **$395**
8" CARGO PUMP RELIEF VALVE **$395**
12" CHECK VALVES **$695**

900 LB. HIGH PRESSURE VALVES

3" GLOBE VALVES **$360**
4" STEEL ANGLE VALVES **$495**
5" CRANE MAIN STOP VALVES **$695**
8" GATE VALVES **$560**

SURPLUS BALANCED HEAD FAIRLEADS

PRICES

¾" BM-10 — $1399
1" BM-12 — $1499
1¼" BM-14 — $1599

MODEL NUMBER	LINE SIZE	SHEAVE DIAM.	SHANK OPENING	BASE LENGTH	BASE WIDTH
BM-10	¾"	10"	4.76"	16.5"	22"
BM-12	1"	12"	5"	24"	28"
BM-14	1¼"	14"	5"	28.3"	31.9"

(continued from page 53)

costs for Navy mission critical computer programs.

Diplomat Room—Session 3B
Systems Engineering

Moderator:
Capt. **Peter A. Bunch,** USCG
Capt. **James E. Grabb,** USCG (Ret.), assistant

9:30 a.m.

"Arctic Trafficability Program—A Review," by **Richard P. Voelker, Ian F. Glen, Frederick Seibold,** and **Ian Bayly.**

This paper describes a multi-year program to make an operational assessment of the feasibility of a year-round Arctic marine transportation system to serve Alaska. Specifically, the three objectives were to: collect meteorological and ice data along potential marine routes; instrument the hull and propulsion machinery to improve design criteria for ice-worthy ships; and to demonstrate that ships can operate in mid-winter Alaskan Arctic ice conditions. The U.S. Coast Guard's Polar Class icebreakers were used to make the "operational assessment" by annually extending the route northward and by operating throughout the winter season. This paper reviews some of the operational and technical achievements to date and plans for future Arctic deployments.

10:15 a.m.

"Extension and Application of Ship Design Optimization Code SHIPDOC," by **William M. Richardson** and **William N. White.**

(Abstract of this paper not available at press time.)

11:00 a.m.

"Human Factor Considerations Applied to Operations of FFG-8 and LAMPS MK III," by **A. Erich Baitis, Terrence R. Applebee,** and **Thomas M. McNamara.**

The FFG/LAMPS MK III Operator Guidance Manual (OGM) was developed for and will apply to all FFG-7 Class frigates that are not fin stabilized or are operating with the fins off. The OGM was developed to assist the ship operators of the FFG-7 Class in choosing ship speed and heading combinations that will minimize actual or potential ship motion-related problems during various phases of LAMPS deployment. Crew safety and performance were major concerns in the development of the OGM. This paper reviews the applications and impact of human factors on ship operation during helicopter recovery, maintenance, and transit to and from the hangar.

Empire Room—Session 3C
Hull Coatings

Moderators:
Dr. **Alexis I. Kaznoff** and Dr. **Cyril F. Krolick**
Robert G. Keane Jr., assistant

"New Technology Antifouling Paints: U.S. Navy Research and Assessment," by **Gerard S. Bohlander** and **Herman S. Preiser.**

This paper describes several ship trials that are now under way on both destroyers and submarines. More than 200 different commercial and Navy paints have been applied as patches, as bands, on entire hulls, and on exposure test panels mounted on bilge keels. Periodic inspections utilizing diver-operated still and video cameras are made. The factors of ship power, paint condition, and hull roughness are being correlated for selected test vessels.

New trends in antifouling paint technology are also discussed, as are problems associated with application and removal of toxic paint materials.

10:15 a.m.

"Underwater Cleaning Technology," by **Christopher P. Cologer.**

During the fuel crisis of the

early 1970s, the U.S. Navy implemented a program for underwater cleaning of Navy ships. New methods were developed for cleaning, inspection, and performance rating. More than 40 ships involved in multiple cleanings were included in the program over a six-year period. Interactions of hull cleaning with paint performance were studied. Performance factors that evolved included chemical reactions of the copper-based antifouling paints, blistering of the anticorrosion paints, brushing intensity during cleaning, and cathodic protection systems. Underwater cleaning was established as a viable option for extending the service life of antifouling coatings.

11:00 a.m.

"Organotin Antifouling Paints and the Environment—Drydock Phase," by **Carl M. Adema** and **Paul Schatzberg.**

Fuel savings of several hundred million dollars annually are expected from a pending Navy decision to use antifouling hull paints based on tributyltin compounds. Several Navy and commercial ship trials have demonstrated that these paints routinely outperform the current military specification paints based on cuprous oxide. Additional savings are expected as a result of less frequent drydocking and the elimination of underwater hull cleaning.

However, because the organotin compounds are more toxic than cuprous oxide, the potential effect on the environment must be considered. Organotin discharge regulations and current drydock practices are reviewed, and the quantity of organotin generated during drydock operations is estimated. An environmental assessment of the Fleet-wide use of organotin antifouling paint is being prepared under contract.

Palladian Room—Session 4A
Hull Design

Moderator:
Capt. **Roger M. Nutting,** USN
Edward N. Comstock, assistant

2:30 p.m.

"'No Frame' Concept—Its Impact On Shipyard Cost," by **Natale S. Nappi, Ronald W. Walz,** and **Christopher J. Wiernicki.**

A proposed cost-effective alternative to current U.S. Navy ship design and production practices is presented in this paper. This proposed design for producibility concept involves the elimination of structural stanchions and transverse web frames. The potential impact of this "no frame" concept on structural design, weight, and construction material costs for frigates and destroyers is reflected in 1) reduced costs for installation of distributive systems, 2) a reduced number and complexity of structural details providing a more reliable and less costly structure, 3) reduced total ship depth, and 4) reduced primary hull girder stresses.

3:15 p.m.

"Advanced Technology In Ship Design Analysis and Production," by **M.N. Parker, A.Y. Odabasi, P.A. Fitzsimmons,** and **C.J. Goggin.**

Within the past 10 years, ship design, shipbuilding, and ship operation have witnessed the emergence of new micro-computer technologies that have had a dramatic impact on the way ships are designed, built, and operated. This paper presents the development of the BRITDES computer-aided design and detailing system and its utilization of microcomputers in ship design, analysis, and production.

4:00 p.m.

"An Advanced Methodology for Preliminary Hull Form Development," by **Wen-Chin Lin, William G. Day Jr., Jeffrey J. Hough, Robert G. Keane Jr., David Walden,** and **In-Young Koh.**

An advanced methodology is presented for developing hull forms that attain improved performance in both seakeeping and resistance. Contrary to traditional practice,

(continued on page 58)

ASNE Day

(continued from page 57)

the methodology starts with developing a seakeeping-optimized hull form without making concessions to other performance considerations, such as resistance. The seakeeping-optimized hull is then modified to achieve improvement in other performance characteristics without degrading the seakeeping. Presented is a point-design example produced by this methodology.

Merits of the methodology and the point-design are assessed on the basis of theoretical calculations and model experiments. This methodology utilizes a subset of the Hull Form Design System that is used at NAVSEA. A brief description of the function and capabilities of the programs in this subset, and their relation to the total HFDS are discussed.

Diplomat Room—Session 4B

Ship Propulsion

Moderator:
Dr. **Warren C. Dietz**
James L. Corder, assistant

2:30 p.m.

"Testing of a Magnetically Treated West German Diesel Engine," by LCdr. **James W. White,** USN.

Aluminum-block, non-magnetic diesel engines have been less reliable in service than their cast-iron counterparts. Additionally, nonferrous engines are produced in small numbers exclusively for military use and thus have no commercial base with which to enhance logistics support.

A West German manufacturer, Motoren-und Turbinen-Union Friedrichshafen GmbH (MTU), has developed a method for magnetically treating cast-iron engines in such a way as to reduce their magnetic signatures and thus make them available for mine countermeasures applications.

In order to take advantage of the improved reliability and supportability of ferrous but magnetically treated production engines, the U.S. Navy conducted an extensive test and evaluation program to confirm or deny the suitability of the engine for a new class of mine countermeasures ships.

This paper describes the unique characteristics of the MTU 6V396TB63 diesel engine, and will consolidate and illustrate the results of endurance, shock, magnetic, and maintenance testing.

3:15 p.m.

"Surface-Hardened Naval Marine Gears with Reference to Alternative Means of Surface Hardening," by **Roger Barker** and **George C. Mudd.**

It has become common practice in naval marine gear units of European manufacture to take advantage of the greater load-carrying capacity resulting from a surface-hardening process. The surface-hardening processes available to the gear designer are many and varied, each having advantages and disadvantages.

This paper examines the three principal applicable processes, explains the characteristics of each and how the disadvantages may be controlled. The load-carrying capacity of gears made with the different surface treatments is then discussed, including the effects of hardness gradient, residual stress, and size on capacity.

4:00 p.m.

"Advanced-Cycle Gas Turbines for Naval Ship Propulsion," by **Thomas L. Bowen** and **Dan A. Groghan.**

Investigations are currently being conducted by the Navy and several contractors to determine the technical feasibility and cost effectiveness of advanced regenerative or intercooled-regenerative gas turbines as naval propulsion engines for future mid-size surface combatants. A comparison of the performance characteristics of these engines indicates that significant increases in the thermal efficiency above current simple-cycle engines may result by adding heat exchangers for regeneration alone

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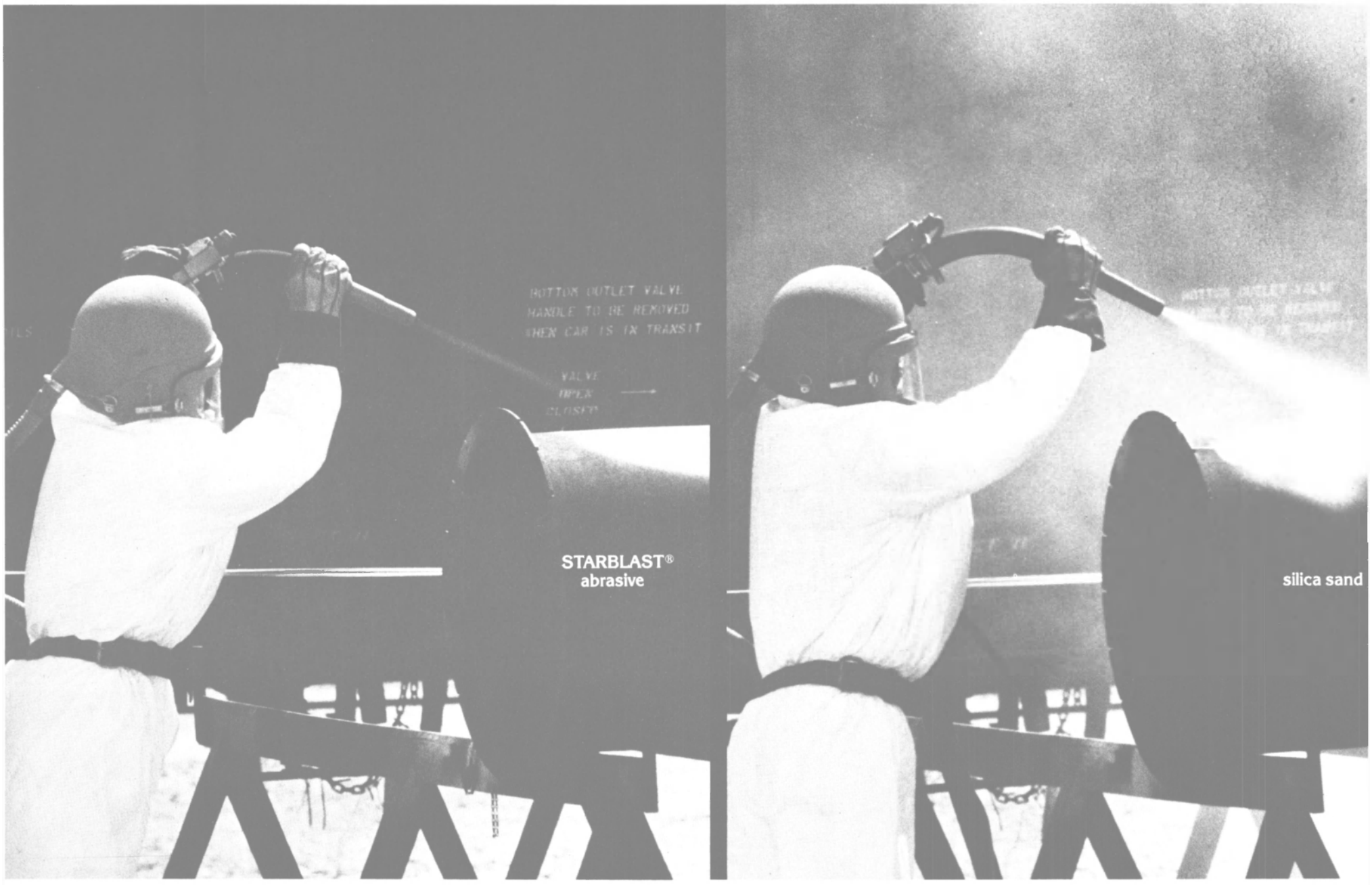

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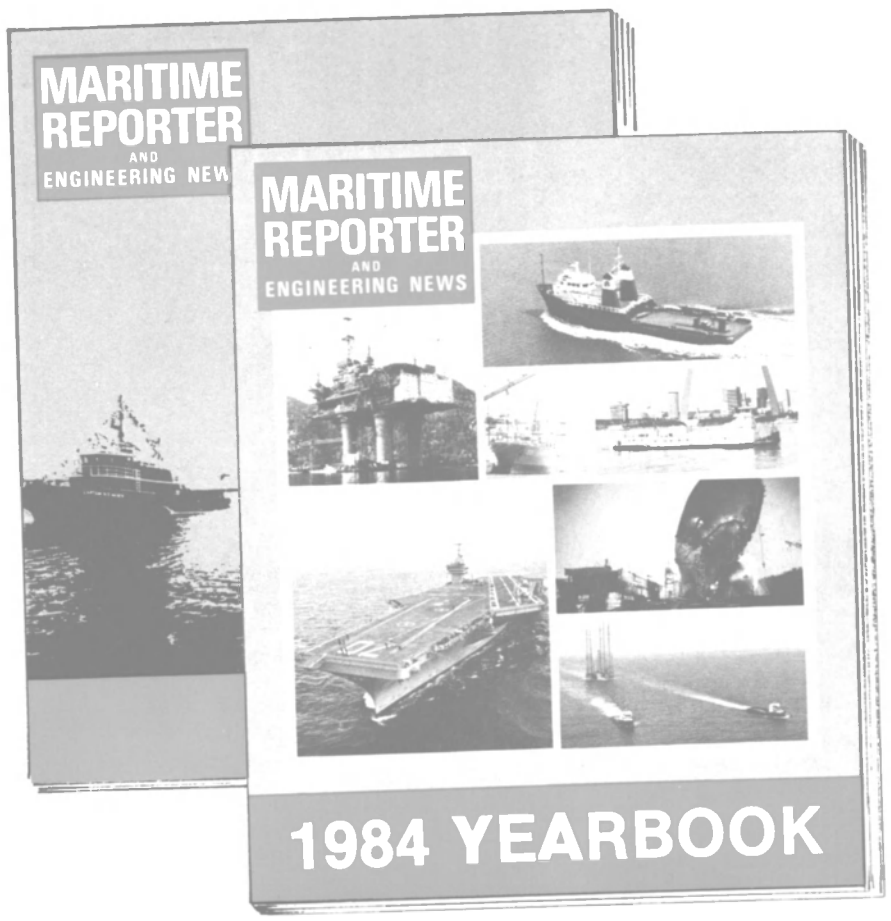

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This will be a true outlook issue ... dealing little with the past ... primarily with future predictions by leading marine industry experts of activities to come in all areas of the commercial maritime/offshore industry. Among the contents planned for this ANNUAL YEARBOOK ISSUE are ...

- **U.S. SHIPBUILDING REPORT AND OUTLOOK —** Vessels building or on order in U.S. shipyards plus the outlook for the future.
- **U.S. NAVY —** A complete report — The present size and future prospects for a larger, more formidable U.S. Naval Fleet.
- **WORLDWIDE SHIPBUILDING OUTLOOK —** A view toward future ship construction levels in leading foreign yards.
- **OFFSHORE DRILLING —** The current picture on new rig and support-vessel activity plus estimations of future trends by key industry leaders.
- **U.S. INLAND WATERWAYS —** Predictions for the future in detail provided by leading experts on shallow-draft vessel operations and tug, towboat and barge construction.

INTEREST THIS JUNE 1st YEARBOOK ISSUE WILL GENERATE.

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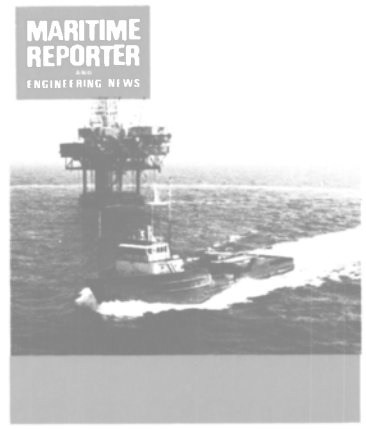

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ASNE Day

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or with intercooling. Design performance characteristics of several advanced-cycle gas turbines are described that utilize turbomachinery from various existing simple-cycle gas turbines. Estimates of the weight and volume of heat exchangers included in these conceptual designs are provided.

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CATERPILLAR

Propellers '84 Scheduled For May 15–16 At Cavalier Hotel In Virginia Beach

The fourth in a series of international symposia on ship propellers that have been attracting wide attention in the marine engineering community for the past decade will be presented on May 15–16 at the Cavalier Hotel in Virginia Beach, Va.

Titled Propellers '84, the meeting is being organized by the Technical and Research Program of The Society of Naval Architects and Marine Engineers and the Hampton Roads Section. A total of 21 papers on various aspects of marine propellers and related propulsion components are scheduled for delivery at the symposium, the authors representing a cross section of expertise from Europe and America.

Propellers '84 will be broader in scope than Propellers '75, '78, and '81 Symposia, and is intended to:

- Make the nature and extent of the multi-disciplinary information gaps regarding propellers' strength clear to the marine community;
- Provide the most up-to-date information available;
- Provide an opportunity for the freest possible exchange of views on propeller strength and performance considerations that have not been firmly established;
- Encourage the vitally needed research efforts to provide safe, long-lasting propellers having the very highest efficiencies; and
- Obtain ship operator service experience input.

Chester L. Long, chairman of the Ships' Machinery Committee of SNAME, is general chairman of Propellers '84, and **Andrew A. Szypula** is chairman of the Technical Committee, which is made up of the members of Panel M-16 (Modernization of Propulsion Shaft Systems) of the Technical and Research Program of the Society.

Sales/Marketing Manager Named At Heat Transfer Division/American Standard

Robert R. Albaugh

Robert R. Albaugh was recently named manager, sales and marketing for the Buffalo, N.Y., based Heat Transfer Division, of American Standard Inc., according to **Don A. Meyer,** vice president and general manager of the division.

Mr. **Albaugh** is responsible for all sales and marketing activities, worldwide, for the division. The Heat Transfer Division manufactures and markets heat exchangers and heat recovery systems for district heating, general industry, processing and marine applications.

Mr. **Albaugh** graduated from General Motors Institute with a bachelor's degree in mechanical engineering and earned a master's degree in industrial administration from Purdue University.

IT&T Awarded $7-Million Increase To Navy Contract For Radar Accessories

International Telephone and Telegraph, Van Nuys, Calif., has been awarded a $6,949,996 modification to a previously awarded firm-fixed-price Navy contract for seven precision approach radar solid state modification kits and 15 OJ-33A/GPN radar horizontal and elevation indicators. The Naval Electronic Systems Command, Washington, D.C., is the contracting activity.

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You simply can't go wrong with Furuno radars. See them all, plus our complete range of other marine electronic products, at any of more than 200 authorized dealer outlets all over the U.S., or write for our full color catalog.

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A New Look At

ADVOCACY AND INFLUENCE IN WASHINGTON

Jeffrey A. Smith, Director of Public Affairs
The American Waterways Operators, Inc.

Jeffrey A. Smith

"In the wars currently being fought over laws and regulations in Washington, the weapons of advocacy aren't always traditional."

In the old days one could argue that in the years before much-needed reforms were instituted, a well-connected lobbyist who was adept at entertaining could count on at least certain votes being cast as the lobbyist requested. But numerous reforms later, much of that has changed. No doubt there is still real value in an informational chat with a member of Congress over a friendly cocktail. And there is still much to be said for the access, not necessarily the votes, that an intelligently placed political contribution can gain. Yet in the wars currently being fought over laws and regulations in Washington, the weapons of advocacy aren't always traditional.

The inland and coastal domestic shallow-draft transportation industry, in fact much of the marine industry, is fighting for its very survival on a number of fronts in Washington. Among other issues in Congress, we are battling against the threat of new and disastrous user charges, and fighting to preserve the Jones Act, the foundation of our competitive position. At the same time, we are trying to convince the Interstate Commerce Commission, the White House, and the Congress, that if railroads are permitted to gobble up barge lines, everybody except the railroads will be the big losers. There are critical issues facing us today, and their outcome could drastically alter the face of our industry.

Educating and informing the decisionmakers in Washington, with the purpose of influencing them on behalf of a special interest, requires careful planning and innovative action. Our industry—any industry—can ill afford a lack of knowledge on how to advocate an issue, or the inability to act and act appropriately when the time comes.

One of the newest issue advocacy techniques, and one of the most successful, is to generate a large groundswell of "grassroots" support or opposition for a legislator's position on an issue, usually in the form of thousands of letters, postcards and phone calls arriving both in his Washington and home district offices a day or two prior to a key vote.

Before the vote on President **Reagan's** tax cut a few years back, a Congressman told me "Dammit, I'm a Democrat! I'm against this tax cut and I *thought* my district was against it. But I've got sixteen huge boxes of mail sitting in my office telling me to vote for this thing and the phone hasn't stopped ringing since last week. What should I do?"

I stood with him on the Capitol steps as he flipped a coin in the air, watched it land, and then walked into the House Chamber to vote for the tax cut.

But the letters, postcards, telegrams, mailgrams, visits and phone calls of any grassroots campaign do not materialize spontaneously in a legislator's office. Such an effort requires careful planning, preparation and distribution of quality materials. Participants in grassroots efforts must be educated on the issues, often by their employer who is kept informed through a trade association. Alliances must be formed and in place among many—often diverse—interests. Coalitions for action must be created that extend beyond the traditional trade association. In fact, the more diverse the basis of supporters or critics, the more the cause benefits in a Congressman's eyes, as long as the groups are all saying the same thing, in the right way, at the right time. For truly effective grassroots campaigning, substantial numbers must be involved, and careful monitoring of the issue at hand is required in Washington to determine exactly the right moment to mobilize. A good working knowledge of the grassroots process is essential to any group or industry wishing to influence a decision or advocate an important issue. Members of Congress are aware of grassroots advocacy. They understand how it works and what it represents. They expect it, and they respond to it. Some industries have found, to their horror, that failure to understand the grassroots process can be deadly.

Think for a moment about mounting a defense against attempts to weaken or repeal the Jones Act. Think of the potential a solid and unified grassroots base, made up of marine interests—inland, coastal, ocean-going, lake carriers, small and large shipyards, associations, management, labor, et. al.—could exercise in Washington.

Another essential and less traditional weapon in the issue advocacy business is the media. What most people, including politicians, know about our industry is limited to what they read in newspapers and magazines, hear on the radio, or see on television. Barges, towboats and tugboats, locks and dams, ports and harbors are not all that visible to the general public in daily life. Every few years, along comes a network news story about some allegedly wasteful "Pork Barrel" water project. We watch as the Congressman who advocates such a project feels the heat of questioning on national television, and that's the end of it. The water project, useful or not, will forever bear that distasteful moniker, and future projects can expect the same. Yet our industry can no longer afford to be ignored or misrepresented in the media, and at the same time we need to turn the media's power of persuasion to our own advantage.

As veteran CBS newsman **Daniel Schorr** told a recent seminar in San Francisco: "In this mass communication society, if you don't exist in the media, for all practical purposes you don't exist."

How can our industry effectively use the media as an advocacy tool on Capitol Hill? For one thing, frequent news coverage of an issue in a Congressman's hometown paper will generate letters from his constituents, will influence a newspaper's editorial bias, and will keep the issue visible in the public's mind. If a Congressman reads an editorial in his local paper about the number of jobs our industry creates in his district, he's going to pay attention. It is our job as advocates to make sure the editorial appears, and then to make sure

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AWO

(continued from page 67)

the Congressman reads it. For example, at AWO when a pro-industry news story appears in a local media outlet, whether it's placed by us or not, we send it along with a letter to the Congressman in whose district paper the story ran. So far, this small but effective program has been highly successful.

Congressmen read and pay attention to their local media very carefully. The local media is their free source of hometown publicity, advertising their political accomplishments and activities to potential voters when things are going well, and pulling them down with criticism and negative editorials when they don't. The local voters in New London, Connecticut or Greenville, Mississippi for example, don't look to the *New York Times* or *Washington Post* for their Congressional voting advice. They read the local papers, watch the local television and listen to the local radio.

Generating a large number of quality local news stories on a particular industry issue can lead to news and editorial coverage by larger metropolitan daily papers. If properly managed and channeled, the issue will be picked up by television and radio and by the wire services and the networks. Politicians, who must out of necessity track the elusive animal called public opinion, will be carefully watching, and reading, and polling. If the heightened news coverage can be combined with a well-timed and coordinated groundswell of grassroots action in support of our issues, no legislator can ignore it. How could he?

On many of our most critical fronts, being recognized by the media and being able to mobilize and voice our opinions will mean the difference between failure or success for our industry—between raising the decisionmaker's consciousness, or just plain whimpering alone in the dark, unnoticed.

Detyens Yard Awarded $4-Million Navy Contract For LST-1180 Overhaul

Detyens Shipyard, Mt. Pleasant, S.C., has been awarded a $3,989,981 firm-fixed-price contract for the regularly scheduled overhaul of the tank landing ship USS Manitowoc (LST-1180). The Supervisor of Shipbuilding, Conversion and Repair, Portsmouth, Va., is the contracting activity.

Jens Lademann Joins Jacobs And Associates

Jens L.C. Lademann

Jens L.C. Lademann has joined R.D. Jacobs and Associates, a consulting engineering firm based in Roscoe, Ill. Announcement of the appointment was made by **R.D. Jacobs,** the firm's president.

Mr. **Lademann** completed an apprenticeship in Denmark and later received a degree in mechanical engineering from Odense Teknikum in Odense, Denmark. He came to the U.S. in 1967 and joined Fairbanks Morse Engine Division, Colt Industries, and served in various engineering capacities relating to marine propulsion and power generation applications for large diesel engines. Most recently he was supervisor, warranty control.

R.S. Jacobs and Associates specializes in engineering services relating to the design and operations of marine propulsion systems as well as power generation systems, both marine and stationary.

Lingaas Named Senior VP For Cruise Operations At Holland America Line

Arvid Lingaas

Capt. **Arvid Lingaas** has been appointed senior vice president for cruise operations for Holland America Line. The announcement was made by **Kirk Lanterman,** president and chief operating officer of the Seattle-based cruise and travel company.

Captain **Lingaas** will be responsible for all technical and maritime operations for HAL's five ships—Rotterdam, Volendam, Veendam, Nieuw Amsterdam, and the currently under construction Noordam. The Volendam and Veendam, formerly Moore McCormack's Brasil and Argentina, are being sold to the Tung Group and will be turned over to the new owner in April this year.

The new senior vice president will have responsibility for managing all ships' officers and crew, hotel services, and all on board passenger services, including entertainment, shops, food, etc.

Captain **Lingaas** has more than 20 years of ship management experience. Most recently he was president of United Ship Management, responsible for Costa Line and Hellenic American Cruises charter passenger ship operations in Miami. He also was a senior vice president for Norwegian Caribbean Lines in Miami. He served as master on NCL's Southward, Starward, and Skyward, and has served as an officer in the Royal Norwegian Navy.

New Round Plait Rope Developed By Samson

A new type of fiber rope has been developed by Samson Ocean Systems, Inc. of Boston for use as ship tie-up lines, towing hawsers, surge dampeners, and for oceanographic moorings. Called Round Plait™, the new design uses a special 12-strand construction that provides a firm, round cross section, high strength-to-weight ratio, and spliceability similar to 8-strand plaited rope.

Among the advantages reported by Samson are more effective surface for working on capstans and winches, high abrasion resistance, and inherent flexibility for easy handling. It is also said to be torque-free and non-hockling.

Samson Round Plait is available in nylon, polyester, and polypropylene in sizes to 15-inch circumference with tensile ratings to 696,000 pounds.

For additional technical data and prices,

Circle 28 on Reader Service Card

Karpenski Appointed Assistant Director, Contract Administration, At Foster Wheeler

Martin J. Karpenski has been appointed assistant director of contract administration for Foster Wheeler Energy Corporation, Livingston, N.J.

Mr. **Karpenski** joined Foster Wheeler in August 1974 as a commercial analyst in the steam department and became an attorney in the contract administration department in 1977. He was appointed senior supervising attorney in the contract administration department in 1980.

A 1971 graduate of Villanova University (B.S., chemical engineering), he received a J.D. degree from Seton Hall University, School of Law in 1974.

AIMS Endorses New Marine Firefighting Training Program

A new training series featuring firefighting techniques taught by Texas A&M University's Marine Firefighting Training School is now available from Gulf Publishing Company Video. The series, *Marine Firefighting*, has earned the endorsement of the American Institute of Merchant Shipping (AIMS).

"The only other film like it was produced by the U.S. Coast Guard more than 20 years ago," says **Gerald Babin,** GPC Video's executive producer. The people at Texas A&M provided the content and AIMS reviewed and endorsed the series.

The program details the five areas of marine fire training taught at Texas A&M University, College Statio, Texas. Divided into five videotape modules, the series begins with part one, *Exploring Fire's Chemistry;* and continues with part two, *Portable Extinguishers;* part three, *Water and Fire;* part four, *Use of Foam;* and ends with part five, *Interior Firefighting*. All tapes were shot on location at the Texas A&M University fire training grounds.

The series provides a fire-fighting training program which can be implemented on board a ship, tanker, or drilling rig. Those who operate vessels on inland waterways, Port Authorities, and fire departments who may be called upon to fight a fire on board a docked ship should know and understand the techniques taught here. GPC Video will offer this series in both Italian and Korean in the fall of 1984.

To obtain a free 4-color brochure on the series from Gulf Publishing Company Video,

Circle 37 on Reader Service Card

Circle 200 on Reader Service Card

Promotions Announced At Marine Transport Lines

Louis J. Conti, chairman of the board of Marine Transport Lines, has announced a number of promotions in the operations and financial staffs of the company.

Joseph G. Drescher has been appointed vice president-operations. He has been with the company for 14 years, and was previously fleet director. Succeeding him in that post is **Nicholas Orfanidis,** a 10-year veteran with the company.

Donald Hutton has been named fleet manager. He is also a 10-year veteran, and previously served as port engineer and marine superintendent.

On the financial side, **W. Herschel Chittum** has been appointed assistant vice president-finance. He was previously controller, and has been with the company for the past two years. Named to replace him as controller is **Anthony N. Citrola,** who has been with MTL since 1978 and was previously assistant controller. **Joseph M. DiMarco** has been appointed treasurer; he joined the company in 1976 and has held various financial posts.

Hartzell Offers Free Literature On Marine Duty Fans

Marine Duty axial flow blowers from Hartzell Fan Inc., are described and illustrated in a 20-page brochure. These blowers are AMCA certified and are available to meet Federal Marine Specifications in sizes 12" to 60" diameter with static pressures to 14" w.g.

A wide assortment of accessory items are available including inlet bells, vibration isolators, special motors and corrosive resistant coatings. The brochure (A-143) contains a selection guide for assistance in specifying proper marine equipment.

For a free copy,

Circle 34 on Reader Service Card

Worthington Offers New Cast Iron Pump Line — Literature Available

A general-purpose line of efficient end-suction pumps with capacities to 1,200 gpm is being offered by Worthington through its national network of independent distributors and direct-sales personnel.

The cast iron pumps, designated as the D-800 line, are available in 19 sizes, frame-mounted or close-coupled. The pumps are designed for minimum operating and maintenance costs.

Features include a bell-shaped mechanical seal cover to provide improved mechanical seal life. Frame-mounted pump bearings are conservatively designed and maintenance-free, being sealed for life and pre-lubricated. Other advantages cited for the pump include back-pullout, allowing complete access to pump internals without disturbing system piping; integral adapter seal cover for added pump rigidity and fewer internal components; dry rabbet fit at the casing joint to eliminate internal corrosion and to aid in pump disassembly when being repaired; and top centerline discharge casings to simplify system piping and remove stress on pump bearing frame.

Standard materials of construction include a high-grade cast iron casting with precision bronze vacuum die-cast impellers of enclosed design. High-strength steel shafts will be protected at the mechanical seal area by renewable bronze or 416 SS sleeves. An all-cast-iron fitted pump is also available.

For free literature and specifications on the D-800 line,

Circle 12 on Reader Service Card

Management Appointments Announced By Crowley's Caribbean Division

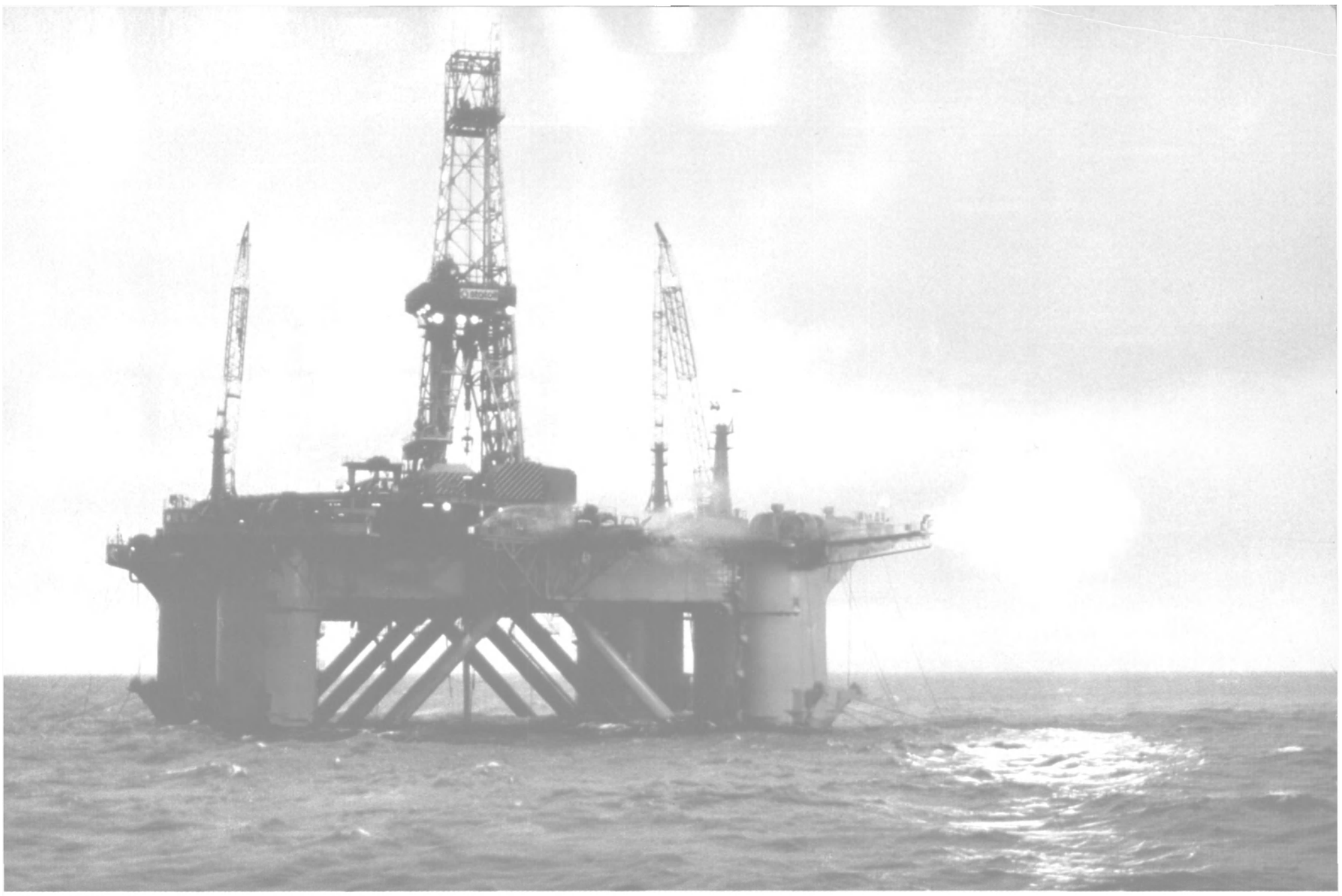
Four key appointments have been made in Crowley Maritime Corporation's Caribbean Division, according to a recent announcement by **Robert G. Homan,** Jacksonville, Fla., Crowley senior vice president and general manager of the division.

David N. Messer has been appointed to the new position of vice president, common carrier services, based in Jacksonville. He has held a number of positions during his six years with the company including, most recently, vice president, market development. He was instrumental in development of the division's U.S. Northeast roll-on/roll-off service to the Caribbean.

Gene A. Tonsager has been named assistant vice president, marketing, replacing Mr. **Messer** in responsibility for market development as well as maintaining his previous duties as assistant vice president, pricing. Mr. **Tonsager,** who joined the company last June, is based in Jacksonville.

John S. Hollett has been appointed director of South Atlantic common carrier services, based in Jacksonville. He was formerly director of marketing for Crowley's Caribbean Division contract transportation services, and has been with the Crowley organization for seven years.

Jose A. Amadeo has been named director of Caribbean Services, based in San Juan, Puerto Rico, overseeing Crowley operations in RO/RO services to the U.S. mainland as well as to other destinations in the Caribbean, and contract tug and barge services. Mr. **Amadeo** joined the company in 1982. Prior to this appointment he was director of marketing and administration for Trailer Marine Transport Corporation in the Caribbean.



Photo—Tenneco Inc.

OTC 84

Innovative approaches to deepwater drilling and production, the role of government regulations in promoting offshore safety, breakthroughs in seismic surveying, and coping with ice forces in arctic construction are just a few of the topics that offshore experts will address during the 1984 Offshore Technology Conference (OTC) May 7–9 at Houston's Astrohall.

Offshore engineers, scientists, and managers from around the world will attend the meeting for three days of high-level discussions and technical presentations. Now in its 16th year, OTC is the leading worldwide forum for exchange of technical information related to ocean resources development and the environment.

Speakers at four Topical Luncheons will cover key technical issues facing the offshore community. These luncheons are designed to stimulate an open exchange of views among those who attend.

The technical program will include almost 200 papers focusing on case studies of major offshore developments, new drilling and producing technologies, arctic operations, diving support, ocean mining, geological and geophysical advances, the environment, and special topics. Sessions of particular interest will feature discussions of Exxon's Lena Guyed Tower, an innovative deepwater platform in the Gulf of Mexico; Shell's record water-depth well; and floating production facilities.

The OTC Awards Luncheon on Monday, May 7, will honor outstanding technical achievements by an individual and an organization in the offshore industry. Recipients are **Ronald L. Geer,** a pioneer in floating and subsea completion technology, and Exxon Company U.S.A., cited for design and installation of the Lena Guyed Tower.

There will be no exhibition at the 1984 OTC. The 1985 OTC will return to the conference and exhibition format.

OTC is sponsored jointly each year by 11 of the world's most prominent engineering and scientific societies with a combined membership of more than 500,000. The Society of Petroleum Engineers, headquartered in Dallas, is the managing group for OTC.

Technical Program

The Program Committee has chosen almost 200 technical papers from 537 abstracts received last year. Authors will present these papers in 35 sessions Monday through Wednesday, May 7–9, in the Astrohall.

"The abstracts we received for this year's meeting have better technical quality and less commercial flair than many we have received in the past," said **Brian J. Watt** of Brian Watt Associates in Houston, chairman of the Program Committee. The papers come from around the world, with particularly strong representation from the U.S., Canada, and Japan, and contributions from the U.K., Norway, and other North Sea countries.

Mr. **Watt** said the committee recognized its responsibility for success of the 1984 OTC, as the meeting does not include a technical exhibition this year. "We have emphasized coherence and currency on major subjects," he said.

The committee strove to make the 1984 program especially relevant by organizing special ses-

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BRAZILIAN SHIPBUILDING

A Special Advertising Report

Verolme yard at Angra dos Reis

LANDSBERG SEES DECLINE OF TRADITIONAL BUILDERS

Peter A. H. Landsberg, the 60-year-old president and new owner of Verolme do Brasil, believes that shipbuilding is no longer an "appropriate" industry for highly industrialized nations, which are entering the "post-industrial" stage of economic development.

In a recent interview at Verolme's headquarters in Rio de Janeiro, Landsberg said that the shipbuilding industries of the U.S. and Europe are in an "irreversible decline," and even the large Japanese yards show signs of losing their competitive edge.

Landsberg

Developing nations such as Brazil, Korea and China inevitably will be the dominant forces in world shipbuilding, Landsberg says.

He outlined some of the specific advantages which will permit Verolme to participate in this growth:

—"We have a large local market in Brazil, which is the basis for any export potential."

—"Brazil has a sophisticated industrial base which is larger, for example, than Korea's."

—"Local steel is of excellent quality, and we have ample supplies of electrical power."

—"We have a stable labor pool, with no strikes affecting Verolme in more than 20 years."

—"Automation can only be taken so far in shipbuilding. After that, labor quality is what counts — and our productivity is better than that of European yards, with the same quality."

— "Our yard is one of the most modern in the world. We can tailor ships to special order better than the mass-production yards of Japan and Korea." ■

VEROLME ASSUMES LEAD IN INDUSTRIAL EXPORTS

Verolme do Brasil, with overseas sales of ships and offshore platforms totaling US$200 million in 1983, has become the leading private Brazilian exporter of manufactured goods.

During the past four years, Verolme's exports have totaled US$428 million, keeping Brazil firmly in the highly competitive international shipbuilding marketplace.

Verolme executives believe that their chances to win new orders at home and abroad, especially in the field of military vessels, have been enhanced by the change in company ownership which occurred during late 1983. Peter A. H. Landsberg, the Brazilian executive who became president of Verolme in 1981 after 14 years as head of Shell's Brazilian operations, has purchased Verolme from its Dutch parent company Rijn-Schelde-Verolme (RSV).

The US$63-million purchase deal is one of the largest-ever local buyouts of a foreign-owned firm.

Since entering the export business four years ago, Verolme's success has been marked by the size and diversity of its construction capacity — for ships up to 600,000 dwt and offshore rigs of any type and size — plus the company's ability to please some of the market's most demanding customers.

Gulf International of Geneva, for example, took delivery of four Verolme-built 70,000-dwt grain carriers in 1982-83. Gulf executives now report they have "never received better ships."

This group has another four Verolme 44,500-dwt carriers on order. And Verolme beat out 70 other competitors — including Japanese and Korean firms — to take a US$116-million Aramco contract in December 1981 for four self-propelled jackup oil platforms. They were delivered in 1983.

Today, Verolme is expanding and diversifying its Brazilian facilities to move into new industrial transportation fields — including the building of large off-road mining trucks and dredges. ■

FIRST US NAVY JOB IN BRAZIL

Verolme completed the first Brazilian repair job on a U. S. Navy vessel in early 1984 and intends to expand this type of specialized service work at its fully integrated Angra dos Reis shipyard. Located 70 miles southwest of Rio de Janeiro, the yard has a 200-man team devoted exclusively to repair jobs.

U.S. Navy authorities say they were "very impressed" with Verolme's efficiency in handling the 20-day hull and general repair work on the oceanographic research vessel Wilkes.

Verolme's previous repair assignments, mainly for Brazilian owners, have been concentrated in the area of offshore oil drilling rigs and exploration platforms and ships. ■

Verolme's repair dock

VEROLME

For additional information about Verolme, contact:
Edna de Almeida, External Affairs Advisor
Verolme Estaleiros Reunidos do Brasil S.A.
Rua Buenos Aires, 68 – 36th Floor
20070 Rio de Janeiro, RJ – BRAZIL
Telephone (021)292-3148 – Telex (021)23766 VERB

continued

sions on significant current issues, including sessions on the Lena Guyed Tower, the Deepwater Well, Floating Production Systems, Limited Driving Force in Ice, and High-Resolution Geophysics. Committee members actively solicited specific authors and papers in those areas. "Our work was active, not reactive," Mr. **Watt** said. "This insures that the program will cover the topics that the offshore industry most wants to hear about."

Other program topics include offshore pipelines, platform dynamics and construction, diver support systems, arctic drilling, mooring and anchoring, seafloor processes, ocean mining, and environmental concerns.

The Program Committee also organized the Topical Luncheons that are an innovative feature of the 1984 OTC. Mr. **Watt** explained: "We asked the luncheon speakers to look into the future and to speculate on where we go from here. We're looking for opinions as much as facts—we want controversy on an informed level."

The Topical Luncheons

Speakers at four Topical Luncheons May 8 and 9 will address key technical and regulatory issues now facing the offshore industry. These luncheons have been designed to encourage the exchange of information among the engineers, scientists, and managers who attend OTC seeking the solutions to current technical problems. Each of the luncheons will include a question and answer period after the keynote speech.

Two luncheons are scheduled for May 8. At the Shamrock Hilton Hotel, **Carl Wickizer,** engineering manager with Shell Offshore Inc., will discuss "Shell's Exploratory Well in 6,448 Feet of Water on the U.S. Atlantic Coast." Shell drilled this well in a record water depth offshore New Jersey during late 1983. Mr. **Wickizer** will present an overview of the deep water drillings project including planning, special requirements, and problems encountered.

"Does Regulation Promote Offshore Safety?" Capt. **Thomas Tutwiler** of the U.S. Coast Guard will address this question at the Astro Village Hotel luncheon. He will discuss how offshore casualties have influenced government regulatory programs.

The luncheons on May 9 will focus on frontier offshore oil and gas production. At the Astro Village

TIMETABLE
TECHNICAL SESSION

Monday Morning—9:00 a.m. to 12:00 noon
- Lena Guyed Tower I
- Dynamics of Offshore Structures
- Water Treatment/Diver Tools
- Offshore Pipelines
- Arctic Islands
- In-Situ Soil Testing

Monday Afternoon—2:00 to 5:00 p.m.
- Lena Guyed Tower II
- Ice Forces
- Marine Geotechnique
- Marine Geology and Seafloor Processes
- Arctic Operations
- Materials Technology

Tuesday Morning—9:00 a.m. to 12:00 noon
- Limited Driving Force in Ice
- High Resolution Geophysics I
- Subsea Completions
- Vessel Stability and Dynamics
- Marine Risers
- Welding Technology

Tuesday Afternoon—2:00 to 5:00 p.m.
- The Deep Water Well
- High Resolution Geophysics II
- Platform Construction
- Mooring and Anchoring
- Corrosion Fatigue
- Marine Minerals Mining

Wednesday Morning—9:00 a.m. to 12:00 noon
- Lithology and Seismic Reflectivity
- Floating Production I
- Drilling and Completions
- Arctic Drilling Units
- Foundations
- Wave Forces

Wednesday Afternoon—2:00 to 5:00 p.m.
- Seismic Technology
- Floating Production II
- Risk and Reliability
- Wave and Current Loads
- Foundations on Calcareous Soils

Hotel, four industry leaders will examine "Design Considerations in the Transition From Fixed to Floating Platforms." Panelists will be **Joe W. Key,** president of Key Ocean Services (moderator); **Alan C. McClure,** president of Alan C. McClure Associates Inc.; **Jay B. Weidler,** senior vice president of Brown & Root Inc.; and **Andrew F. Hunter,** supervising marine engineer with Conoco Inc. They will cover technical, economic, and regulatory problems related to innovative concepts such as the guyed tower, tension-leg platform, floating systems, and special support equipment.

Also on May 9, at the Marriott Astrodome Hotel, **Christopher Fay,** director of exploration and production with AS Norske Shell, will speak on "Frontier Hydrocarbon Production: Commercial Development in the Troll Field." He will describe technical innovations needed to produce oil and gas in deep waters and hostile ocean environments, using as an example Shell's Troll field in more than 1,000 feet of water offshore Norway.

In addition to the Topical Luncheons, OTC will hold Roundtable Luncheons in the Astrohall Ballroom May 8 and 9. These luncheons will allow OTC registrants to share information informally on topics covered in the technical sessions.

The Awards Luncheon

Ronald L. Geer and Exxon Company U.S.A. have been named recipients of the 1984 OTC Distinguished Achievement Awards. These awards represent the highest honor conferred by the offshore community. They will be presented at the annual Awards Luncheon on May 7.

Mr. **Geer,** senior mechanical engineering consultant with Shell Oil Company in Houston, will receive the Distinguished Achievement Award for Individuals for his pioneering achievements in floating drilling and subsea completion technology over the past 25 years. He was responsible for the first remote-controlled subsea well completion in the open sea in 1960. He helped prove the semi-submersible drilling rig concept by leading the design group that converted an existing bottom-supported drilling barge into the first semi-submersible, Blue Water I, in 1962. Mr. **Geer** also is recognized for fostering a cooperative spirit among industry, government, and the scientific community.

Exxon will receive the Distinguished Achievement Award for Organizations for the design and installation of the Lena Guyed

(continued on page 76)

OTC Sponsor Societies and Executive Committee

The Society of Petroleum Engineers (SPE-AIME)—**D.G. Russell,** Shell Oil Company.
The American Association of Petroleum Geologists (AAPG)—**M.E. Milling,** ARCO Oil and Gas Company.
The American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME).
The American Institute of Chemical Engineers (AIChE)—**W.B. Katz,** Illinois Chemical Corporation.
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The Institute of Electrical and Electronics Engineers (IEEE)—**J.C. Redmond,** GTE Production Corporation.
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Exhibitor's representative—**R.C. Rieder,** Continental Emsco Company.
OTC Executive Manager—**D.K. Adamson.**

OTC '84

continued

Tower, the world's first commercial guyed-tower drilling and production platform and the focus of two 1984 OTC technical sessions. This structure was installed in 1,000 feet of water on Exxon's Lena prospect in the Gulf of Mexico in 1983. The platform concept—product of 12 years of research, testing, and design—and the innovative equipment and construction methods used for installation are major contributions to deepwater construction technology.

OTC '84

Technical Program

Monday Morning
9 a.m. to 12 noon

- Lena Guyed Tower I

OTC
4649 Lena Guyed Tower Project Overview
4650 Design of the Lena Guyed Tower
4651 Fabrication of the Lena Guyed Tower
4652 Side Launch of the 27,000-ton Lena Guyed Tower Jacket

- Dynamics of Offshore Structures

OTC
4653 Model Tests to Establish a Design Method for TLP/Tether Systems
4654 Analysis of the Dynamic Response of a Free-Standing Conductor Pipe
4655 Measured Dynamic Behavior of North Sea Jacket Platforms
4656 Nonlinear Response Characteristics of TLP With and Without Mechanical Damping System in Very High Waves
4657 Evaluation of a Time-Domain Procedure for the Surge Response of a Tension Leg Platform
4658 Model Test Evaluation of a Frequency-Domain Procedure for Wave-Drift Prediction of Tension Leg Platforms

- Water Treatment/Diver Tools

OTC
4659 Permeation: A New Competitive Process for Offshore Gas Dehydration
4660 Evaluation of Seawater Filtration Systems for North Sea Applications
4661 Fabrication and Construction Aspects of an Offshore Barge-Mounted Seawater Treating Plant for the Arctic
4662 Produced-Water Discharges Into Marine Ecosystems
4663 Development and Evaluation of an Experimental Seawater Hydraulic Tool System for U.S. Navy Divers
4664 Electricity and the Working Diver

- Offshore Pipelines

OTC
4665 The 48-in. Zuluf-Safaniya Gas Pipeline: A Case Story
4666 Predicting Motions of Long Towed Pipe Strings
4667 Stimulated Self-Burial of Submarine Pipelines
4668 Polyethylene Coating Damage on an Underwater Pipeline in the Southern North Sea
4669 Fitness for Service Analysis of the Danish North Sea Oil Line

- Arctic Islands

OTC
4670 Construction of Mukluk Island
4671 Utilization of Marginal Soils for Island Construction
4672 Ice/Berm Interactions
4673 Concrete Revetment Mat Systems for Shore Erosion Control on Offshore Embankments
4674 Wave Runup and Overtopping: A Review and Recommendations
4675 Wave Propagation in the Vicinity of Offshore Islands

- In-Situ Soil Testing

OTC

4676 Seabed Investigations Using the Self-Boring Pressuremeter
4677 Three Years' Experience With the Offshore Self-Boring Pressuremeter PAM
4678 Cyclic Pressuremeter Tests for Cyclic Lateral Loads
4679 Ambient Pressure Sampling System for Deep-Ocean Geotechnical Site Investigations
4680 The Suspension PS Velocities Logging System
4681 Development of In-Situ Measuring Apparatus of Geotechnical Elements of Sea Floor (IMAGES)

Monday Afternoon
2 to 5 p.m.

- Lena Guyed Tower II

OTC

4682 Installation of Guying System for Lena Guyed Tower
4683 Installation of Tower, Deck, and Pipelines for Lena Guyed Tower
4684 Instrumentation for Monitoring Behavior of Lena Guyed Tower
4685 Dynamically Positioned Derrick Barge and Positioning Equipment for Lena Guyed Power Installation

- Ice Forces

OTC

4686 The Distribution of Ice Pressure Acting on Offshore Pile Structure and the Failure Mechanics of Ice Sheet
4687 Shear Strength of Adfreeze Bond and its Effect on Global Ice Load Applied to Mobile Offshore Drilling Units Under Arctic Conditions
4688 Dependence of Crushing Specific Energy of Urea Ice on the Aspect Ratio and the Indentor Velocity
4689 The Coefficient of Friction Between Sea Ice and Various Materials Used in Offshore Structures
4690 Ice Forces Exerted on a Conical Structure in the Gulf of Bothnia
4691 Analysis and Design of Ice Wall Framing for a Concrete Arctic Drilling Structure

- Marine Geotechnique

OTC

4692 Predicting Offshore Soil Conditions
4693 Seismic Response of Offshore Drilling Islands in a Centrifuge Including Soil Structure Interaction
4694 Cyclic and Rate-of-Loading Design Parameters From Rod Shear Tests
4695 Experimental Study of Effective Stress Response of Sand Under Water Wave Loading
4696 Bottom Preparation for Gravity Structures in Beaufort Sea
4697 Geotechnical Monitoring Systems and Performance in Dynamic Ice Environments

- Marine Geology and Seafloor Processes

OTC

4698 The Advanced Ocean Drilling Program: The Next Phase in Scientific Ocean Drilling
4699 A Review of Geology and Petroleum Possibilities of Continental Margins of India
4700 A Model for Utilization of Oxygen Isotopes and Ecologic Logs (Ecologs) in Regional Correlation and Interpretation of Structural History
4701 Bottom Boundary Layer Flow Profiling System
4702 Slumping Due to Hurricane Iwa Along Proposed OTEC Cold-Water Pipe Route, Oahu, HI
4703 Finite-Element Sedimentation Model for Shallow Water

- Arctic Operations

OTC

4704 Project Management Approach to New Generation Arctic Drilling System
4705 A Deepwater Actively Frozen Seabed (DAFS) Drilling/Production Structure for the Beaufort Sea
4706 Design Construction and First Season's Operation of M.V. Kalvik and M.V. Terry Fox/Front Line Icebreakers for the Beaufort Sea
4707 Current and Future Offshore Activities in Canada
4708 Design of Concrete Gravity Structures to Withstand Concentrated Ridge and Floe Impact Loads
4709 The Frequency and Geometry of Bering Sea Ice Ridges From Precision Aerial Photography

- Materials Technology

OTC

4710 Erosion, Cavitation, and Abrasion Resistance of Choke Trim Materials
4711 Development and Testing of New Offshore Cathodic Protection Criteria
4712 Forged Tubulars for Tension Leg Platforms: Material Characteristics and Fracture Resistance in Seawater Environment
4713 Material Properties and Internal Soundness of a Huge Cast-Steel Node Joint
4714 Strength Predictions for Ring-Stiffened Cylinders Under Combined Loads

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OTC '84

continued

4715 New API Equation for Grouted Pile-to-Structure Connections

Tuesday Morning
9 a.m. to 12 noon

- Limited Driving Force in Ice

OTC
4716 Limited Driving Force Concept for Ice Loads on Structures: A Panel Discussion

- High Resolution Geophysics I

OTC
4717 Ocean Bottom Imaging
4718 High-Resolution Seabed Mapping: New Developments
4752 High-Resolution Deepwater Survey Sonar
4720 Shallow Seismic-Derived Acoustic Core Logs
4721 Ice/Berm Interaction Study Using Rotary Sidescan Sonar and Acoustic Profiling Systems
4722 Resolution: A Key to Continental Slope and Rise Processes, U.S. Atlantic Continental Margin

- Subsea Completions

OTC
4723 Field Performance of a Newly Developed 15,000-psi W.P. Subsea Wellhead System
4724 North Sea Marginal Fields: The Subsea Completions Option
4725 Tension Leg Platform Production Riser Tieback Connector Design and Development
4727 Evaluation of the Subsea Tree After 20 Years' Production - 'Findings and Conclusions'
4728 New Expendable Standing Valves and Plugs Permit TFL Work in Low-Pressure Water-Injection Wells

- Vessel Stability and Dynamics

OTC
4729 Stability and Dynamics of Semisubmersibles After Accidental Damage
4730 Fault Analysis of a Semisubmersible's Ballast Control System
4731 Full-Scale Measurement Test on the New Semisubmersible Polycastle
4732 Linearized Dynamic Stability of Barges for Transportation of Offshore Structures
4733 Design Aspects for Transport of Jackup Platforms on a Barge
4734 Collision of a Tanker With a Platform

- Marine Risers

OTC
4735 Riser Analysis Methods: Comparison With Measured Field Data
4738 Vertical Dynamics of Marine Risers
4739 Field Test of Large, High-Pressure Flexible Pipe
4737 Multipurpose Active/Passive Motion Compensation System
4736 Finite-Element Analysis of Bending in a Threaded Connector for a 5-1/2 in. Marine Riser

- Welding Technology

OTC
4740 Hyperbaric Welding at 300 MSW
4741 Underwater Friction Welding for Electrical Coupling of Sacrificial Anodes
4742 SATURNE Automatic System: Experience Gained on STATPIPE Project
4743 Laser Welding of Carbon Steel
4744 Strain Identification and Quality Control in Welded and Bolted Unions Using Nondestructive Optical Methods
4745 The Introduction of Real-Time Radiography for the Inspection of Butt Welds in Offshore Pipelines

Tuesday Afternoon
2 to 5 p.m.

- The Deep Water Well

OTC
4746 A Record Deepwater Drilling Program
4747 Geological Hazard Surveying in Water Depths of 2,000 Meters
4749 Improving Dynamic Positioning Performance in the Deepwater, High-Current, Rough Water Environment
4750 Marine Riser System for 7,500-Ft. Water Depth*
4841 A Comprehensive Approach to Deepwater Marine Riser Management*
4751 ROV Drilling Support for Deep Water
4748 Exploratory Well Design for 5,000 to 7,500-Ft. Water Depths, U.S. East Coast
*Combined into one oral presentation

- High Resolution Geophysics II

OTC
4719 The Use of Processed High-Resolution Seismic in Geotechnical Engineering
4753 Influence of Geologic Conditions in Selecting Production Structures in Main Pass 75
4754 Time-Lapse High-Resolution Seismic Surveys in the Mississippi Delta Mudflow Area Offshore Louisiana
4755 Geotechnical Characteristics of Shallow Ocean Dredge Spoil Disposal Mounds
4756 The Use of Vertical Seismic Profiling in Geotechnical Site Investigation
4757 Operational Aspects of Borehole Emplacement of a Marine Seismic System in Deep Water

- Platform Construction

OTC
4758 The Iwaki Platform in Japan: The Influence of Severe Earthquake

4759 The Rapid Installation of a Large North Sea Jacket Over a Subsea Template
4760 Design and Installation of Subsea Structures
4761 Toppling Technique Applied to Platform Removal in Rigs to Reef Program
4762 Field Results of Curved Conductors in the Main Pass Area, Offshore LA
4763 Ultrasonic Inspection of the Tension Leg Platform Tension Leg Components

• Mooring and Anchoring

OTC
4764 Failure Analysis of a Calm-Buoy Catenary Anchor Chain System
4765 Wear of Nylon Hawsers Over Rollers, Pulleys, and Fairleads
4766 Fatigue of Marine Hawsers
4767 Axial Corrosion Fatigue of Wire Rope
4768 An Experimental Study of Drag Anchors and Implications for OTEC
4769 Soil Resistance to Stud-Link Chain

• Corrosion Fatigue

OTC
4770 Seawater Corrosion Fatigue of 2-1/4Cr-1Mo and 4130 Steels for Marine Riser Applications
4771 Analysis of High-Cycle Corrosion Fatigue of Tubular Joints in Marine Environments
4772 Comparative Evaluation of Fracture Mechanics Methodologies as Applied to Offshore Structural Design and Integrity Analyses
4773 Evaluation of Spectrum Fatigue Data Under Conditions Applicable to Welded Steel of Offshore Structures
4774 Fatigue Design Considerations for Deepwater Fixed Platforms
4775 Combined Hot-Spot Stress Procedures for Tubular Joints

• Marine Minerals Mining

OTC
4776 Rift and Hydrothermal Venting Processes Along the Gorda-Juan de Fuca Ridge System
4777 Ore Assays of Massive Sulfides From Three Spreading Centers
4778 Geological Perspectives of Metalliferous Sulfides: Offshore Exploration in the Gorda Ridge Area
4779 A Development Scenario for Mining in the Gorda Ridge Area
4780 Atlantis-II-Deep's Metal Reserves and Their Evaluation
4781 Methodology for Mineral Resources Inventory in the EEZ Applied to a West African Coastal Zone
4782 Research and Development Project of Manganese Nodule Mining System in Japan

Wednesday Morning
9 a.m. to 12 noon

• Lithology and Seismic Reflectivity

OTC
4783 A Comprehensive Method for Synthetically Evaluating the Design of Airguns and Airgun Arrays
4784 Seismic Amplitude Measurement for Primary Lithology Estimation (SAMPLE): Case Histories From Tertiary Western Basins
4785 Lithology From Angle-Dependent Reflectivity: A Panel Discussion

Circle 192 on Reader Service Card ►

• Floating Production I

OTC
4786 Offshore Methanol Production: Selection of Carrier Types for Different Plant Capacities
4787 Suitability of Tankers for Floating Production Systems in Hostile Environment
4788 Tazerka Floating Production System: The First 18 Months
4789 Impact of Subsea Maintenance Activities on Floating Production Facilities in Deep Water
4790 Restraints Influence Topside Facility Design

• Drilling and Completions

OTC
4791 Offshore and Onshore European Horizontal Well Behavior
4792 Time Limitations of Spotting Fluids Used to Free Stuck Drillstrings
4793 The Use of Positive Displacement Motors for Installing Structural Casing
4794 Improved Wellhead Connector Design-Preload Production and Maintenance
4795 Effective Diversion During Matrix Acidization of Water Injection Wells
4796 Optimization of Gravel Pack Techniques: Main Pass Area

• Arctic Drilling Units

OTC
4797 New Generation Arctic Drilling System: Overview of First Year's Performance
4798 Second Generation Arctic Platforms: Lessons From First Generation Design Experience

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OTC '84

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4799 Development of a Structural Concept to Resist Impacts From Multiyear Ice Floes, Ridges, and Icebergs

4800 The Arctic Cone Exploration Structure: A Mobile Offshore Drilling Unit for Heavy Ice Cover
4801 The Concrete Island Drilling System: Super Series (Super CIDS)
4802 Gloryhole Excavations in the Beaufort Sea

• Foundations

OTC
4803 Experience With Driving 84-In. Piles With Underwater and Abovewater Hammers at the South Brae Platform, North Sea
4805 Comparison of Drivability Studies With Dynamic Measurements of Piles at Four Sites in Gulf of Mexico
4804 Equivalent Nonlinear Foundation Method for Pile-Founded Structures
4806 A Specialized Design and Research Tool for the Modeling of Near-Field Pile/Soil Interaction
4807 The Hutton TLP Foundation Design
4808 Centrifuge Modeling of Shallow Foundation on Soft Soil

• Wave Forces

OTC
4809 Extreme Wave Conditions in the Central North Sea
4810 Shallow Wave Forces on Offshore Structures
4811 A Numerically Efficient Technique for the Simulation of Random Wave Forces on Offshore Structures
4812 Application of Nonlinear Digital Filters to Modeling Low-Frequency Nonlinear Drift Oscillations of Moored Vessels in Random Seas
4813 On the Low-Frequency Hydrodynamic Damping Forces Acting on Offshore Moored Vessels
4814 Nonlinear Wave Interaction With a Moored Floating Cylinder

Wednesday Afternoon
2 to 5 p.m.

• Seismic Technology

OTC
4815 Deep-Towed Array Geophysical System Telemetry Equipment
4816 Acoustic Tracking of Towed Bodies
4817 Seismic-Derived Acoustic Velocities: A Panel Discussion

• Floating Production II

OTC
4819 Floating Production Systems for North Sea Marginal Fields
4820 Design Considerations of a Subsea Control System for a Floating Production System
4821 Articulated Production Tower for Deep Water
4822 Highly Compliant Column for Tanker Mooring and Oil Production in 1000 m Water Depth
4823 Hutton Tension Leg Platform: An Exercise in Weight Control

• Risk and Reliability

OTC
4824 Turbulent Wind Loading and Dynamic Response of Jackup Platform
4825 A New Approach to Stress Concentration Factors for Tubular Joint Design
4826 Reliability Analysis of Offshore Structures Based on Murotsu's Matrix Method
4827 Some Recent Applications of Structural Reliability Theory in Offshore Engineering
4828 Ultimate Strength of Tubular Joints: Chord Stress Effects
4829 Effect of Plate Thickness in Fatigue of Welded Joints

• Wave and Current Loads

OTC
4830 Hydrodynamic Forces From Combined Wave and Current Flow on Smooth and Rough Circular Cylinders at High Reynolds Numbers
4831 In-Line Forces on Vertical Cylinders in Deepwater Waves
4832 The Hydrodynamics of a Model of a Vibrating Umbilical Cable
4833 Determination of Flow Kinematics Close to Marine Pipelines and Their Use in Stability Calculations
4834 A New Method to Evaluate Wave-Impact Forces on Offshore Structures
4835 Velocity Profiling in Strong Ocean Currents

• Foundations on Calcareous Soils

OTC
4836 Performance Assessment of Deep-Penetration Offshore Piles Driven Into Calcareous Soils
4837 Analysis of Laterally Loaded Piles in Coral
4838 Frictional Response of Piles in Calcareous Deposits
4839 Lateral Load Tests on Large Pipe Piles in Coral
4840 Jackup Rig Siting in Calcareous Soil

Hans Philipsen Appointed President And Chief Executive Officer At Voith

The board of directors of J.M. Voith GmbH of Heidenheim, West Germany, has appointed former board member **Hans Philipsen** president and chief executive officer. He began his career with Voith in 1955. Following a period as an application engineer in the Water Turbine Division, in 1963 he was appointed head of the Project Planning Department and senior engineer.

Since February 1967 Mr. **Philipsen** has been head of the Water Turbine and Marine Engineering divisions. In 1969 he was appointed corporate executive vice president, and in 1973 was named full managing director.

Elinca Systems To Be Installed On Five Tankers Of Chevron Shipping Fleet

U.K.-based Elinca Ltd. of Sheffield recently won a major order to install its systems, which control marine fouling and corrosion in ships' seawater systems, on five VLCCs owned by Chevron Shipping Company. The tankers to be protected are the Howard W. Bell, C.W. Kitto, Chevron London, Burnaby, and South America. Installation is expected to be completed in the spring of this year.

These installations will add to the considerable list of Elinca systems presently operating throughout the world. These include installations on drillships, jackups, and semi-submersibles, as well as other shipboard installations.

Elinca uses the electrolytic principle to protect pipelines and other seawater systems by means of a low impressed current fed from an automatic control panel to specially alloyed, sealed anodes fitted in pairs in suitable locations. In this case, the usual sea chest-located anode assembly has been adapted to a housing above the sea chest, and the "treated" water is then piped from the housing into the sea chest, to flow throughout the system. Anodes are also located in the scoop and on inspection doors in the condenser.

For additional information on the Elinca systems,

Circle 90 on Reader Service Card

Philadelphia Resins Offers New Bulletin On Its Wire Rope Socketing System

Stronger, more reliable wire rope assemblies are provided by a two-part liquid system for socketing wire rope. This pourable, resin socketing system provides elasticity at termination transition points to insure maximum resistance to shock loads.

Actual results of dynamic test loads are included in a new, four-page sales bulletin. This brochure explains how the resin socketing system, developed by Philadelphia Resins Corporation of Montgomeryville, Pa., cures quickly to provide 100 percent of the rated break strength of a wire rope, while eliminating installation hazards associated with poured zinc or babbitt.

After curing for less than an hour at 70 F or for only five minutes with a wraparound heater, Socketfast® will withstand severe environments from −65 to 200 F, and it will not be affected by electrolysis or immersion in most corrosive fluids.

For socketing boom pendants and other wire rope assemblies on cranes and other equipment, Socketfast combines ease of installation with substantial improvements in fatigue strength and shock resistance. This poured resin system also eliminates the need for acid etching and handling of molten metals. To replace wire rope assemblies in the field, the resin system allows standard sockets to be used over and over again by merely driving out cured cones with a drift pin.

For a free copy of the Socketfast brochure,

Circle 22 on Reader Service Card

New Lighting Systems Catalog Now Available From Rig-A-Lite Company

Rig-A-Lite Company's new product catalog, "Specialists," describes representative products in the firm's broad line of lighting systems, fixtures, controls, and switchgear. The illustrated catalog presents a range of fluorescent, mercury vapor, high-pressure sodium, and incandescent fixtures for many industrial uses. Individual models include drip-proof, explosion-proof, corrosion-resistant, shatter-resistant, and vibration-resistant types. Both ac and 12-volt dc models are featured.

Most Rig-A-Lite fixtures are Underwriters Laboratories listed, and many are certified by the Canadian Standards Association for use in hazardous locations. The company's electrical distribution equipment, including motor control centers and power switching centers, is also featured in the catalog.

For a free copy of the Rig-A-Lite catalog,

Circle 43 on Reader Service Card

FMC Introduces Two New Crawler Cranes And Heavy Lift Attachments

FMC Corporation's Construction Equipment Group recently introduced two new Link-Belt® lattice boom crawler cranes, the LS-818 and LS-1018, and also unveiled an innovative design in heavy lift attachments. Termed the LS-918HL, the heavy lift attachment for the existing LS-918 crawler crane increases its lift capacity from 400 tons to 700 tons. This new design also permits the 700-ton crane and attachment to travel from one location to another on the job site in an average time of five hours.

One of the new cranes, the 500-ton LS-1018, is the largest Link-Belt Crane ever built. It complements the existing 400-ton LS-918, which formerly was available only as a conventional lift crane or as a tower crane. Both of these models will utilize the breakthrough design in heavy lift attachments, increasing the capacity of either unit to 700 tons with the 160-foot boom at 80-foot radius.

The 300-ton LS-818 fills the rung above the existing 250-ton LS-718, the first in the Link-Belt large crane line that was introduced in 1976. Conventional heavy lift attachments for the LS-718 and LS-818 increase the capacity of either to 360 tons with basic 140-foot boom at 50-foot radius.

All four cranes are now available with conventional boom, tower, and heavy lift configurations—for a total of 12 models—rounding out the Link-Belt large crane line.

For further information on FMC's Link-Belt cranes,

Circle 86 on Reader Service Card

New Electrical Repair Firm Announced By B&A Marine —Literature Available

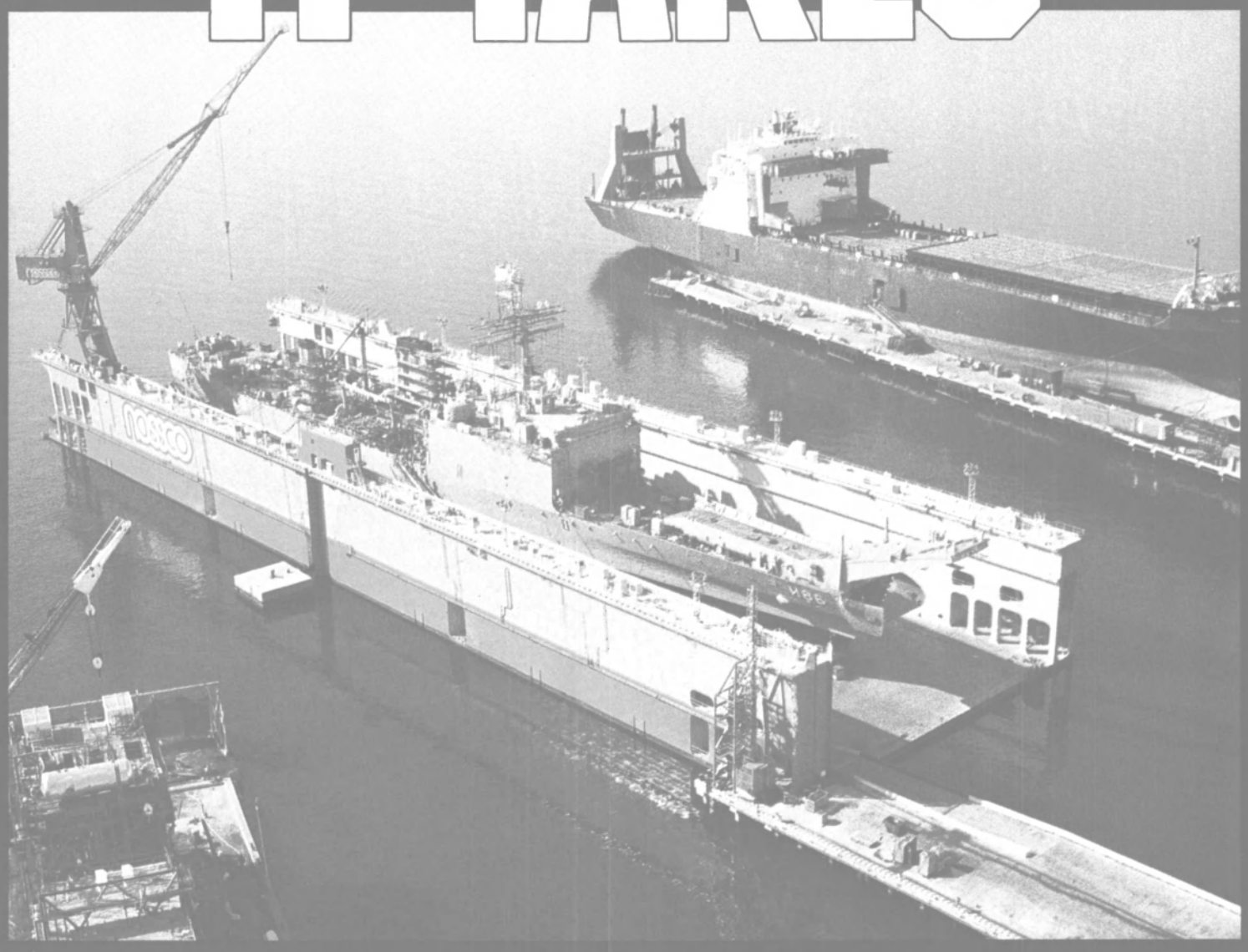
B&A Marine Co. Inc. of Brooklyn, N.Y., which recently expanded its 75 Huntington Street facilities has announced the opening of Northeast Marine Electric Corporation on its premises. The new company provides complete on-board and shop services by its certified marine electricians, including the rewinding of motors of up to 2,000 hp.

B&A Marine specializes in all phases of ship construction and repair work including mechanical and pump overhauls, engineering services, pipefitting, steelfitting, boilerwork and welding. As a full-service company, B&A Marine performs both voyage and pierside work in conjunction with its 24,000-square-foot machine shop.

For additional information on the services offered by both companies,

Circle 42 on Reader Service Card

WHATEVER IT TAKES



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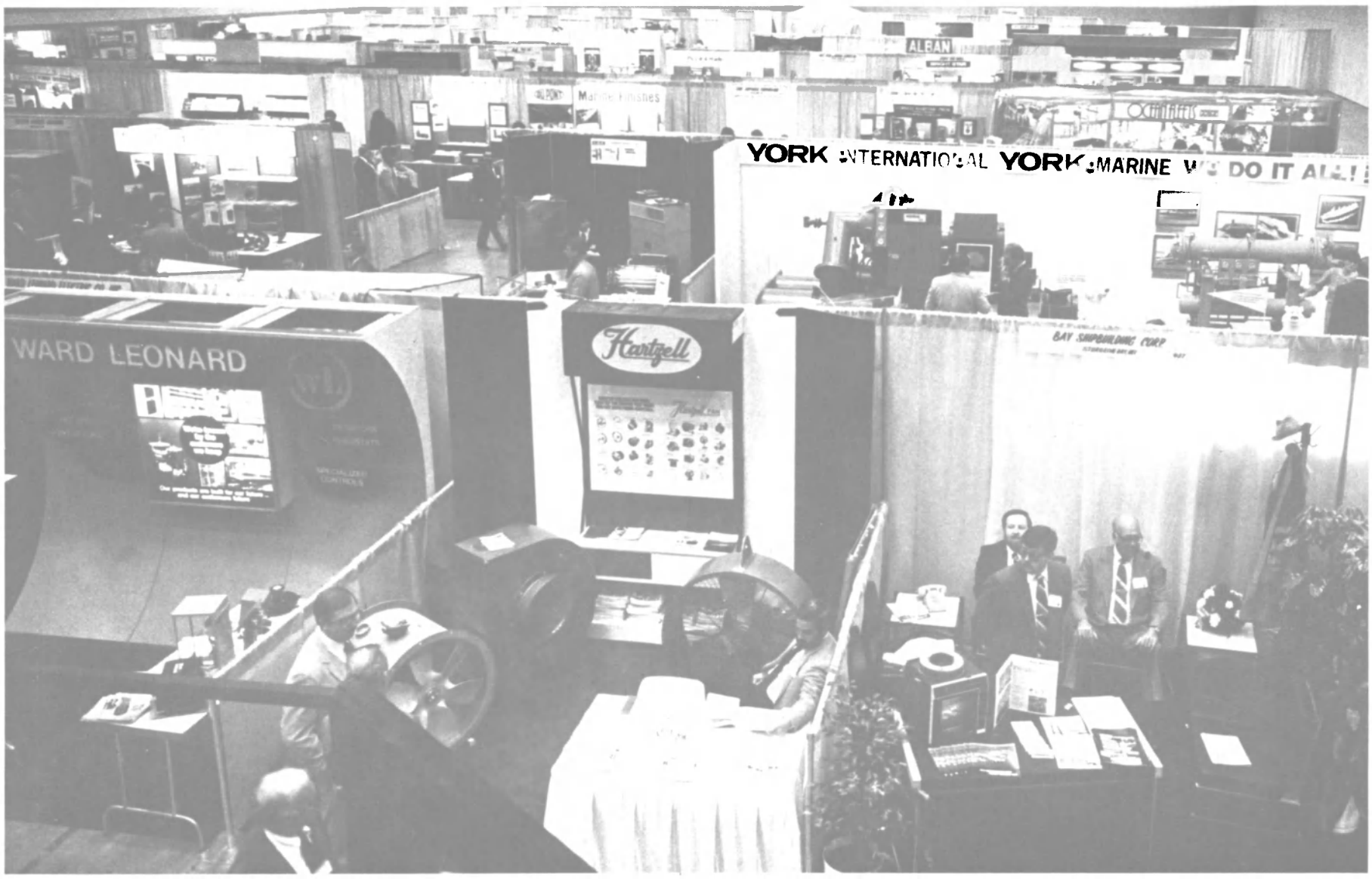

NATIONAL MARITIME SHOW

Houston, Texas — April 25–27

The Third Annual National Maritime Show and Conference will be held at the Albert Thomas Convention and Exhibition Center in Houston on April 25–27, 1984. Held previously in Baltimore in 1982 and 1983, the show's new location will provide exhibiting companies with access to a broad-based spectrum of clients available to the maritime industry. Houston is the third largest port in the United States and is the oil capital of the world. The state of Texas is home to more than 2,500 marine companies and some 85 shipbuilding and repair facilities.

The National Maritime Show covers the complete maritime market from tugboats to tankers and containerships, inland and offshore vessels, drilling rigs and support vessels, as well as Navy,

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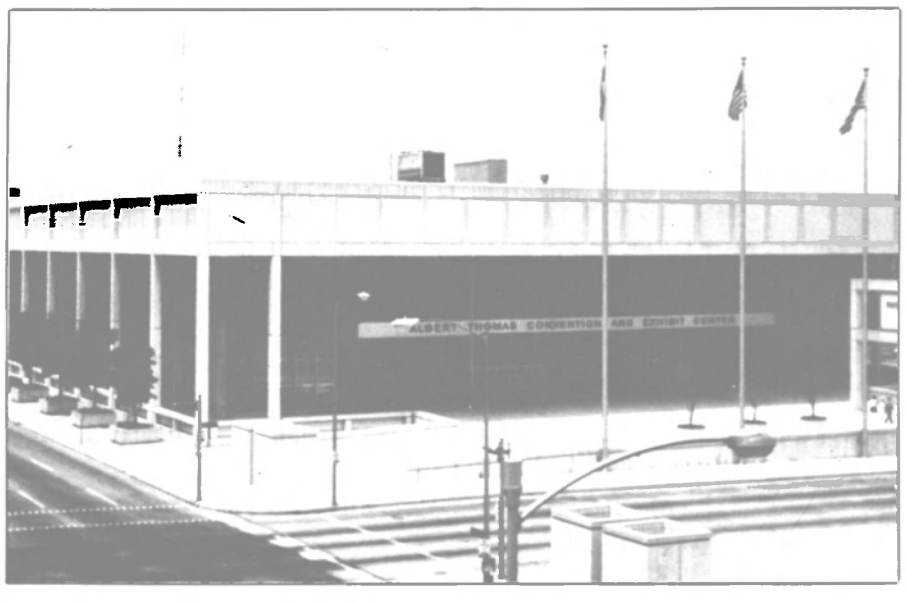

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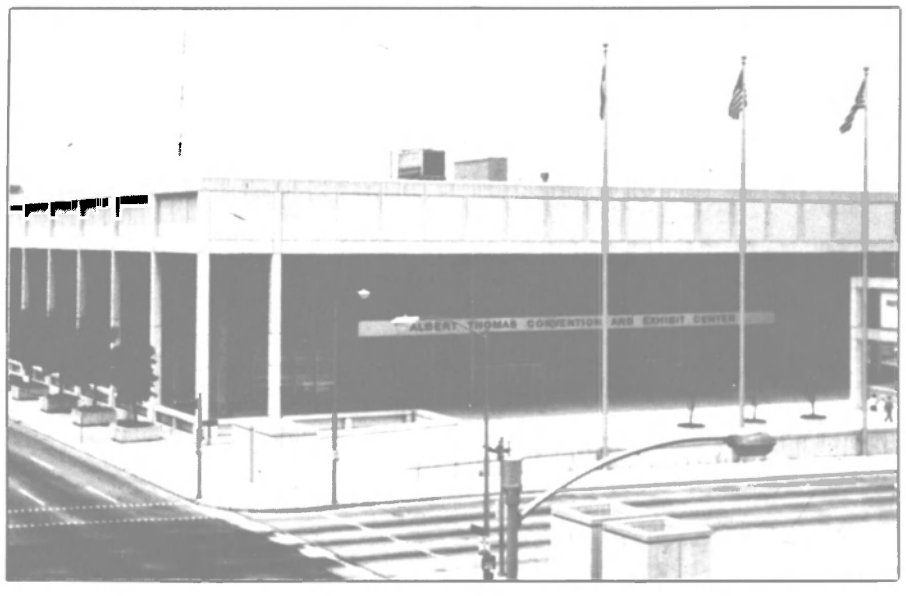

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National Maritime Show

(continued from page 84)

Coast Guard and other specialty ships.

The show is managed by Industrial Presentations, Inc. of Houston, a company that has presented major trade exhibitions throughout the world for more than 20 years, including 25 events held in North America, Europe, and the Far East. The company maintains branch offices in Denver, London, Rotterdam, Singapore, and Sydney.

Over the past few years Houston has hosted many successful events for the maritime and offshore industries, and has emerged as the hub for many international industries and headquarters for numerous multinational corporations. The city is easily accessible from all major centers in North America, and many international airlines offer direct service from Europe and South America.

The Conference that accompanies the National Maritime Show will open with a general session of forecasts and trends in the maritime industry, as well as the state of the art in propulsion, electronics, communications, and navigation. In addition, other sessions will cover offshore equipment and services; port equipment, construction, and maintenance; shipyard productivity and high technology; diving and salvage; and shipping operations.

More than 100 manufacturers and suppliers will display a wide range of products and services at the Albert Thomas Exhibition Center.

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Free Bulletin Describes Complete Line Of Kohlenberg Airhorns

A brochure describing the full range of Kahlenberg airhorns and accessories is available from the Two Rivers, Wisc., company.

Kahlenberg airhorns are distinctive, powerful signals backed by many years of successful performance. Horn projectors have been scientifically developed for volume, audibility, and richness of tone on the basis of musical instrument design and utmost economy of air consumption.

There are no moving parts other than the sound-producing diaphragm, and no adjustments for any operating pressure up to 250 psi. All horn castings are of bronze, accurately machined to interchangeable standards and finished in accordance with highest marine quality. Both polished bronze and chrome finishes are available.

For further information and a copy of Bulletin 88,

Circle 27 on Reader Service Card

Patterson Tensor™ Offers Lashing Speed And Safety — Literature Available

The Tensor manufactured by W.W. Patterson Company is a screw type, lashing loadbinder with eccentric loading. It introduces a new dimension to RO/RO vessel, containership, and other marine cargo lashings.

Tensor works with chain, cable, or rods; as the tensioning tool it can be substituted for an existing tool. It is so easy to tension manually with a standard ratchet socket wrench that no cheater bar is needed.

Application of either impact wrench or socket wrench telescopes the small tube inside the larger tube, pulling the anchoring point together. All working parts are completely enclosed, making the Tensor almost indestructible. All marine models are galvanized.

For further information and a free catalog on the Tensor,

Circle 24 on Reader Service Card

McDermott Delivers Two Caterpillar-Powered Supply Vessels To Tidewater

McDermott Shipyard's New Iberia Division recently delivered two 194-foot supply vessels to Tidewater Marine Service, Inc., a subsidiary of Tidewater Inc. The Jan Tide and the Abshire Tide are the seventh and eighth in a series of 10 supply boats being built by McDermott for Tidewater. The previous six vessels were 180 feet long; however, a contract change called for the last four boats to be lengthened 14 feet. The final two are scheduled for delivery during the first quarter of this year.

Jan Tide and Abshire Tide have a 40-foot beam, 14-foot molded depth, and design draft of about 12 feet. Each vessel admeasures less than 300 gross tons, and has below-deck storage capacity for 121,000 gallons of fuel oil, 11,000 gallons of potable water, 1,130 barrels of liquid mud or chemicals, and 4,000 cubic feet of bulk materials. Accommodations are provided for 23 personnel.

The new supply vessels are certified by the American Bureau of Shipping and the U.S. Coast Guard for service on any of the world's waters. They will be operated under the U.S. flag.

Twin Caterpillar D399 diesel engines power the vessels, generating a total of 2,250 bhp at 1,225 rpm. They are linked to Reintjes WAV 1440 reverse/reduction gears having a 4:1 ratio.

New Anti-Corrosion Paint Pigments Unveiled By BP

Scientists at BP's Research Centre at Sunbury-on-Thames, England, have succeeded in developing a family of new anti-corrosion pigments. These pigments, which have been widely patented, are based on the ion-exchange principle—a radical departure from existing technology.

Almost all metal fabrications such as offshore installations and bridges need to be protected from atmospheric corrosion by overcoating with anti-corrosion paints. Existing anti-corrosion paints generally contain corrosion inhibitors such as highly toxic lead or chromate compounds.

In contrast, the BP pigments have low or nil toxicity, and when formulated into paint primers outperform currently available products containing zinc phosphate, zinc chromate, red lead, etc., for similar costs. The BP pigments function by the principle of ion exchange. Aggressive ions, such as chloride, permeating the paint film are preferentially ion-exchanged with the solid pigment particles, releasing the active anti-corrosion agents that then protect the metal surface. As the anti-corrosive agents are released only when required, the BP system is said to last longer than traditional paints.

The low toxicity and improved performance of the BP pigments has already aroused considerable interest among paint manufacturers. BP will be launching these new materials through BP Ventures in the first half of 1984.

For further information on BP's new pigments,

Circle 19 on Reader Service Card

Westinghouse Secures U.S. Patent On Self-Protecting Sensing Cell Electrodes — Literature Available

The Combustion Control Division of Westinghouse Electric Corporation recently received a U.S. patent for its self-protecting electrodes in its Hagan, in situ flue gas sensing cell, and has incorporated this feature into the Hagen Model 240 excess oxygen/excess combustibles flue gas analyzer. Previously, patents on the self-protecting electrodes had been issued in Belgium, Canada, and the U.K.

This self-protecting feature establishes the Hagan analyzer as a highly reliable flue gas sensor. It is said to be particularly effective in combustion processes that experience reducing stack gas atmospheres containing sulfur.

Low excess air firing or fuel-rich conditions cause sulfur in the fuel to combine with platinum electrodes within the in situ sensor to form platinum sulfide, resulting in serious electrode deterioration. This condition presented problems to the traditional in situ excess oxygen analyzer in the past, particularly in those applications with reducing or high sulfur flue gas atmospheres. This patented self-protection feature of the Hagan excess oxygen/excess combustibles analyzer is an outgrowth of the successful model 218 and model 225 probe type analyzers. Westinghouse established the model 218 analyzer as the first in situ zirconium oxide excess oxygen sensor in 1971.

Just as in the traditional zirconium oxide excess oxygen analyzer, the new excess oxygen/excess combustibles analyzer requires no sample system, no sample probes, no scrubbers or pumps, and is suitable in flue gas temperatures ranging as high as 1,400 F (760 C). The sensor has a field-replaceable cell, with low installation and maintenance costs.

For further data and free literature on the new electrodes,

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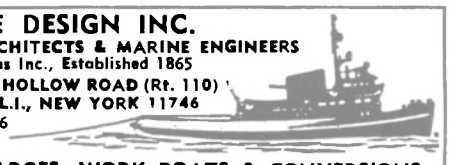

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Tuneable Hull Plate Reduces Propeller-Induced Noise/Vibration

Propeller-induced noise and vibration can be a serious problem particularly on smaller, higher-speed vessels. If intense enough, these foreign forces reduce power and fuel economy, add to the discomfort of passengers and crew and can negatively influence the operation of shipboard electronics and other equipment.

The problem is traceable to the ratio of propeller power to ship weight; as power increases on lighter weight ships, the problem is amplified.

One recent solution to the problem is a CIRR-PSA system (patent pending), developed by **Pal Francis Hansen,** that is designed to reduce the transmission of the propeller shocks into the hull structure of the vessel from 60 to 90 percent. The design is predicated on the vibration and shock absorbing characteristics of helical wire rope isolators supplied by Aeroflex International Corporation.

The CIRR-PSA system entails a box built into the hull immediately above the propeller tip, Figure 1. The hull plate of the PSA box has the same shape and contour as the surrounding bottom plating, and is flexibly mounted on helical isolators located inside the box, Figure 2. The flexible hull plate mass, combined with specific shock and vibration capabilities of the isolators, provides a specific damping level. To tune the system for any particular installation, it is only necessary to alter the hull plate mass and select the correct isolators.

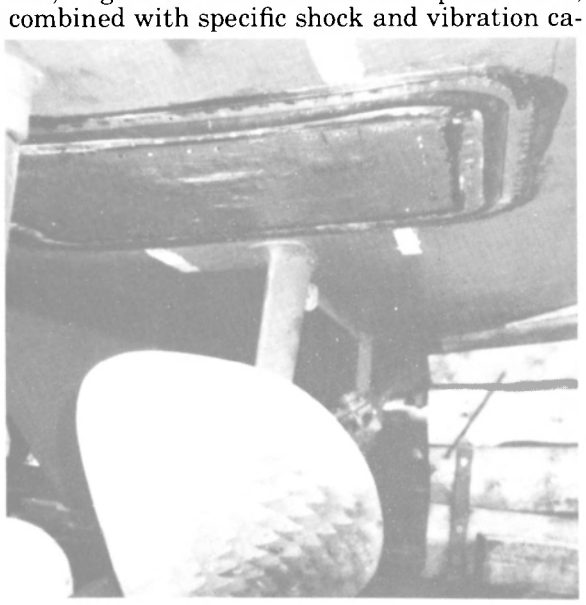

Figure 1—Shown as viewed from aft is the hull plate mounted above the propeller and the elastomeric seal surrounding the hull plate.

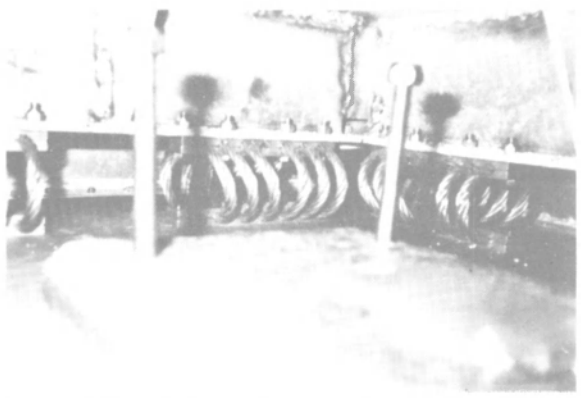

Figure 2—The 1.0 by 0.8 by 0.25 meter box houses the four-wire rope isolators. By adjusting hull plate mass and selecting isolators exhibiting specific damping characteristics, the system can be tuned for several ship sizes.

Propeller-induced turbulance establishes force levels acting upon the hull plate. The hull plate moves against the counter force produced by the isolators, reducing the amount of vibration that migrates into the ship's hull.

Acceleration measurements in the aft body have shown up to 90 percent reduction of vibration amplitudes after installation of the flexible-seated PSA hull plate in the nearby structure at specific propeller-blade frequencies.

The helical isolators are sealed inside the box by a special watertight double rubber seal. The elastomer material is flexible enough to permit smooth movement of the hull plate with low drag at the point of isolation force crossover.

Helical wire-rope isolators are stable mounting assemblies of stranded-steel wire rope formed between metal retainers, Figure 3. Their large dynamic displacement attenuates heavy shocks, while their inherent damping enables them to absorb and dissipate large amounts of low- and high-frequency vibration. Of particular importance for motion control at resonance is their flexure hysteresis.

Damping characteristics are related to the strain applied to the isolator. Large motions are highly damped, whereas small amplitude motion is moderately damped with the isolator appearing to act as a nonlineal element. The cable is wound in a helical fashion between two metal bars to assure shock and vibration control, regardless of the direction of applied force.

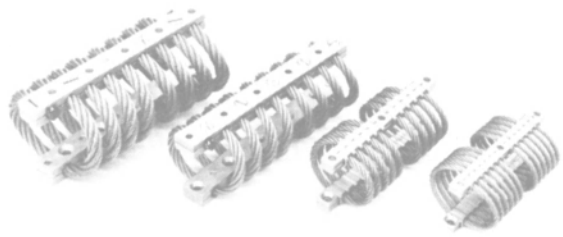

Figure 3—The helical isolators are stable mounting assemblies of high-quality stranded wire rope held between metal retainers. Each isolating element has specific response characteristics determined by its design.

The helical cable isolators resist destructive environments because they are made entirely of stainless steel or stainless-steel and corrosion-resistant aluminum alloy; or even more exotic metals such as Inconel. The isolators require little or no maintenance and usually will outlast the equipment they isolate. They also can be painted to match equipment.

A prototype of the system is in operation onboard a new high-speed rescue vessel, R/S Olav V, operated by the Norwegian Sea Rescue Service. The vessel is equipped with twin 1,500-hp engines; propellers have a 1.20 meter diameter.

The CIRR-PSA system will be delivered with isolators, seal and an engineering package with all technical data necessary to build a PSA system for a specific project.

For more information on the system,

Write 40 on Reader Service Card

Swiftships To Build Three Patrol Boats For Jamaica

Jerry L. Hoffpauir, president of Swiftships, Inc., Morgan City, La., recently announced the receipt of a letter of intent from the Government of Jamaica for the construction of one 140-foot patrol vessel and two 42-foot patrol boats.

The successful design and construction of a variety of patrol boats tailored to the specific needs of governments around the world has established Swiftships as a worldwide leader in this field.

In addition to its Morgan City facility where these boats will be built, Swiftships has a yard at Pass Christian, Miss., that builds larger steel vessels, and a shipyard in Singapore that specializes in steel or aluminum construction of military and oilfield support type vessels. The company also provides repair services at facilities in Lafitte, La., and Freeport, Texas.

The 340-foot cable ship Salernum.

Tracor Marine Awarded $6-Million Contract To Convert AT&T Cable Ship

Tracor Marine of Port Everglades, Fla., a subsidiary of Tracor, Inc., has received a contract that will bring the company $6 million over the next 12 months from Transoceanic Cable Ship Company, Inc., a wholly owned subsidiary of AT&T. The award was announced by **William C. Moyer,** group vice president of Tracor Applied Sciences.

The contract calls for major conversion of Transoceanic's newly acquired cable ship Salernum. The 340-foot vessel was purchased from the Italian shipping firm of Fratelli d'Amico Amatori for a reported $7 million, and recently completed the transit from Naples to the Tracor Marine shipyard.

The conversion is required in order to qualify the ship for U.S.-flag registry, as well as to enable her to meet U.S. Coast Guard engineering and safety standards. The vessel will undergo major renovation of the habitable areas, and the electrical system will be converted from dc to ac.

Upon completion of the project, home port of the Salernum will be Honolulu, and the Port of Registry will be New York. The vessel will assume cable-repair and cable-laying duties in the Hawaiian Islands. A standby crew of 20 will expand to 50 during active duty.

The Tracor Marine facility at Port Everglades is headquarters for the Shipyard and Ocean Technology Engineering divisions. The full-service shipyard is equipped for the overhaul, conversion, and repair of government and commercial vessels.

Among the capabilities offered by the oceanographers, naval architects, and engineers of the Ocean Technology Division are marine design and engineering, including fabrication and installation of underwater systems; detailed marine surveys; program management; and cable laying. In addition, a Marine Services Division of Tracor Marine maintains facilities in Chesapeake, Va., where marine engineering and ship repair work, diving and underwater services, ship and aircraft salvage, and industrial fabrication are provided for the marine industry in the Norfolk/Tidewater area.

Tracor, Inc. is an international technological products and services company with headquarters in Austin, Texas.

Norshipco Awarded $39-Million Navy Contract For AO-177 Maintenance

Norfolk Shipbuilding and Drydock Corporation, Norfolk, Va., has been awarded a $38,989,397 cost-plus-fixed-fee contract for the AO-177 Class fleet oiler phased maintenance program. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

New Orient Overseas Line Ships Will Be Powered By Sulzer RTA76 Diesels

The C.Y. Tung group recently ordered two 2,500-TEU, fully cellular containerships from Mitsubishi Heavy Industries for Orient Overseas Container Line (OOCL) services. To be completed in the first half of 1985, the ships will each be powered by a nine-cylinder Sulzer RTA76 diesel engine with maximum continuous rating of 29,610 bhp (21,780 kw) at 95 rpm.

With this order, OOCL is to have five containerships powered by fuel-efficient RTA superlongstroke engines. The other three are 2,300-TEU steam turbine ships being re-engined in Japan, also with 9RTA76 diesels. The Oriental Educator (ex Seapac Lexington) was re-delivered by Mitsubishi in December 1983. Kawasaki Heavy Industries re-delivered the Oriental Explorer (ex Seapac Princeton) in March of this year, and the Oriental Executive will follow from the same yard in July.

These machinery conversions are expected to achieve fuel savings of about 37 percent at the same service speed of 19½ knots.

Nationwide Boiler Awarded $1.8-Million Navy Contract To Upgrade Steam Plants

The U.S. Navy has awarded a $1,775,000 fixed-price contract to Nationwide Boiler Inc. of Fremont, Calif., for the refurbishment of seven mobile steam plants. The period of performance extends from February 1984 to June 1985. The contract calls for redesign and complete reconditioning of the steam plants, which were manufactured in the early 1970s. Project manager for the refurbishing is **Jeffery J. Shallcross,** Nationwide's vice president of engineering.

Each steam plant is mounted on a 40- by 8-foot trailer, and contains four boilers with a combined capacity of 20,000 pounds per hour of steam. Each unit also has a fuel tank, feedwater treatment system, chemical feed system, and central control panel. A complete test program will be conducted on each steam plant prior to redelivery to the Navy.

Mobile steam plants are used at Navy facilities around the world to provide ship's services, such as laundry and heat, when vessels are in port. The units are capable of being transported in a U.S. Air Force C5A transport aircraft.

The Naval Environmental and Energy Support Activity at Port Hueneme, Calif., is the contracting activity.

Full-Color Worthington Brochure Covers Specs Of Redesigned Pumps

Worthington's redesigned line of general-purpose end-suction pumps, with capacities to 1,500 gpm, is covered in a new brochure.

The cast-iron pumps, designated as the D-800 line, are available in 19 sizes, frame-mounted or close-coupled. The pumps are designed for minimum operating and maintenance costs.

Features include a bell-shaped mechanical seal cover for improved seal life and frame-mounted pump bearings, sealed for life and pre-lubricated. Other advantages cited for the pump include back-pullout for access to pump internals without disturbing the piping, integral adapter seal cover for added pump rigidity, dry rabbet-fit at the casing joint, and top centerline discharge to simplify piping and remove stress on the bearing frame.

The D-800 has applications in all industries, including process, power generation, and HVAC systems. Liquids pumped include water, solvents, light oils, noncorrosive chemicals, coolants, and brine. The pumps will deliver liquid to heads of 400 feet (100 meters).

For a free copy of the brochure, which gives specifications, materials of construction, and technical data,

Circle 35 on Reader Service Card

MSC Awards Biospherics Contract For 40 Oilarms — Option For 40 More

Biospherics Incorporated, Rockville, Md., known for its rugged sewage treatment plant instrumentation, is going to sea with a versatile new oil discharge monitor, the Oilarm. Applying its know-how for making things work in harsh environments, the firm has turned out a tough, well-tested and economical device approved by the U.S. Coast Guard.

Biospherics was awarded a contract for the Oilarm by the U.S. Navy's Military Sealift Command. Under terms of the award, Biospherics will supply a minimum of 40 Oilarms with an option for an additional 40. Spare parts, options and other aspects of the award constitute a potential sales value of approximately $250,000. The Biospherics bid was part of a larger one by the prime contractor, Sigma Treatment Systems, Inc., Chester Springs, producer of the oily water separator selected by the MSC to separate the oil prior to discharge of the bilgewater.

"We are pleased at the dollar value of the sale," said Dr. **Gilbert V. Levin,** Biospherics' president. "But we put even greater stock in the fact that the Biospherics instrument was selected for the first fleet purchase of oil-in-water detectors."

Virtually all vessels in excess of 10,000 gross tons will have to install oil-in-water separatory and detection equipment. Overboard discharges of more than 100 parts per million of oil at sea and 15 parts per million in coastal waters and harbors are prohibited by the recently ratified United Nations Maritime Treaty.

For free literature on Biospherics' Oilarm,

Circle 38 on Reader Service Card

Aeroquip Offers Catalog On Hydraulic Cylinders

Aeroquip Corporation's T-J Division announces the availability of Series SH Hydraulic Cylinder Catalog, No. 4055. This catalog contains information on Aeroquip's complete line of cushioned and non-cushioned, high-pressure hydraulic cylinders. Cylinder sizing, selection data, and maintenance information are included in its 136 pages.

Aeroquip Series SH cylinders are NFPA interchangable, featuring hard chrome bodies and piston rods at no extra cost. The QC-100 quick-change rod bearing is a standard Aeroquip cylinder feature, permitting easy replacement of rod seals without disassembling the complete cylinder.

Customers may choose from 22 mounting styles and a wide variety of bore sizes, ranging from 1½ through 14 inches, with 3,000 psi nominal pressure rating.

For a free copy of Catalog 4055,

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We offer at: $19,000 each.

(4) 100 ton York model centrifugal air conditioning units complete with condensers and chillers - packaged unit with 125 H.P., 440 V., A.C. sealed motor - all self contained. Marine type, Model MTC59. New cost approximately $90,000.

We offer at: $10,900 each.

(2) New Carrier model 7G8 15 ton compressor complete with 25 H.P., 440 volt, AC motors with condenser and spare parts. New price - $18,000 each.

Our price: $5,000 each.

REDUCTION GEARS

(4) Reconditioned Farrel Birmingham - 3600 H.P., 2 pinion reduction gears 3.6 to 1 - 900 RPM input, 225 RPM output - Equal to new - $7,500 each.

(3) New - Farrel Birmingham Destroyer Escort Gears, 6000 H.P. 29 to 1 - $15,000 each.

(5) Reconditioned General Electric S234 reduction gears 4950 - 1750 RPM - 700 - 1000 H.P. - $4,500 each.

(1) New - Luftkin Reduction Gear - 1000 H.P. 4000 to 1750 RPM for Skinner Turbine - $3,500.

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(5) 500 KW Allis-Chalmers, G.E. designed, Dorv 325 with reduction gear to 500 KW, 440 volt, A.C. Allis-Chalmers 1200 RPM generator, Steam 450 to 600 lbs. Used, in excellent condition. $8,500 each.

(2) 750 KW, G.E. turbo generators, FSN3-24 with 750 KW, 1200 RPM generators. Used, in good condition. $15,000 each.

(1) New Elliot 75 KW, 120 lbs. steam pressure, 5" exhaust diameter. G.E. 75 KW, 1800 RPM, 440 volt with exciter. This unit is new and we offer it at $3,900.

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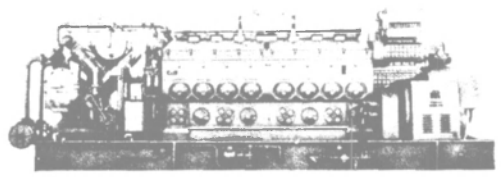

We have in stock (1) equal to new 1500 KW, General Motors model - 645E9, 900 RPM, 440 V., A.C. Heat Exchanger, cooled diesel generator set. This unit was manufactured in 1979 and was used for one year as an emergency diesel generator set. It is equal to new in all respects with less than 2000 hours. The original cost was $269,000. Today's price is approximately $300,000.

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(1) 125 KW, G.M. model 671, emergency diesel generator set, radiator cooled, 440 volt, 1800 RPM Delco generators. New price - $21,000 each. Our price, rebuilt and guaranteed, $9,500 each.

(2) Enterprise DSG6 12 x 15 generators, used, with 250 KW Elliot generators. Used for parts. $5,500 each.

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3) Coffin Type F, 200 GPM at 600 lbs. head, used, in excellent condition. $2,500 each.

(2) Coffin Type T tanker feed pumps, capacity 250 GPM at 350 PSI. Used, in excellent condition. $3,500 each.

(5) Coffin Type GG feed pumps, capacity 300 GPM at 750 PSI. Used, in excellent condition. $4,500 each.

(2) Coffin Type DE feed pumps, capacity 500 GPM at 950 PSI. Used, in excellent condition. $7,500 each.

(2) Coffin Type DEB feed pumps, capacity 800 GPM at 1150 PSI. Used, in excellent condition, $9,500 each.

(2) Worthington Type 4UNVX10 pumps, capacity 516 GPM at 950 PSI with Worthington S2R turbines. $7,500 each.

(2) Pacific pumps, 500 GPM at 1000 PSI. $7,500 each.

NEW APPLETON ELECTRO HYDRAULIC CRANES

(2) New marine electro hydraulic deck or stationary cranes, manufactured by Appleton - 300 H.P. Capacity 17 ton at 54' - 32 tons at 25' - complete with motors and controls. Completely self contained. 345° turning. Original cost: $239,000 each. Our price: Less than one-third.

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(1) 15000 horsepower turbine, Bethlehem Steel.
(1) 19000 horsepower T-5, Westinghouse turbine, HP.
(1) 8500 horsepower Westinghouse HP turbine.
(1) 8500 horsepower Westinghouse LP turbine.
(1) 22000 horsepower Delaval HP turbine for T-5 vessel.
(1) 22000 horsepower Delaval LP turbine for T-5 vessel.
(1) 32000 horsepower G.E. LP rotor

For the auxiliary turbines:

(4) 1500 horsepower G.E. turbines with reduction gear.
(8) 700 horsepower G.E. turbines with reduction gear.
(2) 1000 horsepower Skinner turbines with reduction gear to 1800.

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Meeting Of SNAME Great Lakes/ Great Rivers Section Discusses Fuel Additives And Hull Springing

The winter meeting of the Great Lakes and Great Rivers Section of The Society of Naval Architects and Marine Engineers was held at the Holiday Inn-French Quarter in Perrysburg, Ohio.

The first paper, presented by **Mike Bisaillon** of Aderco, Inc., Boisbriand, Quebec, was titled "Fuel Oil Additives: A Solution to Quality Problems of Modern Fuels." The thrust of his discussion was to present a possible solution to the problems encountered when matching availability of fuels to compatibility of modern equipment needs imposed by changes in the world market and refining. Evidence of the interest in this problem was apparent by the many questions following presentation of the paper.

Mike Bisaillon

Armin Trosch

Prof. **Armin Trosch** of the University of Michigan presented a paper titled "Effects of Non-Linearities on Hull Springing." He discussed the unique design challenge presented to the marine community by the long, flexible hulls and low draft/beam ratios of 1,000-foot bulk carriers on the Great Lakes, and the springing encountered in moderate seas. The occurrence of this springing caused the design agencies and regulatory bodies to re-evaluate the existing strength standards for Great Lakes vessels. An active question and answer session followed this presentation also.

Following a coffee break, students from the department of Naval Architecture at the University of Michigan presented their senior design project. Presenting some unusual designs dealing with contemporary problems were: **Paul Kopp** and **Tom Allen,** "Modern Commuter Ship"; **John Hardiman,** "Multi-Use Commercial SWATH"; and **Paul Rautenberg,** "Advanced Submarine Concept Design."

Following lunch the attendees toured the MarAd Great Lakes Fire-Fighting Training Center.

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T.A. Cuomo, group vice president, worldwide marine operations, remarked, "We are grateful to all those who would devote their own time to share with us the introduction of our exciting new products. These additions to our product line are prime examples of our continuing efforts to meet the needs of the marine industry through research and technology and a commitment to superior service."

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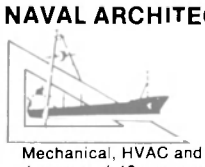

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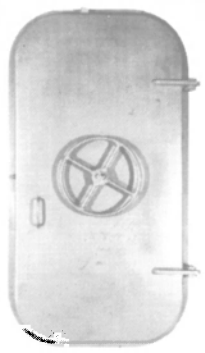

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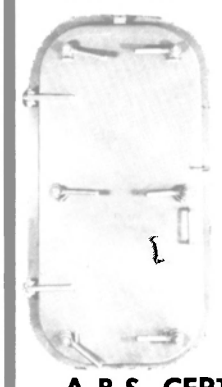

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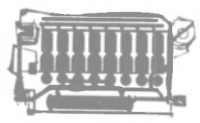

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156	GRUMMAN AEROSPACE	SHIP CONTROL SYSTEMS
165	GULF PUBLISHING COMPANY VIDEO	VIDEOTAPE TRAINING PROGRAM
230	HBC BARGE, INC	BARGE BUILDING/REPAIR
200	HAMBURG MEESE und CONGRESS GmbH	TRADE SHOW/CONFERENCE
146	HAYWARD MARINE	STRAINERS/VALVES/FITTINGS
125	HYDE PRODUCTS, INC	OIL/WATER SEPARATORS
171	HYDRO-CRAFT, INC	TUBE/PIPE CLAMPS
134	I & I SLING CO	WIRE ROPE SLINGS
216	IMPERIAL MANUFACTURING	SURVIVAL SUITS
121/211	INTERTRADE INDUSTRIES	BUOYS/FENDERS
231	JERGENS	ELECTRIC RING HEATER
122	JIM'S PUMP REPAIR	PUMPS
139	KAMEWA	PROPULSION SYSTEMS
135	KING RADIO	HF/SSB RADIO
207	MICHAEL LAURIE & PARTNERS	REAL ESTATE
162	LIPS PROPELLERS	PROPULSION SYSTEMS
105	McALLISTER BROS	TOWING SERVICES
128	M.A.N.—B&W DIESEL	DIESEL ENGINES
194	MAGNUM DISTRIBUTORS	ANTENNA MATCHERS
173	MAGNUS MARITEC	CORROSION INHIBITORS
178	MAIN IRON WORKS	VESSEL CONSTRUCTION/REPAIR
157	MARINE EQUIPMENT CATALOG	ANNUAL MARINE/NAVY CATALOG
108	MARITIME INDUSTRIES LTD	PROPULSION SYSTEMS
213	MARITIME POWER	MARINE EQUIPMENT
140	MASONITE CORP	JOINER PANELS
220	MIDLAND AFFILIATED CO	MARINE TRANSPORTATION/SUPPLIES/ SHIPBUILDING & REPAIR/TERMINAL OPERATORS
143	MIDLAND-ROSS CORP., RUSSELLSTOLL DIV	NAVIGATION LIGHTS
127	MILLER ELECTCIC MFG. CO	WELDING SYSTEMS
226	E. MOCK & SONS	MARINE CLOSURES
176	LUCIAN Q. MOFFITT, INC	BEARINGS
113	MORAN TOWING & TRANSPORTATION	TOWING SERVICES
181	MURDOCK MACHINE & ENGINEERING	ROPE TENSION DAMPER
227	NATIONAL FISHERMAN EXPOSITIONS, INC	TRADE SHOW/CONFERENCE
124	NATIONAL MARINE SERVICE	SHIPYARD SERVICES/TOWING SERVICES
144	NATIONAL STEEL & SHIPBUILDING CORP.	VESSEL CONSTRUCTION/REPAIR
198	NAV-VUE, INC	COMPUTER DISPLAY SYSTEM
148	J.D. NEUHAUS	AIR HOISTS
115	OFFSHORE TECHNOLOGY CORP	VESSEL MOTION MONITOR
106	OMNITHRUSTER	THRUSTERS
109	PALMER PRODUCTS	NON-SLIP COATING/CHOCKING COMPOUNDS
126	PETROCHEMICAL SERVICES, INC	SHIP, BARGE & TANK CLEANING
116	PHILADELPHIA RESINS CORP	CHOCKING COMPOUNDS
161	PHOENIX PRODUCTS	LIGHTS/SEARCHLIGHTS
219	PRODUCTS RESEARCH & CHEMICAL CORP	DECK COATING SYSTEMS
203	PROPULSION SYSTEMS, INC	THRUSTERS
197	RAUMA-REPOLA	VESSEL CONSTRUCTION/REPAIR
131	SKF STEEL	COUPLINGS
206	SAMSON OCEAN SYSTEMS	MOORING SYSTEMS
154	SEAGUARD	MARINE PAINTS/COATINGS
187	SEAWARD INTERNATIONAL	FENDERS
138	SELBY, BATTERSBY & CO	DECK COVERING/SHEET RUBBER
202	SIMPSON TIMBER COMPANY	MARINE PANELS
222	SIMS PUMP VALVE CO	IMPELLERS/CASING RINGS
218	SOUTHWEST MARINE, INC	VESSEL CONSTRUCTION/REPAIR
192	STAL REFRIGERATION	REFRIGERATION/AIR CONDITIONING
117	STANDARD COMMUNICATIONS	HANDHELD MARINE RADIOS
133	STOCKHAM VALVES & FITTINGS	VALVES/FITTINGS
136	SUDERMAN & YOUNG TOWING CO	TOWING SERVICES
224	THOMAS MARINE	VESSEL CONSTRUCTION/REPAIR
180	TODD SHIPYARDS	VESSEL CONSTRUCTION REPAIR
151	TOTAL TRANSPORTATION SYSTEMS	SHOT BLAST/PAINT SYSTEM
169	TRANSAMERICA DELAVAL-GEMS SENSORS	TANK LEVELING INDICATORS
130	TRANSAMERICA DELAVAL-PYRAMID PUMP DIV	CARGO PUMPS
195	TURBINE SPECIALTIES	TURBOCHARGER REPAIR & PARTS
214	TURECAMO COASTAL & HARBOR TOWING	TOWING SERVICES
193	ULSTEIN TRADING LTD	GEAR BOXES/PROPELLERS/THRUSTERS
196	UNITED STATES P & I AGENCY, INC	MARINE INSURANCE
147	UNITED TECHNOLOGIES ELLIOT	THRUSTERS
152	VEROLME DO BRAZIL	VESSEL CONSTRUCTION/REPAIR
204	WACO INC	INSULATION/FABRICATION/FIREPROOFING
119	WALL INDUSTRIES, INC	MARINE ROPE
155	WALZ & KRENZER, INC	SLIDING DOORS/CONTROLS
175	WARTSILA DIESEL	DIESEL ENGINES
205	WASHINGTON CHAIN & CABLE SUPPLY	HEAVY DUTY RELEASE HOOKS
158	WAUKESHA BEARINGS CORP. (THORDON)	BEARINGS
177	WAY WOLFF ASSOCIATES	SHIP HEATERS
141	WELDED BEAM CO	WELDED BEAMS
179	WILDEN PUMP & ENGINEERING CO	PUMPS
191	ZIDELL MARINE GROUP	OCEAN BARGES

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) 689-3266.**

AIR COMPRESSORS
Flexaust Company, 11 Chestnut St., Amesbury, MA 01913
Squire Cogswell Company, 3411 Commercial Ave., Northbrook, IL 60062

AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION
Bailey Refrigeration Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Cospolich Refrigerator Co., Inc., 949 Industry Rd., Kenner, LA 70062
Flakt AB, Box 8862, S–40272, Gothenburg, Sweden
Marlo Coil/Nuclear Cooling, Inc., P.O. Box 171, High Ridge, MO 64049
Mechanical Resources, Inc., 210 West Side Ave., Jersey City, NJ 07305
Nance Industries, P.O. Box 1547, Beaumont, TX 77704-1547
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrkoping, Sweden
United Technologies Carrier Transicold, P.O. Box 4805, Syracuse, NY 13221
Unitemp Inc., 3590 Kennedy Rd., So. Plainfield, NJ 07080
York Division, Borg-Warner Corp., P.O. Box 1592, York, PA 17405

ANCHORS AND CHAIN
Baldt Incorporated, P.O. Box 350, Chester, PA 19016
Neptunia, Via Giovanni da Verrazzano, 12, 16165 Genova, Italy

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
Kaiser Chemical, Div., of Kaiser Aluminum & Chemical Corp., 300 Lakeside Dr., Rm. 1128 KB, Oakland, CA 94643
The Platt Bros. & Co., Box 1030, Waterbury, CT 06721

BASKET STRAINERS
North Star Marine & Industrial Products, Inc., 84 Wall Street, Formingdale, NY 11735
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

BEARINGS—Rubber, Metallic, Non-Metallic
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Lucian Q. Moffitt, Inc., P.O. Box 1415, Akron, Ohio 44309
Thomson-Gordon Limited, 3225 Mainway, Burlington, Ontario, Canada L7M 1A6
Waukesha Bearings Corp., P.O. Box 798, Waukesha, Wisc. 53186

BLASTING—Cleaning—Equipment
Apache Equipment, Inc., 10690 Shadow Wood Dr., Suite 112, Houston, TX 77043
Aqua-Dyne Inc., 2208 Karbach St., Houston, TX 77092
Atlantic Sandblasting & Coatings, Inc., 2700 Guy Verger Blvd., Tampa, FL 33605
Butterworth Inc. (USA), 3721 Lopas 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
Complete Abrasive Blasting Systems, 18250 68th Avenue South, Kent, WA 98031
E.I. DuPont De Nemours & Co., Inc., Starblast Division, Room X39186, Wilmington, DE 19898
Genstar Stone Products Co., Executive Plaza IV, Hunt Valley, MD 21031
Rockwell International, Power Tool Division, 400 N. Lexington Ave., Pittsburgh, PA 15208
Schmidt Mfg. Inc., P.O. Box 37, Fresno, TX 77545

BOILERS
B&D Marine and Industrial Boilers, Inc., P.O. Box 5702, North Charleston, SC 29406
Combustion Engineering, Inc., Windsor, Connecticut 06095
Forney Engineering Co., P.O. Box 189, Addison, TX 75001
Foster Wheeler Boiler Corp., 110 S. Orange Ave., Livingston, NJ 07039
Howe-Baker Engineers, Inc. (Econoflex Burners), Combustion Systems Div., P.O. Box 956, Tyler, TX 75710
Way-Wolff Associates Inc., 45-10 Vernon Blvd., Long Island City, NY 11101

BROKERS
S. Danoff U.S.A. Ltd., 2050 Coral Way, Miami, FL 33145
Capt. Astad Company, Inc., P.O. Box 53434, New Orleans, La 70153
ECO Inc., 1036 Cape St. Claire Center, Annapolis, MD 21401
Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004

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
Alpha Technical Services, Inc., P.O. Box 446, Hamilton, OH 45012
MacGregor-Navire International, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016

CHOCKING SYSTEMS
Palmer Products Inc., P.O. Box 8, Worcester, PA 19490
Philadelphia Resins Corp., 20 Commerce Drive, Montgomeryville, Pa. 18936

CLAMPS
Band-It Company, P.O. Box 16307, Denver, CO 80216

CLOSURES—Marine
Cornell-Carr Co. Inc., 63 Main St., Monroe, CT 06468

CONDENSERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

CONTROL SYSTEMS—Monitoring
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Argo Marine, 140 Franklin St., New York, NY 10013
ASEA, Inc. 4 New King St., White Plains, NY 10604
Autronica Marine USA, 280 Industrial Pkwy., Northvale, NJ 07647
Avicon Corp., 7750 East Redfield Rd., Scottsdale, AZ 85260
Barringer Research, 304 Carlingview Dr., Rexdale, Ontario, Canada M9W5G2
Biospherics Inc., 4928 Wyoconda Rd., Rockville, MD 20852
Cooper Energy Services, Mount Vernon, OH 43050
Eldec Corp., P.O. Box 100, Lynwood, WA 98036
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
Fluidyne, a Div. of Electrodata Inc., P.O. Box 11366, Santa Rosa, CA 95406
Grumman Aerospace, 111 Stewart Ave., Bethpage, NY 11714
Indikon Corp., 26 New St., Cambridge, MA 02138
Leslie Co., 401 Jefferson Rd., Parsippany, NJ 07054
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
Megasystems, Inc., 1075 N.W. 58th Street, Boca Raton, FL 33431
National Control Systems, Inc., 827 Hanley Industrial Court, St. Louis, MO 63144
Nav-Vue, Inc., P.O. Box 1175, Huntsville, TX 77340
Norcontrol, 400 Oser Ave., Hauppauge, NY 11738
Norske Telektron A/S, Drammensveien 126, Oslo 2, Norway
Offshore Technology Corp., 578 Enterprise St., Escondido, CA 92025
Pandel Instruments Inc., 2100 N. Hwy. 360, Grand Prairie, TX 75050
Propulsion Systems, Inc., 21213 76 Ave., Kent, WA 98032
Seaworthy Systems Inc., 36 Main Street, Essex CT 06426
Transamerica Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062
Wesmar Marine Systems Div., 801 Dexter Ave. N., Box C19074, Seattle, WA 98109

COUPLINGS
Camlock Flange Sales Corp., 60 Inip Dr., Inwood, NY 11696
SKF Steel, 20 Tower Lane, P.O. Box 745, Avon, CT 06001

CRANES—HOISTS—DERRICKS—WHIRLEYS
American Hoist & Derrick Company (AMHoist), St. Paul, MN 55107
Appleton Marine, P.O. Box 2339, Appleton, WI 54913
ASEA Stal-Laval Inc., 525 Executive Blvd., Elmsford, NY 10523
Blohm & Voss Company, 55 Morris Avenue, Springfield, NJ 07081
Chester Hoist Division, Monogram Industries, P.O. Box 229, Lisbon, OH 44432
Grove Manufacturing Co., P.O. Box 21, Shady Grove, PA 17256
HIAB Cranes & Loaders Inc., R.D. 22 Interchange Place, York, PA 17404
Hertz Equipment Rental Corp., 7 Entin Rd., Bldg # 2, Parsippany, NJ 07054
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235
National Crane Corp., 11200 North 148 St., Waverly, NE 68462
National Supply Company, 1455 West Loop South, Houston, TX 77027
J.D. Neuhaus, Hebezeuge, D5810, Willen Heven, West Germany
Superior-Lidgerwood-Mundy Corp., 1101 John Ave., Superior, WI 54880
Washington Crane, Div. of Ederer, Inc., P.O. Box 24708, Seattle, WA 98124

DECK MACHINERY—Cargo Handling Equipment
Argo Marine, 140 Franklin St., New York, NY 10013
Marine Technical Associates, 195 Patterson Avenue, Little Falls, NJ 07424
Markey Machinery Co., Inc., 79 S. Horton St., Seattle, Wash. 98134
Murdock Machine & Engineering Company of Texas, P.O. Box 2278, Irving, TX 75061

DECKING—GRATING
International Grating, Inc., 7625 Parkhurst, Houston, TX 77028
Selby, Battersby & Company, 5220 Whiby Ave., Philadelphia, PA 19143
J.E. Steigerwald Co., Inc., 5515 Belair Rd., Baltimore, MD 21206

DIESEL ACCESSORIES—CYLINDER LINERS
B & W Marine Service, 50 Broadway, New York, NY 10004
General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, Massachusetts 02360
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231
Haynes Corporation, P.O. Box 179, Jackson, MI 49204
Van der Horst Corp. of America, 314 Penn Ave., Olean, NY 14760

DIESEL ENGINE—Spare Parts & Repair
Golten Marine Co., Inc., 160 Van Brunt St., Brooklyn, NY 11231

ELECTRICAL EQUIPMENT
Argo Marine, 140 Franklin St., New York, NY 10013
Jergens Inc., 19520 Nottingham Rd., Cleveland, OH 44110
Marine Electric RPD, Inc., 666 Pacific St., Brooklyn, NY 11217
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, Ore. 97201

EMULSIFICATION SYSTEMS
Cleanodan A/S, N. American Agents, American United Marine Corp., 5 Broadway, Route 1, Saugus, MA 01906
Fire-Brite, Hoffert Manufacturing Co., Inc., 1700 E. Church St., Jacksonville, FL 32202

EQUIPMENT—Marine
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Argo Marine, 140 Franklin St., New York, NY 10013
ASEA Stal-Laval Inc., 525 Executive Blvd., Elmsford, NY 10523
Band-It Division, Houdaille Industries, Inc., P.O. Box 16307, Denver, CO 80216
Thomas Coudon Associates, 6655 Amberton Dr., Baltimore, MD 21227
b.v. Holmatro Industrial Equipment, P.O. Box 33, 4940 aa Raamsdonksveer, Holland
Imperial Manufacturing Co., P.O. Box 4119, Bremerton, WA 98312
Juniper Industries Inc., 72-15 Metropolitan Ave., Middle Village, NY 11379
Kearfott Marine Products, 550 South Fulton Ave., Mount Vernon, N.Y. 10550
Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302
John P. Nissen, Jr. Company, Glenside, PA 19038
Stal-Laval Turbin AB, S-612 20 Finspong, Sweden

EVAPORATORS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Aqua-Chem Inc., P.O. Box 421, Milwaukee, WI 53201
MECO (Mechanical Equipment Company, Inc.), 861 Carondelet St., New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

FANS—VENTILATORS—BLOWERS
American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Argo Marine, 140 Franklin St., New York, NY 10013
Hartzell Fan, Division of Castle Hills Corp., 901 S. Downing St., P.O. Box 919, Piqua, OH 45356
Joy Manufacturing Company, 338 So. Broadway, New Philadelphia, OH 44663
Zidell Explorations, 3121 S.W. Moody St., Portland, Ore. 97201

FENDERING SYSTEMS—Dock & Vessel
Hughes Bros., Inc., 17 Battery Place, New York, N.Y. 10004
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
Mueller Steam Specialty, P.O. Box 1569, Lumberton, NC 28359
Wm. W. Nugent & Co., P.O. Box 948, Skokie, IL 60076

FINANCING—Leasing
A.G. Becker Paribus Inc., 2 First National Plaza, Chicago, IL 60670
Yegen Marine, P.O. Box 25504, Ft. Lauderdale, FL 33320

FIRE PROTECTION, DETECTION, & ALARM SYSTEMS
EEV, Inc., 7 Westchester Plaza, Elmsford, NY 10523
Gulf Publishing Company Video (Firefighting Videotape), P.O. Box 2608, Houston, TX 77001
Walter Kidde, Walter Kidde Dr., Wake Forest, NC 27586
Wormald Fire Systems, One Stanton St., Marinette, WI 54143

FUEL OIL/ADDITIVES—Analysis & Combustion Testing
Ferrous Corporation, 910-108th N.E., P.O. Box 1764, Bellevue, WA 98009
Fuji Trading (America) Ltd., 17 Battery Place, New York, NY 10004
U.S. Borax, 3075 Wilshire Blvd., Los Angeles, CA 90010

FURNITURE
Bailey Carpenter & Insulation Co., 74 Sullivan Street, Brooklyn, N.Y. 11231
Comfort-Mate, Inc., 7988 NW 56th Street, Miami, FL 33166

GALLEY EQUIPMENT
Argo Marine, 140 Franklin St., New York, NY 10013
Insinger Machine Company, 6245 State Rd., Philadelphia, PA 19135
Kiefer Corporation, W227 N546 Westmound Dr., Waukesha, WI 53186

GANGWAYS
Rampmaster Inc., 9825 Osceola Blvd., Vero Beach, FL 32960

HATCH & DECK COVERS—Chain Pipe
Camlock Flange Sales Corp., 60 Inip Dr., Inwood, NY 11696
Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207
Marine Moisture Control Co., 60 Inip Dr., Inwood, N.Y. 11696
MacGregor-Navire International, Box 8991, S-402 74 Goteborg, Sweden
MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016
Julius Mock & Sons, Inc., 20 Vesey Street, New York, NY 10007
J.E. Steigerwald Co., Inc., 5515 Belair Rd., Baltimore, MD 21206

HEAT EXCHANGERS
Alfa-Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
American Standard Inc., Heat Transfer Div., Buffalo, NY 14240
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

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
Performance Hull Cleaning Services, Inc., P.O. Box 655, New Orleans, LA 70059-0655
Petrochemical Services, Inc., 3820 Dauphine St., New Orleans, LA 70117
Seaward Marine Services, Inc., 6269 Leesburg Pike, Falls Church, VA 22044
Stork Services B.V., P.O. Box 2013, 7750 CA Hengelo, Holland

HYDRAULICS
Aeroquip Corp., 1130 Maynard Road, Jackson, MI 49202
HRS, Inc., 3334 Victor Court, Santa Clara, CA 95050
Hydronautics, 6338 Lindmar Drive, Goleta, CA 93017
Washington Chain & Supply, Inc., P.O. Box 3646, Seattle, WA 98124

INERT GAS—Generators—Systems
Camor Corp., 186 Prescott St., Worcester, MA 01605
Foster Wheeler Boiler Corp., 110 So. Orange Ave., Livingston, N.J. 07039
Maritime Protection A/S, N. American Agents, American United Marine Corp., 5 Broadway, Rte. 1, Saugus, MA 01906
Salwico Inc., 5 Marine View Plaza, Hoboken, NJ 07030

INSULATION—Cloth, Fiberglass
Bailey Carpenter & Insulation Co., Inc., 74 Sullivan St., Brooklyn, N.Y. 11231
Superior Energies, Inc., P.O. Drawer 386, Groves, TX 77619
Waco Inc., P.O. Box 24347, Richmond, VA 23224

INSURANCE
Adams & Porter, 1819 St. James Place, Houston, Texas 77027
Adams & Porter, 1 World Trade Center, Suite 8433, New York, N.Y. 10048
Assurance Foreningen Skuld, P.O. Box 1376 Vika, Stortingagaten 18, N-OSLO 1, Norway
R.A. Fulton & Company Insurance Services, 100 California St., San Francisco, CA 94111
Midland Insurance Co., 160 Water St., New York, N.Y. 10038
United States P&I Agency, Inc., 80 Maiden Lane, New York, NY 10038

JOINER—Watertight Doors—Paneling
Bailey Distributors, Inc., 74 Sullivan St., Brooklyn, NY 11231
Isolamin Panels, c/o Consafe, Inc., P.O. Box 40339, Houston, TX 77040
Masonite Commercial Division, Dover, OH 44622
Megadoor Inc., 441 Lexington Ave., Suite 903, New York, NY 10017
Simpson Timber Company, Third & Franklin, Shelton, WA 98584
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
Browning Marine Inc., (Aqua Signal) 33W 480 Fabyan Parkway, Ste 105, West Chicago, IL 60185
Keuffel & Esser/Kratos, 20 Whippany Rd., Morristown, NJ 07960
Midland-Ross Corp., Russellstoll Division, 530 W. Mt. Pleasant Ave., Livingston, NJ 07039
Oceanic Electrical Mfg. Co., 157 Perry St., New York, NY 10014
Oreck Corp., 100 Plantation Rd., New Orleans, LA 70123
Perko Inc., P.O. Box 6400D, Miami, Florida 33164
Phoenix Products Company, Inc., 4769 North 27th Street, Milwaukee, WI 53209
Port Electric Supply Corp., 157 Perry St., New York, NY 10014
SSAC Inc., P.O. Box 395, Liverpool, NY 13088

LINE BLINDS
Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474

MACHINE TOOLS
Republic-Lagun Machine Tool Co., 1000 E. Carson St., Carson, CA 90749

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING
AMT Inc., 2400 N.W. 39th Ave., Miami, FL 33142
Amermarine USA Inc., P.O. Box 9205, Baltimore, MD 21222
American General/Levin Corp., 445 Littlefield Ave., So. San Francisco, CA 94080
Essex Machine Works, Essex, CT 06426
Golten Marine Co., Inc., 60 Van Brunt St., Brooklyn, NY 11231
Jered Brown Brothers Inc., 1300 Coolidge, P.O. Box 2006, Troy, MI 48007-2006
Scotchman Industries, Inc., P.O. Box 850, Philip, SD 57567-0850

METALS
Bayou Steel Corp., P.O. Box 5000, Laplace, LA 70068
Inland Steel Company, 30 West Monroe Street, Chicago, IL 60603
International Grating, Inc., 7625 Parkhurst, Houston, TX 77028

MOORING SYSTEMS
Murdock Machine & Engineering Company of Texas, P.O. Box 2278, Irving, TX 75061
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110

NAME PLATES—BRONZE—ALUMINUM
Duramax Metals, Inc., 2401 Wesley Street, Portsmouth, VA 23707

NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS
Adams & Chute, Huntingtown Road, Newtown, CT 06470
Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Highway (Suite 1300), Arlington, VA 22202
Aero Nav 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
Bretagne ACB Corp., 344 Camp St., Suite 1000, New Orleans, LA 70130
Carl G. Brimmekamp & Co., Inc., 102 Hamilton Ave., Stamford, CT 06902
C.A.C.I., Inc., 1815 No. Fort Myer Dr., Arlington, VA 22209
C.D.I. Marine Co., Regency East, Ste 222, 9951 Atlantic Blvd., Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
CADCOM, 107 Ridgely Ave., Annapolis, MD 21401
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, Mass. 02052
John P. Colletti & Associates, P.O. Box 13378, Pittsburgh, PA 15243
Crandall Dry Dock Engrs., Inc., 21 Pottery Lane, Dedham, Mass. 02026
Crane Consultants Inc., 15301 1st Ave., So. Seattle, Washington 98148
C.R. Cushing & Co., Inc., One World Trade Center, New York, N.Y. 10048
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
Parker C. Emerson & Associates, 17935 Cardinal Drive, Lake Oswego, Oregon 97034
Encon Management & Engineering Consultant Services, P.O. Box 7760, Beaumont, TX 77706
Fleetweather Ocean Services, Inc., Rd. # 2, Box 260, Hopewell Junction, NY 12533
Christopher J. Foster, Inc., 16 Sintsink Drive East, Port Washington, N.Y. 11050
Friede and Goldman Ltd., 935 Gravier St., New Orleans, LA 70112
GEOD Corporation, 73 Oak Ridge Road, NJ 07438
Gionnotti & Associates, Inc., 703 Giddings Ave., Suite U-3, Annapolis, MD 21401
Gibbs & Cox, Inc., 119 West 31st Street, New York, NY 10001
John W. Gilbert Associates, Inc., 66 Long Wharf, Boston, MA 02110

BUYERS DIRECTORY

(continued)

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
J.J. Henry Co., Inc., Two World Trade Center—Suite 9528, New York, N.Y. 10048
Hi-Test Laboratories, Inc., P.O. Box 226, Buckingham C.H., VA 23921
Hoffman Maritime Consultants Inc., P.O. Box 186, Glen Head, NY 11545
Intramorine, Inc., P.O. Box 53043, Jacksonville, FL 32201
R.D. Jacobs & Associates, 11405 Main St., Roscoe, IL 61073
Capt. Ernest James, 2849 Beavercrest Dr., Lorain, OH 44053
Jantzen Engineering Co., 6655-H Amberton Drive, Baltimore, Md. 21227
James S. Krogen & Co., Inc., 3333 Rice St., Miami, Fla. 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, N.Y. 10048
MacLear & Harris, Inc., 28 West 44 Street, New York, N.Y. 10036
Fendall Marbury, 1933 Lincoln Drive, Annapolis, MD 21401
Marine Consultants & Designers, Inc., 308 Investment Insurance Bldg., Corner E. 6th St. & Rockwell Ave., Cleveland, Ohio 44114
Marine Design Inc., 401 Broad Hollow Road, Rte. 110, Melville, N.Y. 11746
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
Metritape Inc., P.O. Box 2366, Littleton, MA 01460
R. Carter Morrell, 715 S. Cherokee, Bartlesville, OK 74003
NKF Engineering Assoc., Inc., 8150 Leesburg Pike, Vienna, VA 22202
Nelson & Associates, Inc., 1405 N.W. 167th Street, 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 International 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, Florida 33156
S.L. Petchul, Inc., 1380 S.W. 57th Avenue, Fort Lauderdale, FL 33317
Precision Systems Engineering, 824B Eastgate Dr., Mt. Laurel, NJ 08054
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, Florida 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 Engine Systems, 36 Main Street, Essex, CT 06426
Seaworthy Engine Systems, 17 Battery Place, New York, NY 10004
George G. Sharp, Inc., 100 Church St., New York, N.Y. 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
Timsco, 622 Azalea Road, Mobile, AL 36609
Tracor Hydronautics, Inc., 7210 Pindell School Rd., Laurel, MD 20707
Uhlig & Associates, Inc., 8295 SW 188th St., Miami, FL 33157
Vevey Engineering Works Ltd., CH–1800 Vevey, Switzerland, U.S. Rep: Carl G. Brimmekamp & Co., Inc., 102 Hamilton Ave., Stamford, CT 06902
Thomas B. Wilson, Associates, 1258 North Avalon Blvd., Wilmington, CA 90744
Yacht Design Institute, 9 Main St., Blue Hill, ME 04614

NAVIGATION & COMMUNICATIONS EQUIPMENT

Alden Electronics, 1145 Washington St., Westborough, MA 01581
American Hydromath Co., Buckwheat Bridge Rd., Germantown, N.Y. 12526
Anschutz & Co. GmbH, Postfach 6040, D-2300 Kiel 14, West Germany
Atkinson Dynamics, Section 6, 10 West Orange Ave., South San Francisco, CA 94080
CMC Communications Inc., 5479 Jetport Industrial Blvd., Tampa, FL 33614
COMSAT World Systems, 950 L'Enfant Plaza, S.W., Suite 6151 Washington, D.C. 20024
Cybernet International, Inc., 7 Powder Horn Dr., Warren, NJ 07060
A/S Elektrisk Bureau, P.O. Box 98, N-1360 Nesbru, Norway
Electro-Nav Inc., 840 Bond Street, Elizabeth, NJ 07201
EPSCO Marine, 550 Wholesalers Parkway, Harahan, LA 70123
Fleet Marine, 1820 N.E. 146th Street, North Miami, FL 33181
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080
Harris Communications (RF Communications), 1680 University Avenue, Rochester, NY 14610
Henschel Corp., 14 Cedar St., Amesbury, MA 01913
Hose McCann Telephone Company, Inc., 9 Smith Street, Englewood, NJ 07631
Japan Radio Co., Ltd., Akasaka Twin Tower (Main), 17-22 Akasaka 2-chome, Minato-ku, Tokyo 107, Japan
King Radio Corporation, 400 North Rodgers Rd., Olathe, KS 66062
Kongsberg North America Inc., 400 Oser Ave., Hauppauge, NY 11738
Kongsberg Vapenfabrikk, Norcontrol Division, P.O. Box 145, Horten 3191, Norway
Krupp Atlas-Elektronik, 1453 Pinewood St., Rahway, NJ 07065
Lorain Electronics Corp., 2307 Leavitt Rd., Lorain, OH 44052
Magnavox Navigation Systems, 2829 Maricopa Street, Torrance, CA 90503
Magnum Distributors Inc., 1000 S. Dixie Hwy. #3, Pompano Beach, FL 33060
Nav-Com, Inc., 9 Brandywine Drive, Deer Park, NY 11729
Navidyne Corp., 11824 Fishing Point Drive, Newport News, VA 23606
Perko Inc. (Lights), P.O. Box 6400D, Miami, FL 33164
Rocal-Decca Marine, Inc., 4200 23rd Avenue West, Seattle, WA 98199
Radar Devices, Inc., 2955 Merced Street, San Leandro, CA 94577
Radio-Holland USA, Inc., 6033 South Loop East, Houston, TX 77033
Raytheon Marine Co., 676 Island Pond Road, Manchester, N.H. 03103
Raytheon Ocean Systems Company, Westminster Park, Risho Avenue, East Providence, RI 02914
Raytheon Service Co., 103 Roesler Rd., Glen Burnie, MD 21061
Rivertronics, P.O. Box 247, Godfrey, IL 62035
Robertson Auto Pilot, 400 Oser Ave., Hauppauge, NY 11738
Selesmar S.p.A., Casella Postale 9, 50020 Montagnana Val Di Pesa, Firenze, Italy
Servo Corporation of America, 111 New South Road, Hicksville, NY 11802
Simrad, Inc., 2215 NW Market St., Seattle, WA 98107
Sperry Corporation, Great Neck, NY 11020
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
Texas Instruments, Inc., P.O. Box 405, 3438, Lewisville, TX 75067

OILS—Marine—Additives

Gulf Oil Company—U.S. (Domestic Oils), 909 Fannin Street, Houston, TX 77001
Gulf Oil, New York District Soles 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
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
Texaco, Inc. (International Marine), 135 East 42nd St., N.Y., N.Y. 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
Hyde Products, Inc. 810 Sharon Dr., Westloke, OH 44148
Microphor, Inc., P.O. Box 490, Willits, CA 95490
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
National Fluid Separators, Inc., 1239 Hanley Industrial Court, St. Louis, MO 63144
PACE Maine Systems, Div. of St. Louis Ship, 611 E. Marceau St., St. Louis, MO 63111
Phoenix Oil Refiner Co., Inc., 330 Hill Ave., Nashville, TN 37210

PAINTS—COATINGS—CORROSION CONTROL

American Abrasive Metals, 460 Coit Street, Irvington, NJ 07111
Ameron, 1967 Burgess Circle, Placentia, CA 92670
Argo Marine, 140 Franklin St., New York, NY 10013
Bareco, 6910 East 14th St., Tulsa, OK 74112
CLEMCO, P.O. Box 7680, San Francisco, CA 94120
"CONSOL" manufactured by Cantact Paint & Chemical Co. Inc., 200 S Franklintown Rd., Baltimore, MD 21223
Devoe Marine Coatings Co., P.O. Box 7600, Louisville, KY 40207
E.I. Dupont De Nemours & Co., Inc., Nemours Bldg. Rm. N-2504-2, Wilmington, DE 19898
Esgard, Box 2698, Lafayette, LA 70502
Eureka Chemical Company, 234 Lawrence Avenue, So. San Francisco, CA 94080
Grow Group, Inc., 200 Park Ave., New York, NY 10017
Hempel Marine Paints, Inc., Foot of Currie Ave., Wallington, NJ 07057, 2425 Fountainview, Suite 340, Houston, TX 77057, P.O. Box 10265, New Orleans, LA 70181
International Paint Company, Inc., 2270 Morris Avenue, Union, NJ 07083
Jaegle Paint Co., Inc., 1912 Darby Rd., Havertown, PA 19083
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
Edison, N.J. 08817
Palmer Products Inc., P.O. Box 8, Worcester, PA 19490
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203
Salwico Glassflake, Inc., 5 Marine View Plaza, Hoboken, NJ 07030
Seaguard, 4030 Seaguard Ave., Portsmouth, VA 23705
Selby, Battersby & Company, 5220 Whiby Avenue, Philadelphia, PA 19143
SermeTel, Inc., 4401 SermeTel Dr., Moss Point, MS 39563

PETROLEUM SUPPLIES

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

PIER REPAIRS

Acquatic Marine Systems, Inc., P.O. Box 326, Williamsville, NY 14221

PIPE-HOSE—Cargo Transfer, Clamps, Couplings, Coatings

Cojon Company, 9760 Shepard Rd., Macedonia, OH 44056
Camlock Flange Sales Corp., 60 Inip Dr., Inwood, NY 11696
Crawford Fitting Company, 29500 Solon Rd., Solon, OH 44139
Hydro-Craft, Inc., 1821 Rochester Industrial Dr., Rochester, MI 48063
Knights Piping Inc., 5309 Industrial Rd., Pascagoula, MS 39567
Metropolitan Plumbing Supply Corp., 5000 Second St., Long Island City, NY 11101
Penco Division/Hudson Engineering Co., P.O. Box 68, Boyonne, NJ 07002
Selkirk Metalbestos, Box 19000, Greensboro, NC 27419
Stouff Corporation, 21-31 Industrial Park, Waldwick, NJ 07463

PLASTICS—Marine Applications

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

PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines

American Lohmann Corp., 1415 Chestnut Ave., Hillside, NJ 07205
Aquamaster, 4125 9th Ave., 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 1–10 Service Rd., Kenner, LA 70062
Bird Johnson Company, 110 Norfolk St., Walpole, Mass. 02081
Bombardier, 1051 Dickson, Montreal, Quebec, Canada H1N 2H7
Burmeister & Wain Alpha Diesel AS, DK-1400 Copenhagen K, Denmark
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 Lowton Avenue, Beloit, WI 53511
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
Combustion Engineering, Inc., Windsor, Connecticut 06095
Daihatsu Diesel (USA) Inc., 1211 Ave. of the Americas, New York, NY 10036
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340
Diesel Marine International, Ltd., c/o NORSHIPCO, P.O. Box 2100, Norfolk, VA 23501
Elliott Company, 1809 Sheridan Ave., Springfield, OH 45505
General Electric Co., Diesel Power Products, 2901 E. Lake Rd., Erie, PA 16531
General Motors, Electro-Motive Division, LaGrange, IL 60525
George Engine Company, Inc., Lafayette, LA
Golten Marine Co., Inc., 160 Von Brunt St., Brooklyn, NY 11231
Harbormaster, 36 Hancock St., Quincy, MA 02171
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
Krupp Mak Diesels, Inc., 4329-33 Di Paolo Center, Glenview, IL 60025
Lips Propellers, 3617 Koppens Way, Chesapeake, VA 23323
Lufkin Industries, Inc., P.O. Box 749, Lufkin, TX 75901
M.A.N.-B&W Diesel, 2, Osterve, DK-4960 Holeby, Denmark
MTU of North America, One E. Putnam Ave., Greenwich, CT 06830; 10450 Corporate Dr., Suaarland, 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
Mopeco Products, Inc., 20 Vesey St., New York, NY 10007
Maritime Industries Ltd., 6307 Laurel St. Burnoby, B.C., Canada V5B3B3
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
National Propeller Exchange, P.O. Box 1444, Grafton, VA 23692
Omnithruster Inc., 9515 Sorensen Ave., Santo Fe Springs, CA 90670
Penske GM Power, Inc., 600 Porsippany Road, Parsippony, NJ 07054
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
Karl Senner, Inc., P.O. Box 10055, New Orleans, LA 70181
Skinner Engine Company, P.O. Box 1149, Erie, PA 16512
Sulzer Brothers, Dept. Diesel Engines, CH-8401 Winterthur, Switzerland
Transamerica DeLaval Inc., Engine & Compressor Div., 550 85th Ave., Oakland, CA 94621
Transamerica Delaval, Inc., Turbine & Compressor Div., P.O. Box 8788, Trenton, N.J. 08650
Turbine Specialties, Inc., P.O. Box 207, West State Street Road, Salino, KS 67401
Turbine Specialties/Gulf Coast, Inc., 1900 Industrial Blvd., Harvey, LA 70058
Voith Schneider America, 159 Great Neck Rd., .Ste 200, Great Neck, NY 11021
Volva 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
Welco Industries, Inc., 9027 Shell Rd., Cincinnati, OH 45236
ZF of North America, Inc., 3225 Commercial Avenue, Northbrook, IL 60062
ZF of North America, Inc. (Motive Power Corporation, P.O. Box 365, Mineola, NY 11501)

PUMPS—Repairs—Drives

Argo Marine, 140 Franklin St., New York, NY 10013
Jim's Pump Repair, 48-55 36th St., Long Island City, NY 11101
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238
Penco Division/Hudson Engineering Co., P.O. Box 68, Boyonne, NJ 07002
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, N.Y. 11231
Port Refrigeration Div., 157 Perry St., New York, NY 10014

ROLLING SYSTEMS

Hilman, Inc., 2604 Atlantic Ave., Wall (Belmor), NJ 07719

ROPE—Manila—Nylon—Hawsers—Fibers

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
Norton Chemplast, 309-150 Dey Rd., Wayne, NJ 07470
Samson Ocean Systems, Inc., 99 High Street, Boston, Mass. 02110
Tubbs Cordage Company, P.O. Box 709, Orange, CA 92666
Wall Industries, Inc., P.O. Box 560, Elkin, NC 28621

RUDDER ANGLE INDICATORS—STEERING

Hy-Drive America Corp., 3629 Vernon Blvd., Long Island City, NY 11106
Marine Drive Systems, 519 Roriton Center, Edison, NJ 08817
Robertson, 135 Fort Lee Rd., Leonia, NJ 07605

SAFETY EQUIPMENT

Wormald Fire Systems, One Stanton St., Marinette, WI 54143

SANITATION DEVICES—Pollution Control

Argo Marine, 140 Franklin St., New York, NY 10013
Davit Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
Ulstein Trading Ltd. A/S, N–6065, Ulsteinvik, Norway
Marine Moisture Control Co., Inc., 60 Inip Dr., Inwood, L.I., N.Y. 11696
National Sanitation Foundation, P.O. Box 1468, Ann Arbor, MI 48105

SCAFFOLDING EQUIPMENT—Work Platforms

McCausey Lumber Co., 7751 Lyndon, Detroit, MI 48238
Patent Scaffolding Co., One Bridge Plaza, Fort Lee, NJ 07024
Trus-Joist Corp., P.O. Box 60 Boise, ID 83704

SHAFT SEALS, REVOLUTION INDICATOR EQUIPMENT

Bird-Johnson Co., 100 Norfolk St., Walpole, MA 02081
Crane Packing Company, 435 Regina Dr., Clarksburg, MD 20734
EG&G Sealol, Engineered Products Div., Marine Products Group, Warwick, RI 02888
Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002

SHIPBREAKING—Salvage

The Boston Metals Co., 313 E. Baltimore St., Baltimore, Md. 21202
Fred Devine Diving & Salvage, Inc., 6211 N. Ensign, Swan Island, Portland, OR 97217
Zidell Explorations, Inc., 3121 S.W. Moody St., Portland, Ore. 97201

SHIPBUILDING EQUIPMENT

Pearlson Engineering Co., P.O. Box 8, Kendall Branch, Miami, FL 33156
Total Transportation System Inc., 813 Forrest 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, Ohio 45042
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
Tiline, P.O. Box 729, Albany OR 97321
Welded Beam Company, P.O. Box 280, Perry OH 44081

SHIPBUILDING—Repairs, Maintenance, Drydocking

Alabama Maritime Corp., P.O. Box 3026, Mobile, AL 36652
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 10006
Asmar Shipyards Co., Astilleros y Maestranzs de la Armada, Prat 856, Piso 14, Casilla 150-V, Valpariso, Chile, S.A.
Astilleros Balboa, S.A., c/o Jackson Marine Corp., 17 Battery Place, New York, NY 10004
Atlantic Dry Dock, P.O. Box 276, Ft. George Island, Jacksonville, FL 32226
Atlantic Marine Inc., P.O. Box 138, Ft. George Island, Jacksonville, FL 32226
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Bath Iron Works Corp., 700 Washington St., Bath, ME 04530
Bay Shipbuilding Corp., 605 North 3rd Ave., Sturgeon Bay, WI 54235
Bender Shipbuilding & Repair Co., Inc., P.O. Box 42, Mobile, AL 36601
Bethlehem Steel Corp., Martin Tower, Bethlehem, PA 18018
Blohm & Voss Company, 55 Morris Avenue, Springfield, NJ 07081
Burmeister & Wain Skibsvaerft A/S, P.O. Box 2122, Refsholeoen-1015 Copenhagen K-Denmark
Burrard Yarrows Corporation, P.O. Box 86099, North Vancouver, B.C., Canada
Caneco Shipyard, Rua Carlos Seidl, 714, Caju, 20.931, Rio de Janeiro, RJ, Brazil
Cantieri Navali Riuniti, Via Cipro, 11, 16100 Genova, Italy
Carrinaton Slipways Pty. Ltd., Old Punt Rd., Tomago NSW Australia 2322
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Curacao Drydock Company Inc., 26 Broadway, Suite 741, New York, NY 10004
Daewoo International (America) Corp., 437 Madison Ave., New York, NY 10022
Daewoo Shipbuilding & Heavy Machinery Ltd., Ayangri, Chongsung-PO, Koje-Kun, Kyungnom, Korea
Davie Shipbuilding Ltd., P.O. Box 130, Levis, Quebec, Canada G6V6N7
Dorbyl Ltd., Military Road, 1 Industrial Sites, West Bank, 5201 East London, Republic of South Africa
Dravo Marine Equipment Company, Neville Island, Pittsburgh, PA 15225
Eastern Marine, Inc., P.O. Box 1009, Panamo City, FL 32401
Equitable Shipyards, Inc., P.O. Box 8001, New Orleans, LA 70182
FMC Corp., Marine & Rail Equipment Div., 4700 N.W. Front Ave., Portland, Oregon 97208
Far East Levingston Shipbuilding Ltd., 31 Shipyard Rd., Jurong Town, Singapore 2262
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
Hoboken Shipyards, Inc., 1301 Hudson St., Hoboken, NJ 07030
Hong Kong United Dockyards Ltd., P.O. Box 534, Kowloon Central Post Office, Kowloon, Hong Kong
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, Korea
I.N.M.A. S.p.A., 19100 La Spezia, v. le S. Bartolomeo 362, Italy
Jakobson Shipyard Inc., P.O. Box 329, Oyster Bay, NY 11771
Jeffboat, Inc., Jeffersonville, Ind. 47130
Keppel Shipyard Limited, 325 Telok Blongah 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, Hyvinkoa, Finland
Leevac Corporation, P.O. Box 2607, Morgan City, LA 70381
Lockheed Shipbuilding and Construction Co., 2929 16th Avenue, S.W., Seattle, Wash. 98134

Chugoku Introduces New Antifouling Hull Coatings — Literature Available

Chugoku Marine Paints, Ltd. of Japan recently introduced a new family of self-polishing, antifouling hull coatings. These new products are based on the formulation technology of the company's AF-SEAFLO Z-100 self-polishing antifouling paint that was developed five years ago and is now in service on more than 500 ships worldwide.

In AF-SEAFLO Z-100 HS, volume of solids has been increased tremendously and dry film thickness up to 50 percent, showing the same antifouling performance and self-polishing action as the original formulation. Up to 150 microns per coat can be applied, and coverage is decreased by 10 percent. A two-coat system is said to offer up to 36 months protection.

AF-SEAFLO Z-100 LE and AF-SEAFLO Z-100 LE HS have a low eroding/polishing rate that insures excellent antifouling activity for a longer period of operation. They can be applied without extensive hull blasting, in some cases over conventional existing paints.

For further information and free literature on these new coatings,

Circle 18 on Reader Service Card

Lockheed Gets $9½-Million Navy Award To Provide LSD Lead Yard Services

Lockheed Shipbuilding and Construction Company, Seattle, Wash., has been awarded a $9,465,815 cost-plus-fixed-fee contract for providing LSD-41 Class dock landing ship lead yard services to the follow-on shipbuilder. The Naval Sea Systems Command is the contracting activity.

New Literature Describes Frick Screw Compressor

A literature-filled folder that provides information on the energy-saving features of the Frick Company's RWB II screw compressor is now available. Materials include: a four-page color brochure covering the unit's design, operating and first-cost efficiencies, and microprocessor control; a two-color flier depicting potential energy savings available with the new compressor; and an energy analysis questionnaire that will permit Frick to provide a free, computer-generated analysis of the respondent's refrigeration system.

For a free copy of this Frick literature,

Circle 17 on Reader Service Card

SHIPPING—PACKING
Pilotage Consultants, Inc., P.O. Box 2046, New Hyde Park, NY 11040

SILENCERS
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

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

STUFFING BOXES
Johnson Rubber Co., Duramax Marine Div., 16025 Johnson St., Middlefield, OH 44062
Smith-Meeker Engineering Co., 157 Chambers Street, New York, NY 10007

SURVEYORS AND CONSULTANTS
Francis B. Crocco, Inc., P.O. Box 1411, San Juan, Puerto Rico 00903
Frank Jeffrey & Assoc., 5201 Westbonk Exp., Suite 206, Morrero, LA 70073
M.A. Stream Associates, Inc., 400 Second Ave. W., Seattle, WA 98119

TANK 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
Penco Division/Hudson Engineering Co., P.O. Box 68, Bayonne, NJ 07002
Petrochemical Services, Inc., 3820 Dauphine St., New Orleans, LA 70117

TANK LEVELING INDICATORS
Kockumation AB, Box 1044, S-212 10 Malmo, Sweden
Marine Moisture Control Co., 60 Inip Dr., Inwood, NY 11696
Metritape, Inc., P.O. Box 2366, Littleton, MA 01460
Norcontrol, 135 Fort Lee Rd., Leonia, NJ 07605
Salwico Inc., 5 Marine View Plaza, Hoboken, NJ 07030
Transamerico Delaval, Inc., Gems Sensors Division, Cowles Road, Plainville, CT 06062

TOWING—Barges, Vessel Chartering, Lighterage, Salvage, etc.
Bay-Houston Towing Co., 805 World Trade Bldg., Houston, Texas 77002
Bulkfleet Marine Corporation, 1800 West Loop So., Houston TX 77027
Curtis Bay Towing Co., Mercantile Bldg., Baltimore, Md 21202
Henry Gillen's Sons Lighterage, 21 West Main St., Oyster Bay, N.Y. 11771
James Hughes, Inc., 17 Battery Pl., New York, N.Y. 10004
International Transport Contractors Holland B.V., 5 Kenaupark, P.O. Box 21, Haarlem, Holland
McAllister Bros., Inc., 17 Battery Pl., New York, N.Y. 10004
McDonough Marine Service, P.O. Box 26206, New Orleans, La.
Midland Affiliated Co., 580 Walnut St., Cincinnati, OH 45201
Moran Towing & Transportation Co., Inc., One World Trade Center, Suite 5335, New York, N.Y. 10048
National Marine Service, Transport Div., 1750 Brentwood Blvd., St. Louis, MO 63144
Suderman & Young Co., Inc., 918 World Trade Bldg., Houston, Texas 77002
Turecamo Coastal & Harbor Towing Corp., One Edgewater St., Clifton, Staten Island, N.Y. 10305

VALVES AND FITTINGS
Camlock Flange Sales Corp., 60 Inip Dr., Inwood, NY 11696
Clow Corporation, 1375 Magnolia Ave., Corona, CA 91720
Dover Corporation, Norris Division, P.O. Box 1739, Tulsa, OK 74101
Elliott Manufacturing Co., Inc. (Remote Valve Operating Equipment), P.O. Box 773, Binghamton, NY 13902
Hayward Marine Products, 900 Fairmount Avenue, Elizabeth, NJ 07207
Jamesbury Corp., 640 Lincoln Street, Worcester, MA 01605
Marine Moisture Control Co., 60 Inip Dr., Inwood, N.Y. 11696
Metropolitan Plumbing Supply Corp., 50-09 Second Street, Long Island City, NY 11101
Newmans Inc., 9 Joanna Court, East Brunswick, NJ 08816
Pittsburgh Brass Manufacturing, Sandy Hill Rd., R.D. 6 Box 387-A, Irwin, PA 15642
Stacey/Fetterolf Corp., P.O. Box 103, Skippack, PA 19474
Stockham Valves & Fittings, Box 10326, Birmingham, AL 35202
Tate Temco, Inc., 1941 Lansdowne Road, Baltimore, MD 21227
Union Flonetics, P.O. Box 459, Clinton, PA 15026
Robert H. Wager Co., Inc., Passaic Avenue, Chatham, N.J. 07928
Waukesha Bearings Corp., 405 Commerce St., P.O. Box 798, Waukesha, WI 53186
Westron Corporation, Valve Components Group, 4025 Rememberance Rd, N.W., Grand Rapids, MI 49504
William E. Williams Valve Corporation, 38-52 Review Avenue, Long Island City, NY 11101
Winel, Inc., 34655 Mills Road, North Ridgeville, OH 44039
Zidell Explorations, Inc., (Valve Division), 3121 S.W. Moody Avenue, Portland, OR 97201

VIBRATION ANALYSIS
DLI Engineering Corp., 253 Winslow Way West, Bainbridge Island, WA 98110

WATER PURIFIERS
Alfa Laval, Inc., Dept. MR-2, 2115 Linwood Ave., Fort Lee, NJ 07024
Aqua-Chem, Inc. P.O. Box 421, Milwaukee, WI 53201
Bull & Roberts, Inc., 785 Central Ave., Murray Hill, NJ 07974
Drew Chemical Corporation, One Drew Chemical Plaza, Boonton, NJ 07005
Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559
Marine Moisture Control, 60 Inip Dr., Inwood, NY 11696
MECO (Mechanical Equipment Company, Inc.), 861 Carondelet St., New Orleans, LA 70130
Riley-Beaird, P.O. Box 31115, Shreveport, LA 71130

WELDING
CRC Automatic Welding, P.O. Box 3227, Houston, TX 77253-3227
Metallizing Co. of America, Inc., 321 So. Hamilton, Sullivan, IL 61951
Miller Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912
Oerlikon Welding Industries, Inc., P.O. Box 40964, Houston, TX 77240

WINCHES AND FAIRLEADS
Braden Winch Co., 800 East Dallas, Broken Arrow, OK 74012
CONMACO, Inc., 820 Kansas Ave., P.O. Box 5097, Kansas City, KS 66119
Fritz Culver, Inc., P.O. Box 569, Covington, LA 70434
Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134
McElroy Machine & Mfg. Co., Inc., P.O. Box 4454, W. Biloxi, MS 39531
Reel-O-Matic Systems, Inc., 418 Hellam Street, Wrightsville, PA 17368
Smith Berger Marine Inc., 516 So. Chicago St., Seattle, WA 98108
Stanspec Corp., 13600 Deise Ave., Cleveland OH 44110
Superior-Lidgerwood-Mundy Corp., 1101 John Avenue, Superior, WI 54880

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

WIRE AND CABLE
Anaconda Ericsson Inc., Continental Wire and Cable, P.O. Box 1863, York, PA 17405
Anixter Bros., Inc., 4711 Golf Road, One Concourse Plaza, Skokie, Illinois 60076
Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008
Delco Wire & Cable, Inc., 257 Rittenhouse Circle, Keystone Industrial Park, Bristol, PA 19007
Seacoast Electric Supply Corp., 225 Passaic St., Passaic, NJ 07055
Seacoast Electric Supply Corp., 1505 Oliver St., Houston, TX 77007

WIRE ROPE—Slings
AISCO, 60 Grant Ave., Carteret, NJ 07008
Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008
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

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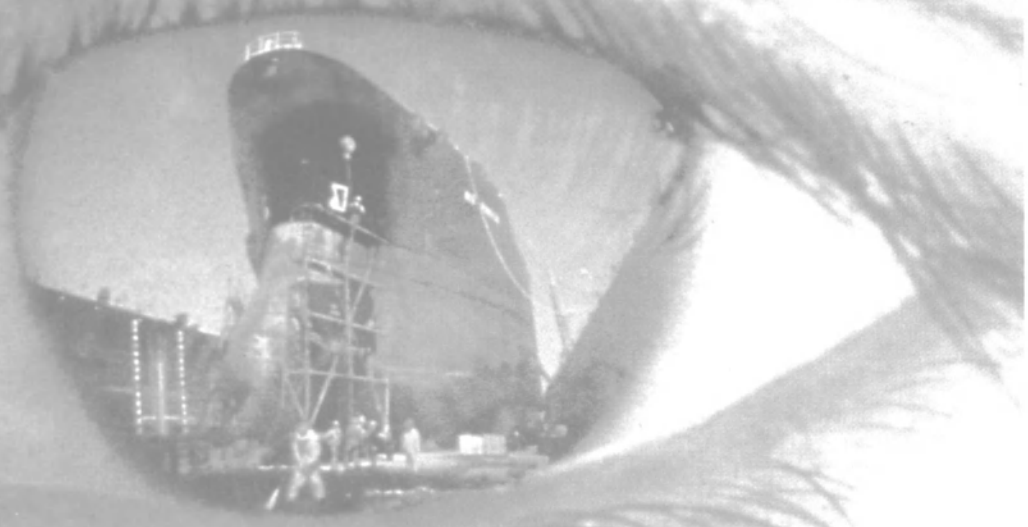

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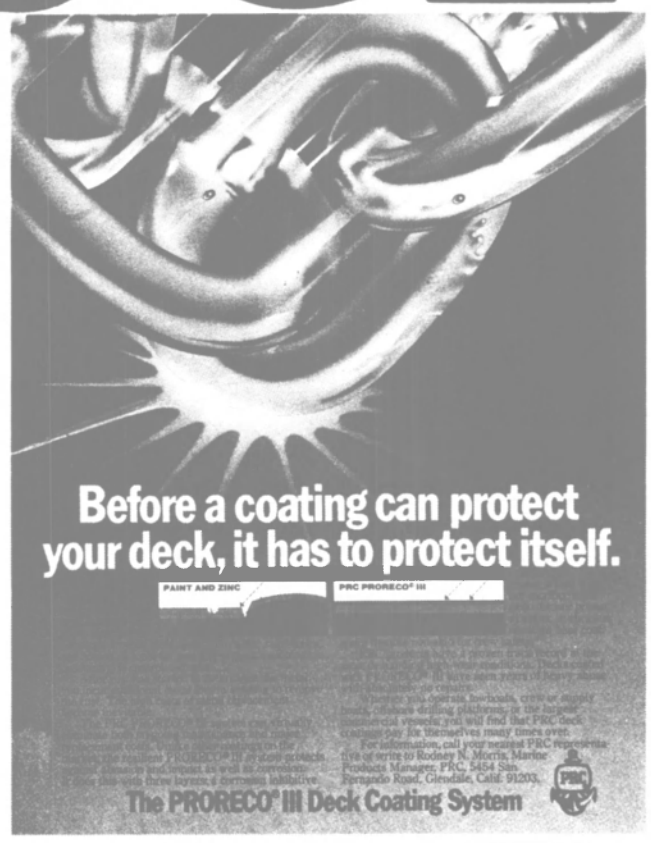

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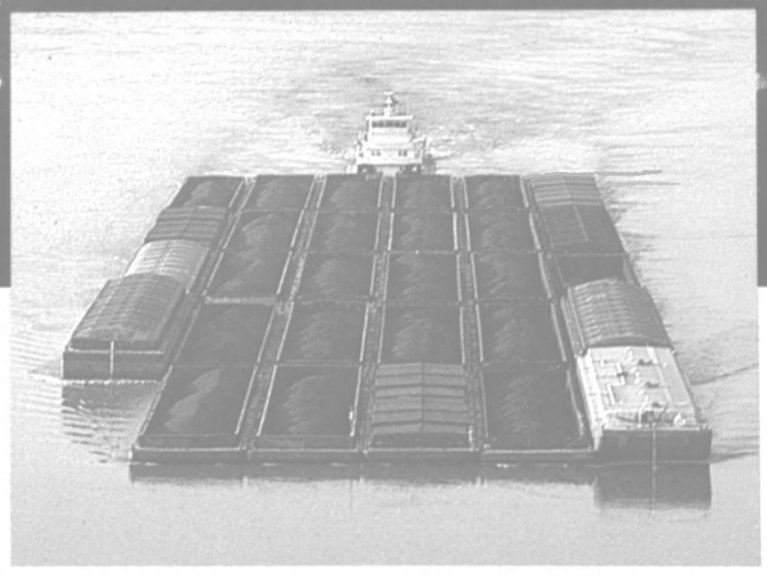

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