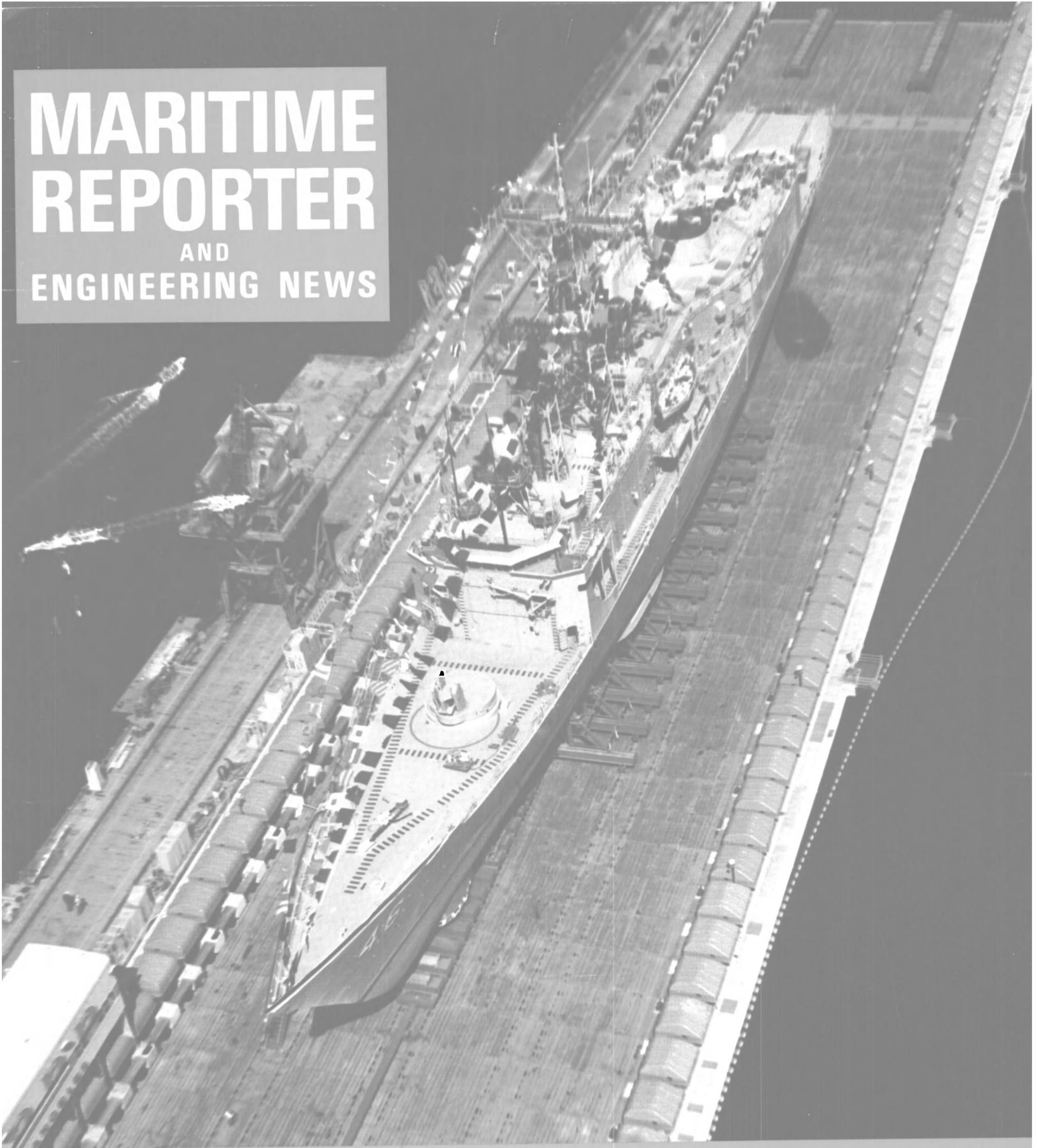


MARITIME REPORTER

AND
ENGINEERING NEWS



The New Syncrolift At Todd's San Pedro Yard

**New Syncrolift Inaugurated
At Todd's San Pedro Yard**
(SEE PAGE 4)

POSIDONIA '84
(SEE PAGE 4)

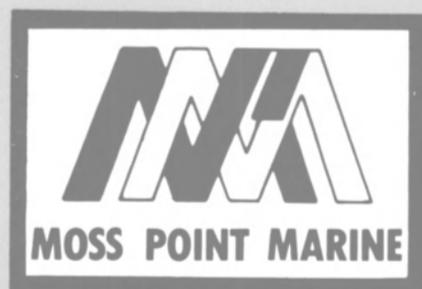
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Painting courtesy Norman Kjeldsen, Esq.

Bear a hand for the Wavertree.

In 1895, the Wavertree arrived at New York under sail. This painting by Oswald Brett depicts the historic event. While we cannot say for certain, the Wavertree may have been met by one of the McAllister tugs which have served New York Harbor since 1864. Legends are made of such moments. The Wavertree and her sister ships, in their day, were our responsibility.

We at McAllister take pride in being part of the history and lore of New York Harbor. The Wavertree is now at the South Street Seaport Museum and we support her restoration in order to keep maritime and nautical traditions alive for future generations. Bear a hand. Send your donation to: Ship Trust, c/o National Maritime Historical Society, 15 State Street, New York, N.Y. 10004.

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Corrosion is a tough surface problem. And in this brochure, we've only lightly touched the surface of how effective Sermatech advanced technology coating systems are at providing corrosion protection in marine environments. For more information about SermeTel 825, SermeTel 725, or any of our other related coatings, get in touch with us at one of the offices listed here.



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ON THE COVER

Photo—Joseph Ernest, Todd Pacific Shipyards,
Los Angeles Division.

**New Syncrolift
Inaugurated At
Todd San Pedro**
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**Posidonia
— A Preview —**
PAGE 16

**Marine Coatings
Review**
PAGE 26

Lucian Q. Moffitt, Inc. Acquired By BFGoodrich

BFGoodrich of Akron, Ohio, recently announced the acquisition of Lucian Q. Moffitt, Inc., also of Akron. The new subsidiary, a marine products distributor, will operate within BFGoodrich's Engineered Products Group and strengthen the company's standing in the marine market.

John Foulk, previously vice president of research and development for the Engineered Products Group, will become president of the new subsidiary.

Moffitt has been sole distributor of Goodrich Cutless® bearings since 1933. The founder, **Lucian Q. Moffitt**, was formerly bearings sales manager at Goodrich, which has held rights to the Cutlass name since 1922. The company has continually modified and improved the Cutlass bearing, and recently added a fiberglass-epoxy-backed bearing to its product line. Moffitt has expanded into application engineering and associated hardware products.

Cutlass bearings have a long record of success in marine applications due largely to their distinguishing characteristic—resilient rubber and its ability to resist abrasive particles wearing the shaft. BFGoodrich's basis for using rubber as opposed to traditional hard-surfaced material is its low friction coefficient when wet. Resistant to oil, grease, and most chemical solutions, rubber bearings are said to last up to 15 times longer than hard-surfaced bearings. Cutlass bearings currently dominate the market.

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\$33.1-Million Increase Awarded To Electric Boat For Ohio Class Material

General Dynamics, Electric Boat Division, Groton, Conn., has been awarded a \$33,100,000 face value increase to a previously awarded cost-no-fee contract for long lead time material for FY-85 Ohio class submarines. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

American Standard Offers Free Bulletin On CPD Heat Exchangers

New Bulletin 104-52, just published by American Standard Inc.'s Heat Transfer Division, of Buffalo, N.Y., gives full details of the CPD standardized, pre-engineered, heat exchangers with removable tube bundles.

Standardization and service ease keep downtime short. Models for

new applications can be computer-selected and assembled from pre-engineered components. The CPD series offers a wide variety of sizes from 3 to 8 inches in shell diameter, one or two passes, and shell options. ASME Pressure Vessel Code stamping is available.

Bulletin 104-52 provides full catalog dimensions, installation details, design pressures and temperatures and shell option information.

For full information and a copy of the CPD heat exchanger bulletin,

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Duranceau Joins Anixter As Area Manager

Mike Duranceau has joined Anixter Bros., Inc., as Area Manager for Idaho and Montana, it was announced by Roland Watkins, vice president of Anixter's Wire and Cable division.

Mr. Duranceau will direct sales of Anixter's complete line of electrical, electronic and communications wire and cable products to all markets in Idaho and Montana.

Eastern Marine Awarded Contract To Construct Auto/Passenger Ferry

Eastern Marine, Inc. of Panama City, Fla., recently signed a contract with Lake Champlain Transportation of Burlington, Vermont, for the construction of an automobile/passenger ferry. The vessel will have a length overall of 180 feet, beam of 43 feet 6 inches, and depth of 12 feet.

Lake Champlain Ferries presently operates seven vessels on three routes on Lake Champlain between New York State and Vermont. The new vessel will serve the route between Grand Isle, Vermont, and Cumberland Head, N.Y., which is within three miles of Plattsburgh. The company now operates two 140-foot boats on this crossing on a year-round basis. During the May through October summer season, 60-70 percent of the traffic on this route is commercial, the balance being tourist; during the winter season, 90 percent of the traffic is commercial and 10 percent tourist.

The new vessel under construction at Eastern Marine's yard is scheduled for delivery in September of this year.

Litton Awarded Navy Contracts Totaling \$21.8 Million For Gyrocompasses And Navigation Systems

Litton Systems Incorporated, Guidance and Control Systems, Woodland Hills, Calif., has been awarded a \$3,111,768 firm-fixed-price contract to exercise an option for eight advanced gyro compasses (AN/WSN-2), ancillary spares, equipment, data, and services.

Litton Systems was also awarded an \$18,750,000 firm-fixed-price contract for 33 AN/WSN-5 inertial navigation systems, ancillary spares, equipment, data, and services. The Naval Sea Systems Command, Washington, D.C., is the contracting activity for both contracts.

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Marinette Marine's unique \$7.1 million ship erection building, dedicated totally to the construction of minesweepers, is scheduled to be dedicated this spring.

Marinette Marine's \$7.1-Million Ship Erection Building Nears Completion

A unique, \$7.1-million ship-erection building is nearing completion at Marinette Marine Corporation's shipyard in Marinette, Wisc.

The massive, 69,700-square-foot facility is dedicated totally to the construction of minesweepers. A joint effort of MMC and Ayres Associates of Eau Claire, Wisc., its design was determined after extensive research, according to **Larry N. Hairston**, Marinette's vice president, marketing.

"Teams from MMC visited shipyards throughout Europe gathering information on the most advanced forms of ship erection in the world," Mr. **Hairston** says. "The result is a building which will enable us to produce two mine countermeasure vessels simultaneously, including fibreglassing and painting, in an environmentally controlled area."

One MCM vessel is now in construction at Marinette after receiving a \$41.9-million contract from the U.S. Navy last fall. Marinette currently is a finalist for a 17-vessel minesweeper/hunter (MSH) contract to be awarded by the Navy this summer.

Running through the center of the 205 by 340-foot complex is a three-tiered mezzanine that houses offices, tool rooms, sheet metal shops, pipe shops, electrical shops, general supply rooms and a cafeteria. Gangways to ships on either side of the mezzanine will provide quick access to supplies and enable materials and equipment to be moved on and off vessels with unusual ease.

"We've eliminated the need for traditional scaffolding," says Mr. **Hairston**. "Because workers won't be forced to do a lot of the unnecessary vertical movement required in more traditional shipbuilding

techniques, we'll save time and increase productivity."

Open areas below the mezzanine allow easy movement of equipment between the two shipbuilding areas. A material handling monorail above the mezzanine raises items to the proper level or can move them the length of the building.

Other features include two 50-ton cranes serving each shipbuilding bay, and giant, 70-foot-high doors, manufactured at MMC, consisting of six sliding panels which open to a width of 65 feet.

Knock-outs in ductwork along



Gangways from the mezzanine on the left and from walkways on the right provide quick access to ships under construction and eliminate the need for traditional scaffolding. At the front and rear of each bay, 70-foot high doors, consisting of 6 sliding panels, open to a width of 65 feet.

mezzanine walls will enable workers to connect flexible elephant-trunk tubing, which can be brought onto the ship to remove fumes from confined areas being painted or fibreglassed.

"A unique steel grid network in the floor of the building not only gives us an exceptionally strong, stable and flat building surface for accuracy control, but also contains large steel tubes, which can be opened to draw in fumes," explained Mr. **Hairston**. "The heav-

ier-than-air fumes, created during the fibreglassing of a hull, will be drawn below ground, filtered, and exhausted."

Although primarily designed for the construction of wooden MCM's, the facility is easily adapted to steel or fiberglass construction as well. This manufacturing flexibility and advanced auxiliary systems, Mr. **Hairston** adds, "will substantially increase our efficiency and productivity, whatever type of ship is constructed here."

The Flexitrend 4000 is an advanced, microprocessor-based control system developed by En-Tronic® Controls, yet is said to be easy to use and completely adaptable to the user's specific needs. It provides the application engineer with the computer power he needs to fully utilize his operating experience, yet requires no special computer knowledge.

For a free copy of the new brochure,

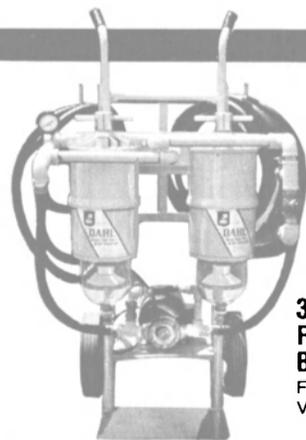
Circle 15 on Reader Service Card

New Brochure Describes Cooper Energy Services Modular Control System

A new six-page, full-color brochure from Cooper Energy Services gives detailed information of the Flexitrend 4000, a fully integrated, modular system specially designed for the control of gas turbines, steam turbines, reciprocating engines and compressors, station controls, and data collection systems.

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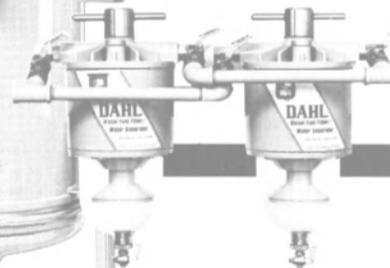
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U.S. shipyard officials tour NKS plant.

New \$27.9-Million NKS Plant In Mexico Will Supply Heavy Steel Forgings And Castings To Shipyards And Industry

Full Color Facilities Brochure Available

Shipbuilding executives from 14 major North American shipyards recently toured the site of the NKS steel forging and casting plant in Puerto Lazaro Cardenas on Mexico's West Coast. With an accumulated investment of 50 billion pesos (about \$27.9 million), Mexico will next year place in operation its first heavy manufacturing plant located in that municipality. Trial runs will begin in November of this year with the first tapping of steel, and production is scheduled for the first quarter of 1985.

Located on Cayacal Island, occupying an area of 52,600 square meters, the NKS plant is a result of a joint venture of Nacional Financiera (NAFINSA), the Mexican Development Bank; SIDERMEX, the official steel consortium of Mexico; and Kobe Steel, a leading Japanese steel producer.

Major equipment at the new NKS facility will include:

The steelmaking shop will be equipped with a 40-ton electric arc furnace, a 60-ton ladle furnace, and a vacuum degassing system. The steel casting shop will have a

130 ton maximum pouring weight and will be equipped with heat treatment furnaces (100/300). The steel forging shop will boast a 400/600-ton forging press and a 1,500-ton forging press. The machine shop will be equipped with horizontal lathes up to 300/2,200 (mm) x 15,000 (mm) N.C., vertical lathes up to 8,500/500 (mm) x 5,000 (mm) N.C., and horizontal milling machines up to 180 (mm) x 4,500 (mm) x 1.200 (mm) N.C. A 3,500-ton capacity hydraulic press and a 2,000-ton bending roll as well as a flame cutting machine will be installed in the heavy steel fabricating shop.

Annual Capacities

Steel making shop	90,000 tons (maximum pour 150 tons)
Steel casting shop	20,000 tons as cast
Steel forging shop	22,000 tons as forged (maximum single forging 130 tons)
Machining shop	165,000 hours
Heavy steel fabrication shop	10,000 tons

Guests from U.S. shipyards and other firms who recently toured the new plant included **Louis Minnett**, senior vice president, Amer-

ican Bureau of Shipping; Ing. **Luciano Derchi**, ABS representative in Mexico; **Lawrence Brown**, executive vice president, Jacksonville Shipyards, Inc.; **Paul Glaske**, president and **Bob Wallace**, vice president, Marathon LeTourneau Company; **Carlos Agnese**, vice president-contract administration, Norfolk Shipbuilding and Drydock Corp.; **Robert Kiefer**, assistant to the president, George G. Sharp, Inc.; **Frank Cruze**, director of purchasing, Tampa Shipyards, Inc.; **Paul O'Keefe**, vice president, Todd Shipyard Corp.

Representatives of NKS attending the tour included Lic. **Pablo Padilla Ramirez**, general director, Lic. **Alfredo Marquez Lopez**, deputy general director, and Sr. **Jose Carrasco Riojas**, commercial sub-director.

Lexington International Trading was represented by **Henry Engelbrecht**, president and **Darfoon Du**, North American sales representative.

Mr. **Ramirez**, general director of the NKS plant, informed the industry leaders that the new facility will provide Mexico with the

capability of producing forgings and castings up to 80 tons in weight with an annual capacity of 23,000 tons of forged parts, 20,000 tons of castings and 240,000 machine hours. The plant will offer to shipbuilders 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.

NKS deputy general director, Mr. **Lopez** and commercial sub-director Mr. **Riojas** reviewed the latest technology and engineering designs that are being incorporated into the new forging and casting complex.

The new plant will serve industries including the marine, naval, mining, petroleum, petrochemical, cement, sugar, electrical, nuclear, rail, iron and steel industries.

Several of the tour guests expressed definite intentions to place orders with the new NKS facility.

A free full-color 16-page brochure on the new NKS facility is now available. This book contains full details and drawings on the
(continued on page 10)

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In war, every battle is a fight to survive. And every technical advantage provides a chance to win.

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And the same technology we've used in U.S. Navy aircraft for over ten years.

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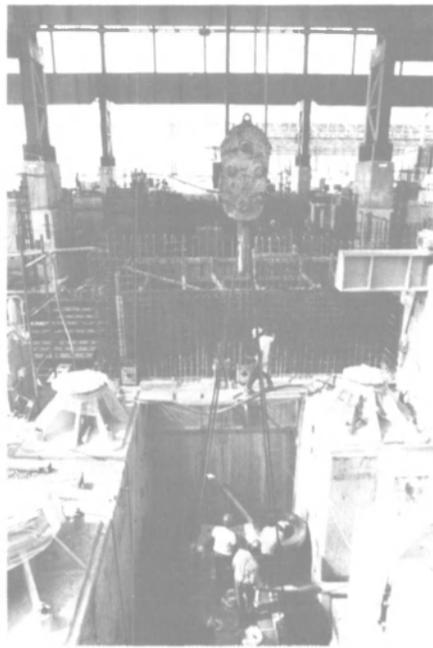
Grumman's partner for the ships control program is TANO Corporation — one of America's leading ships control designers. Together, we are the answer to distributed digital ships control.

Grumman/TANO: Two experts working toward one goal.



GRUMMAN





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

NKS Plant

(continued)

new plant layout, as well as data listing the heavy equipment in-

stalled and annual output of products from the steel making shop, casting shop, forging shop and heavy fabrication shop. Marine products include steam turbine rotor shafts and casings, rudder stocks, rudders, propeller bonnets, stern frames, sterntube bushings, propeller shafts and intermediate shafts. A full color cutaway illustration of a ship showing units manufactured, is included along with color photos of plant equipment.

For a free copy of the new NKS brochure, circle the number at the end of this article.

The NKS plant site inspection was initiated and coordinated by Mr. Engelbrecht, president of Lexington International Trading Company, North American sales agent for NKS.

Further information regarding this project may be obtained from Mr. Engelbrecht at Lexington International Trading, 551 Fifth Avenue, New York, NY 10176; (212) 697-3333, or from NKS Executive Offices at 404 Paseo de la Reforma, 06600 Mexico, D.F.

Circle 88 on Reader Service Card

\$12-Million Navy Contract Awarded GE For Attack Sub Propulsion Machinery

General Electric Company, Washington, D.C., has been awarded a \$12,000,000 fixed-price-incentive letter contract for one ship-set of main propulsion machinery for SSN-688 class submarines including main steam turbines, reduction gear and emergency propulsion system. The work will be performed in Lynn, Mass. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

New Navigation Lights Introduced By Perko —Literature Available

Four new electric navigation lights have been designed and developed by Perko, Inc. of Miami, the world's largest manufacturer of marine lights, hardware, and accessories. The new selection includes a 225-degree white mast-head light, red and green 112½-degree side lights, 135-degree stern

or towing lights, and all-round 360-degree lights.

Each light meets the U.S. Coast Guard requirements under 1972 COLREGS for use on all vessels from 65.6 to 164 feet long (20-50 meters). All are designed with cast bronze bases.

Additionally, a new plastic knob has been designed for Perko's windshield mounting brackets, allowing lights to be raised and lowered easily to their desired position and securing them firmly.

For a brochure covering Perko's complete line,

Circle 13 on Reader Service Card

GE Awarded \$24.58-Million Increase For Shipboard Electronic Subsystems

General Electric Company, Syracuse, N.Y., has been awarded a \$24,580,833 increase to a previously awarded cost-plus-award-fee contract for 14 AN/SQR-19 (V) ship-based electronic subsystems plus ancillary support items. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

Transamerica Delaval twin "Enterprise" DMR 46 engines (each 3500 hp), mounted on Chockfast Orange™, power the rugged workboats of Biehl, Inc. Kuyper gears with cast-in-place Chockfast alignment also help to assure powerplant dependability.



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High-performance products and worldwide service from factory-trained and certified chocking specialists. Chockfast Orange™ has earned a reputation for reliability ■ more than 15,000 main propulsion systems, plus ■ generators and auxiliary equipment ■ sterntube, strut, pintle, rudder and pedestal bearings ■ steering gears ■ engine-room and cargo pumps ■ anchor windlasses ■ bow thrusters ■ cable penetrations ■ stern winches.



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HISTORY

Founded in 1948, Main Iron Works, Inc.'s current facilities are available for construction of new vessels ranging in size from 45' to 250' in length. Dry docking and a full range of repair services are also available, including a complete machine shop facility, sandblasting and painting services.

With over thirty years experience and our record of service to the towing industry, Main Iron Works, Inc. is ready to serve the needs of our past, present and future clients

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Air control mechanics
Electrical repairs, trouble shooting
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A.B.S. approved for stainless steel
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Four Dry Docks:

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ON THE COVER



World's Biggest Syncrolift Now In Service At Todd's San Pedro Yard

A new \$47-million Syncrolift shiplift and land-level ship transfer facility, the largest and most technologically advanced installation of its kind in the world, was dedicated recently at the San Pedro yard of Todd Shipyards Corporation's Los Angeles Division. The Syncrolift is a product of Pearlson Engineering Company of Miami, a member of the NEI Group. Pearlson is a world leader in shiplift technology, and the only firm in the world devoted exclusively to the design and manufacture of shiplift systems.

In his remarks at the opening ceremony, Todd chairman **John T. Gilbride** said the installation is specifically designed for the repair and construction of naval surface combatants. It is also suitable for commercial vessels.

"This innovative system will increase the Los Angeles Division's construction capacity by 100 percent and its repair capability by 250 percent," Mr. **Gilbride** stated. "It will create approximately 800 new jobs and support a work force of up to 4,000 when used at full capacity when all work bays are

completed later this year. This would translate into about \$250 million in additional annual sales for this division," he said.

The Syncrolift will permit the San Pedro yard to perform multiple drydockings with one lift platform that hoists the ship from the water to land level, where it is towed onto a side transfer carriage and moved to any of five work areas. The platform, which can act as a sixth work station during peak periods, is powered by 110 15-hp electric motors. Lifting speed is approximately nine inches per minute; design maximum lifting time is 72 minutes. The platform, which measures 655 by 106 feet, can handle vessels with overall length of 780 feet and beam of 105 feet. Maximum lifting capacity, when docking directly on the platform without a cradle, is 22,200 long tons. Maximum draft over the cradle is 32 feet.

According to Todd president **Hans K. Schaefer**, the Syncrolift installation will enable the Los Angeles Division to achieve productivity gains resulting from:

- Multiple access to vessels undergoing overhaul and repair
- Better material handling and material flow, including repositioning
- Accelerated preoutfitting of modular units for hulls under construction
- Use of the shiplift as a launching platform in lieu of, or supplementing, the new construction in progress on the inclined ways
- Lessening of environmental constraints by working ships on land instead of at a wet berth
- Mechanical and electrical utility conservation, including recycling of processed grit materials.

The design of the installed and strategically spaced mechanical manifold and multi-service electrical stations and crane services at the work bays provides full service to single or double ship berths. The demands at each work bay were developed using peak loads and other requirements as stipulated for fully crewed Naval ships. Every anticipated requirement of the ship repair and modular assembly options, including outfitting at the land level berths, was given full consideration. Comparable services were designed for installation at the hoist platform to satisfy production requirements at that location.

At the dedication ceremony, chairman **Gilbride** also announced the formation of a Naval Technology Division, whose sole purpose is to develop new, cost-effective combatant ship concepts and lead ship designs for the U.S. Navy, such as the DDG-51 guided missile destroyer program, and for foreign navies ships such as the 1,800-dwt and 2,500-dwt corvettes currently under consideration by several countries.

The new Division, comprising surface combatant technical and management disciplines at both the Los Angeles and Seattle Divisions of Todd Pacific Shipyards Corporation, will be under the management of Los Angeles.

Other speakers at the Syncrolift dedication included **James Goodrich**, Undersecretary of the Navy and a former general manager of the San Pedro yard, and Vice Adm. **Earl B. Fowler**, commander of the Naval Sea Systems Command, the latter a key figure in recommending which shipyard will build the lead ship of the DDG-51 program.

"The Syncrolift is indicative of Todd's commitment to support and strengthen sea power for our nation's defense," said **Len M. Thorell**, Todd vice president and general manager of the San Pedro yard. "The Syncrolift will allow us to be more efficient in the repair and maintenance of large vessels, which will translate in cost savings for the Navy and our commercial clients as well," he stated.

Delta Announces Three Appointments

Three key appointments have been made at Delta Steamship Lines, a subsidiary of Crowley Maritime Corporation, according to a recent announcement by **Richard F. Andino**, Crowley senior vice president and general manager of its Latin American Division, New York.

Richard A. Simpson has been appointed vice president, marketing and sales. Mr. **Simpson** has more than 22 years' experience in the transportation industry, including marine, rail, trucking and intermodal modes. Now based at Delta headquarters in New York, he was formerly in charge of marketing and sales for Crowley's Caribbean Division, based in Jacksonville.

Theodore H. Ellis has joined Delta as vice president of sales, based in New York. Mr. **Ellis's** 23-year background in transportation includes several years in sales and management positions for Crowley. He was most recently vice president of national sales for a major motor carrier.

Kenneth N. Tice has been named assistant director of pricing. Prior to this appointment, Mr. **Tice** headed international pricing for Crowley's Caribbean Division, and before that he held management positions with a ship agency firm and a major U.S.-flag shipping company. He is based in New York.

Under Crowley's Latin American Division, Delta Line operates a fleet of U.S.-flag vessels providing containerized service between the three coasts of the United States and Latin America and West Africa.

Rockwood Introduces New Ball Valve Line — Literature Available

Rockwood Systems Corporation, Lancaster, Texas, has introduced a new ball valve line (900 Series). It is described in new literature as a stainless steel bar stock type ball valve that ranges from 3/8-inch to 2 inches.

Rockwood Systems, a leading manufacturer of quality ball valves, feels that this valve combines both outstanding quality and prices. The 900 Series joins the existing ball valve and safety relief valve lines Rockwood already manufactures.

The company maintains a quality control program that meets all of the specifications necessary to manufacture nuclear submarine ball valves for the U.S. Government and extends those standards into their other lines.

For free literature on the new 900 Series,

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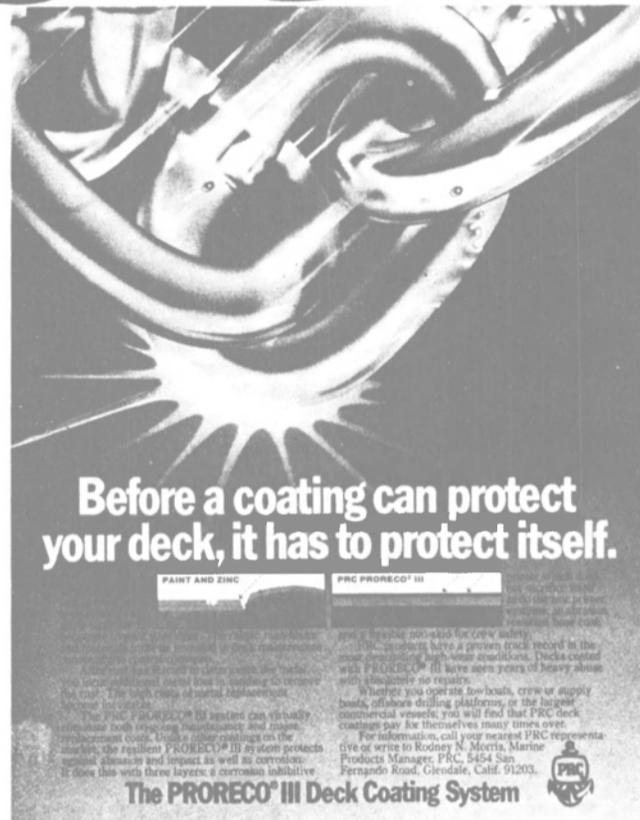
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**Harry S. Ford Promoted
To Vice President
At Autronica**

Autronica Marine U.S.A., Northvale, N.J., has announced the promotion of **Harry S. Ford** to vice president and director of technical services.

Autronica Marine U.S.A. represents the Norwegian Companies of

Autronica A/S and Moland Automation A/S, covering a board range of marine electronic monitoring and alarm systems.

Mr. **Ford's** extensive background in the electronic and marine field includes consulting, electronic systems design, marketing, and field service engineering. He has been involved with shipboard computerized controls, diesel engine condition monitoring sys-

tems, engine controls, automation equipment, and monitoring systems.

Mr. **Ford** obtained his B.S. degree in electrical engineering and his M.B.A. in management (for executives) from Fairleigh Dickinson University, Rutherford, N.J. His continuing education includes a micro-computer systems course at Massachusetts Institute of Technology, Dale Carnegie Leadership



Harry S. Ford

Course, and ship navigation, control, and power systems courses at A.E.G. Telefunken and C. Plath—Hamburg, Germany; Brissonneau and Lotz Marine—Nantes, France; Autronica Marine—Trondheim, Norway; WABCO Fluid Power—Lexington, Ky.; and Navidyne Corp.—Newport News, Va.

**Avondale Awarded \$58.6
Million Increase For
LSD Material Procurement**

Avondale Shipyards Incorporated, New Orleans, has been awarded a \$58,600,000 face value increase to a previously awarded fixed-price-incentive contract for procurement of long lead time material for the dock landing ship LSD-45 and LSD-46. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

**Blackmer Pump Offers
New Full-Line Catalog**

A new 28-page catalog from Blackmer Pump Division of Dover Corporation, Grand Rapids, Mich., presents their complete line of rotary positive displacement, sliding vane pumps for industrial processing and liquid transfer applications.

Included are pumps specially designed for handling corrosives, abrasives, lubricating and non-lubricating liquids, and liquids with viscosities to more than 100,000 SSU.

In addition to a description of the unique Blackmer design and operating features, the bulletin contains fully illustrated sections on individual pump series ranging in capacity from five to 2,200 gpm (18.9 to 8.327 liters/min) with operating pressures to 150 psi (8.8 kg/cm²) at temperatures to 500°F (260°C).

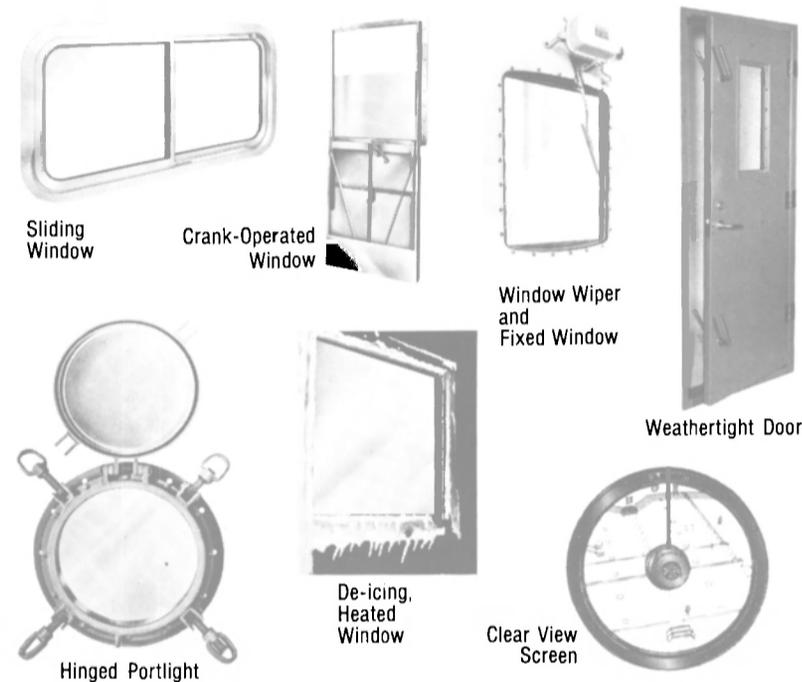
The features and options of each pump type are described, and performance charts and materials of construction for each model are provided along with available unit mounting arrangements and drive styles.

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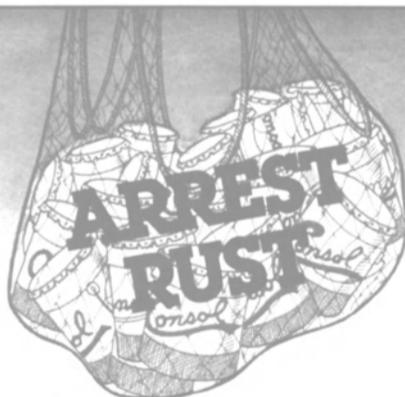
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Ruffner Named Vice President of Pott's Inland Waterways Division



David B. Ruffner

David B. Ruffner has been promoted to vice president sales-Eastern Region, it was announced by Richard A. Kienitz, senior vice president-marketing of the Inland Waterways Division of Pott Industries Inc. Pott Industries is a Houston Natural Gas Corporation company.

Mr. Ruffner will continue to maintain offices in Pittsburgh and will handle all marketing and sales activities in the Eastern Region, which includes all of the Upper Ohio area and East Coast cities of New York and Philadelphia. He will report to Jack Flahaut, vice president-sales, who is located at division headquarters in St. Louis.

Metro Machine Awarded \$9.6-Million Navy Contract To Overhaul LPD Trenton

Metro Machine Corporation, Norfolk, Va., has been awarded a \$9,645,175 firm-fixed-price contract for the regularly scheduled overhaul of USS Trenton (LPD-14). The Supervisor of Shipbuilding, Conversion and Repair, USN, Portsmouth, Va., is the contracting activity.

Westinghouse Awarded \$9.2-Million Increase For Nuclear Components

Westinghouse Electric Corporation, Plant Apparatus Division, Wilkins Township, Pa., has been awarded a \$9,210,000 face value increase to a previously awarded cost-plus-fixed-fee contract for naval nuclear propulsion components. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

MarAd Awards Cooperative Research Contract To Seaworthy

The Maritime Administration has awarded a \$342,500 contract to Seaworthy Engine Systems, Inc., Essex, Conn., as part of a cooperative research project to evaluate the benefits of applying exotic ceramic and metallic coatings to combustion system components of high-speed marine diesels.

The company will install and, according to a schedule, remove combustion system components being tested. It also will analyze and evaluate engine performance.

Two towboat owners and operators, Ohio Barge Lines, Inc., of Dravosburg, Pa., and Ingram Barge Company of Nashville, Tenn., are cooperating in the project, as is the Electro-Motive Division of the General Motors Corp. of La Grange, Ill.

Coatings will be selected, applied and evaluated by the Lawrence Berkeley Laboratory of the University of California under the supervision of the Department of Energy.

Under each of the two phases of the project, coated combustion system components (valves, pistons, heads, rings and turbo-chargers) will be installed in two high-speed diesel engines. The coated compo-

nents will be left in one engine for about 6,000 hours; selected components will be removed from the other at about 500-hour intervals.

In the first phase, to be completed in April 1985, the engines will operate on No. 2 marine diesel fuel. During the second phase, to be completed a year later, off-specification and blended fuels will be used.



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POSIDONIA '84

— A Preview —

Piraeus, Greece — June 4-9



Representatives of the world's maritime industries will come together in Piraeus, Greece for the Posidonia International Shipping Exhibition to be held June 4 through 9, 1984.

At the last Posidonia Exhibition in 1982, no fewer than 900 exhibitors from 45 countries took part, the highest number in the exhibition's 15 year history. In 1984, a similar number of exhibitors are expected to participate.

Posidonia provides a meeting point for many of the leading figures in the maritime world and the thousands of visitors it attracts include some of the most influential voices in shipping.

The one-day Posidonia Forum, run in conjunction with the week-long Exhibition, provides a platform from which their voices may be heard, and an opportunity for a meeting of minds on some of the key issues with which the maritime industries are concerned.

Opportunities for discussion on

a less formal basis abound, not only on the exhibition stands but also on the many receptions given by individual exhibitors.

Among them, the exhibitors represent every facet of the marine industries, from shipbuilding and marine equipment manufacture to shipbroking, insurance and banking.

Most of the leading maritime countries take nationally organized stands at Posidonia. This year, Italy and Korea join Brazil, Denmark, the Federal Republic of Germany, Finland, France, the German Democratic Republic, Japan, the Netherlands, Norway, Panama, Singapore, Sweden and the United Kingdom.

By tradition, the Exhibition is formally opened by the Greek

Minister of Mercantile Marine. At Posidonia '82, shipping ministers from six other maritime nations were also present and a similar representation is expected this year.

Posidonia '84 will be opened by the present Minister, **George Katsifaras**, on Monday, June 4. The Exhibition will be open daily until Saturday, June 9. The Forum will take place on Friday, June 8, at the nearby Eugenides Foundation.

The Posidonia International Shipping Exhibition is sponsored by the Greek Ministry of Mercantile Marine, the Municipality of Piraeus, the Union of Greek Ship-owners, the Greek Chamber of Shipping, the Association of Ship-owners of Greek Passenger Ships,

and the London-based Greek Shipping Co-operation Committee.

As the list of exhibitors for Posidonia '84 was incomplete at press time, the following is a list of exhibitors from the previous Posidonia.

INTERNATIONAL COMPANIES

American Bureau of Shipping
 Ameron Corrosion Resistant Piping Division
 Association of Danish Shipbuilders
 Association of German Machinery Manufacturers
 Association of the German Shipbuilding Industry
 Beckmann KG
 Berger Torpedo Marine Paints
 Boele's Shipyards & Engineering Co. Ltd.
 British Marine Equipment Council
 Camrex Ltd.
 Caterpillar Overseas S.A.
 Cell GmbH
 Centromor
 Cofrena
 Crescent Towing & Salvage Co., Inc.
 C.S.I. BV
 Danish Export Group Association
 Det norske Veritas
 Diesel & Gas Turbine Publications
 Electrolux-Wascator, Marine Division
 Ente Autonomo del Porto di Trieste
 Esabras - Associated Shipyards of Brazil
 Export Council of Norway
 Farboil Company
 Fincantieri
 Finnish Foreign Trade Association
 Fredriksstad Mek. Verksted
 General Electric Credit Corporation
 Germanischer Lloyd
 Granges Repair Service
 Greyhound Leasing
 Grindlays Brandts Ltd./Grindlays Bank Group
 Paul Hammelmann Maschinenfabrik GmbH & Co.
 Hellenic Mutual War Risks Association (Bermuda) Ltd.
 Hungarian Shipyards & Crane Factory
 Hyundai Corporation
 Inchcape & Co. Ltd.
 Industrial Newspapers Ltd.
 Inter Equipos Navales
 Jadranbrod
 Japan Ship Exporters' Association
 Koraboimpex
 Liguria Export-Consortium Promoting Export Trade
 Lloyd's of London Press Ltd.
 Lloyd's Register of Shipping
 Malaysia Shipyard & Engineering Sdn. Bhd.
 M.A.N.
 Marine Engineering/Log
 Marine Publications Int. Ltd.
 Marine Safety Services
 Maritime Reporter/Engineering News
 Marine Video International
 Medov/Burke & Novi
 Modern Corporation
 National Westminster Bank Ltd.
 Navimpex Foreign Trade Co.
 Netherlands Council for Trade Promotion
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 Norwegian Shipping News
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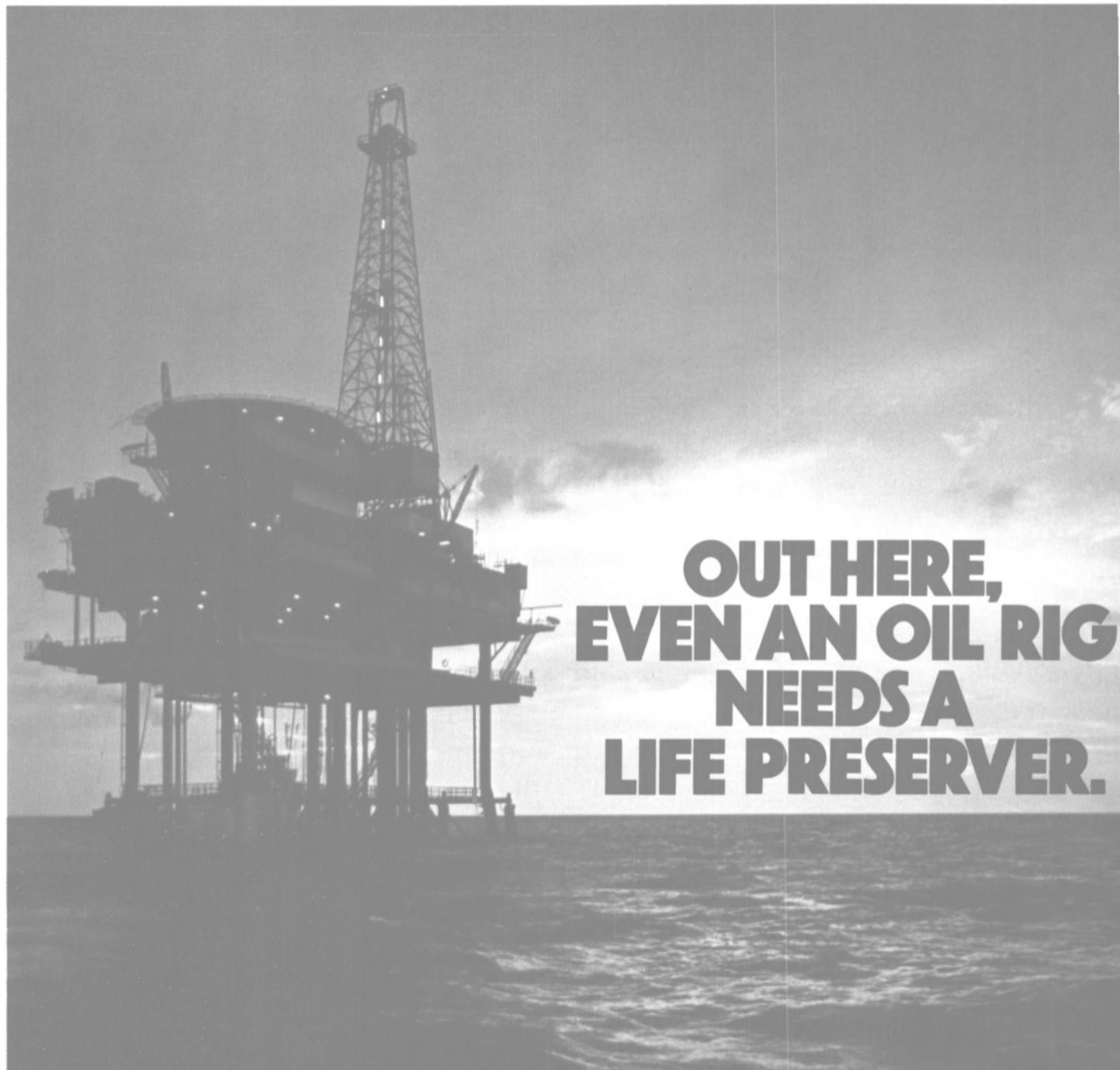
Simpson Spence & Young
 Singapore Association of Shipbuilders & Repairers
 Skuld, Assurance Foreningan
 Sperry Marine Systems
 Steamship Mutual Underwriting Association (Bermuda) Ltd.
 Oy Storkfors AB
 Sulzer Brothers
 Sunderland Steamship Protecting & Indemnity Association
 AB Svenska Flaktfabriken
 The Swedish Club

Swedish Trade Council
 Three Quays Marine Services Ltd.
 Transocean Marine Paint
 Turbo-Technik GmbH
 Veson, Inc.
 Walport Telmar International Ltd.
 West of England Ship Owners Mutual Insurance Association (London) Ltd.
 Zihni Group of Companies

NATIONAL COMPANIES

All Oceans General Shipyards B.V.
 A. Ahlstrom Oy Plywood Mill

Aalborg Shipyard Ltd.
 Arsenale Triestino San Marco
 A/S Atlas Marine
 Alexandra Towing Co.
 Alsthom-Atlantique
 Algemene Bank Nederland
 Alenco Deridder
 Babcock-Bristol Ltd.
 Babcock Product Engineering Ltd.
 Babcock Power Ltd.
 Bain Dawes (Hellas) Ltd.
 The Beldam Packing & Rubber Co. Ltd.
 (continued on page 19)



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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." ■

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 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. ■



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

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Posidonia '84

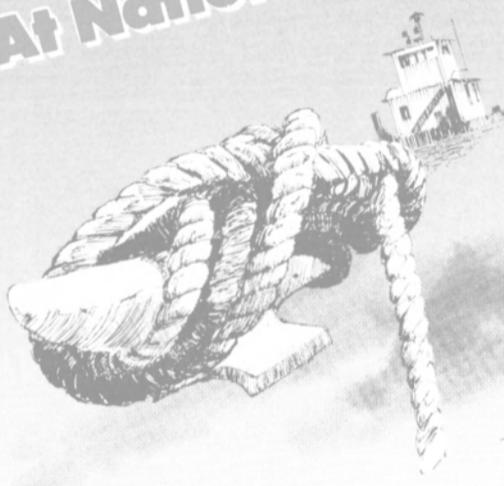
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Bremer Vulkan AG
British Airways
British Caledonian Airways Ltd.
British Hellenic Chamber of Commerce
British Shipbuilders
Brissonneau & Lotz
B&W Alpha Diesel AS
B&W Shipbuilding Services A/S
Burmeister & Wain Shipyard Ltd.
Butterworth Systems (UK) Ltd.
Cantiere Navale Breda
Cantiere Navale Luigi Orlando
Cantiere Navali e Officine Meccaniche di Venezia
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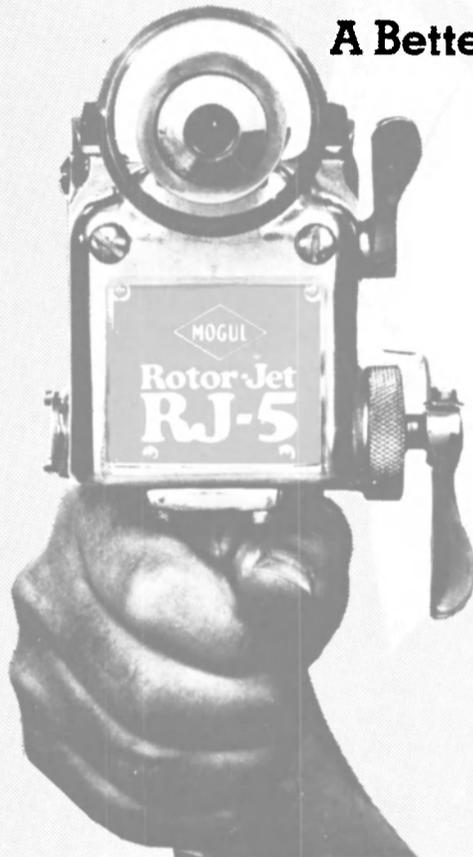
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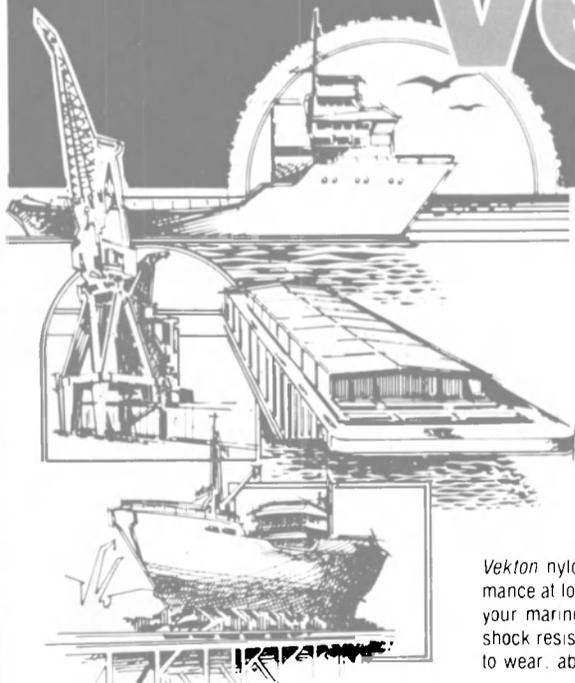
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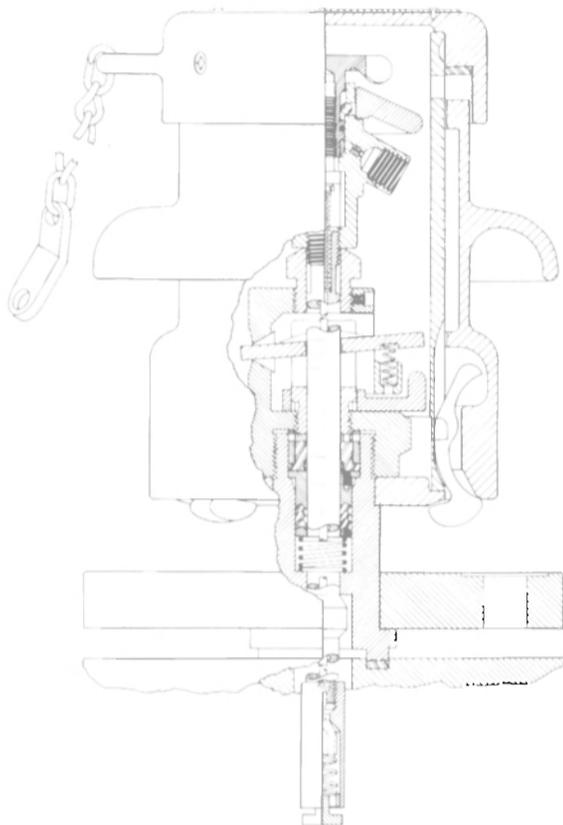
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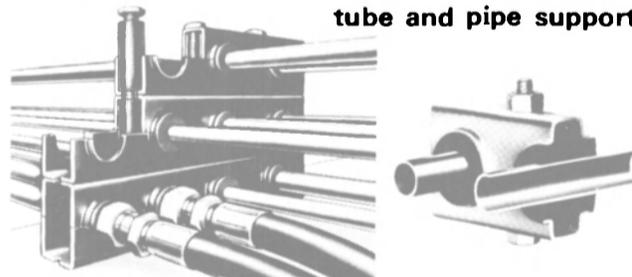
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Management Changes Announced By Hyundai



Suk-eui Hong

Suk-eui Hong, formerly executive vice president of Hyundai Heavy Industries Co. Ltd. (HHI), has been appointed executive vice president of Hyundai Mipo Dockyard Co. Ltd. (HMD), and **Chong-ki Kwon**, formerly director in charge of the Estimation Department, has been named director in charge of the Business Department.

Jong-sik Yang, senior manager and former representative at HMD's London office, has returned to the head office and is responsible for the Production Control Division, succeeding **Jong-ku Yoon**, who has retired.

Jin-yeol Lee, formerly senior vice president in charge of HMD's Production Division, and **Sang Yong Kauh**, formerly vice president of the Design Department, have been transferred to HHI.

Isotta Fraschini S.p.A.

Awarded Navy Contract

The U.S. Naval Sea Systems Command has awarded to Isotta Fraschini S.p.A. of Milan, Italy, a firm-fixed-price contract for production and support of amagnetic diesel engines to be installed in U.S. Mine Countermeasures (MCM) ships. The initial award provides for procurement of ID 36 SS6 V-A, diesel engines for MCM ship propulsion and power generation systems, technical data, and engineering services for 3 ships authorized by the U.S. Congress in fiscal year 1984, with options for the remaining nine MCM ships in fiscal years 1985-1987. Additional funding will be provided for spares, repair parts, and training services to be furnished by Isotta Fraschini.

Selection of Isotta Fraschini will make available to the U.S. Navy a permanently low magnetic signature engine and technology which has been proven and is operational in the Italian Navy Lerici class Minesweeper/Hunter ships.

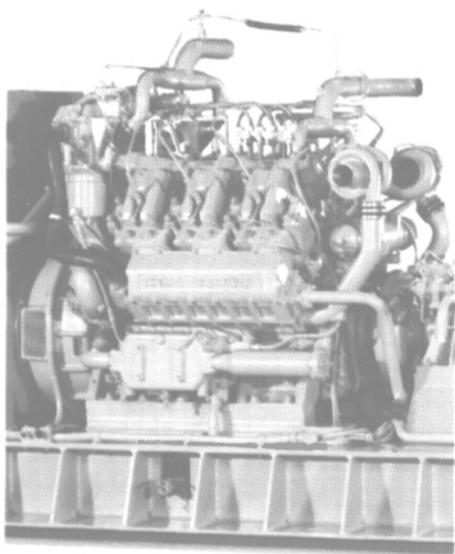
In expressing appreciation for the U.S. Navy choice, the chairman of Finmeccanica, Dr. **Franco Viezzoli** stated his company was particularly grateful to the U.S. Navy for the opportunity afforded to prove in the United States the excellence of Italian technology in diesel engines.

For complete literature fully describing the entire line of Isotta Fraschini diesel engines,

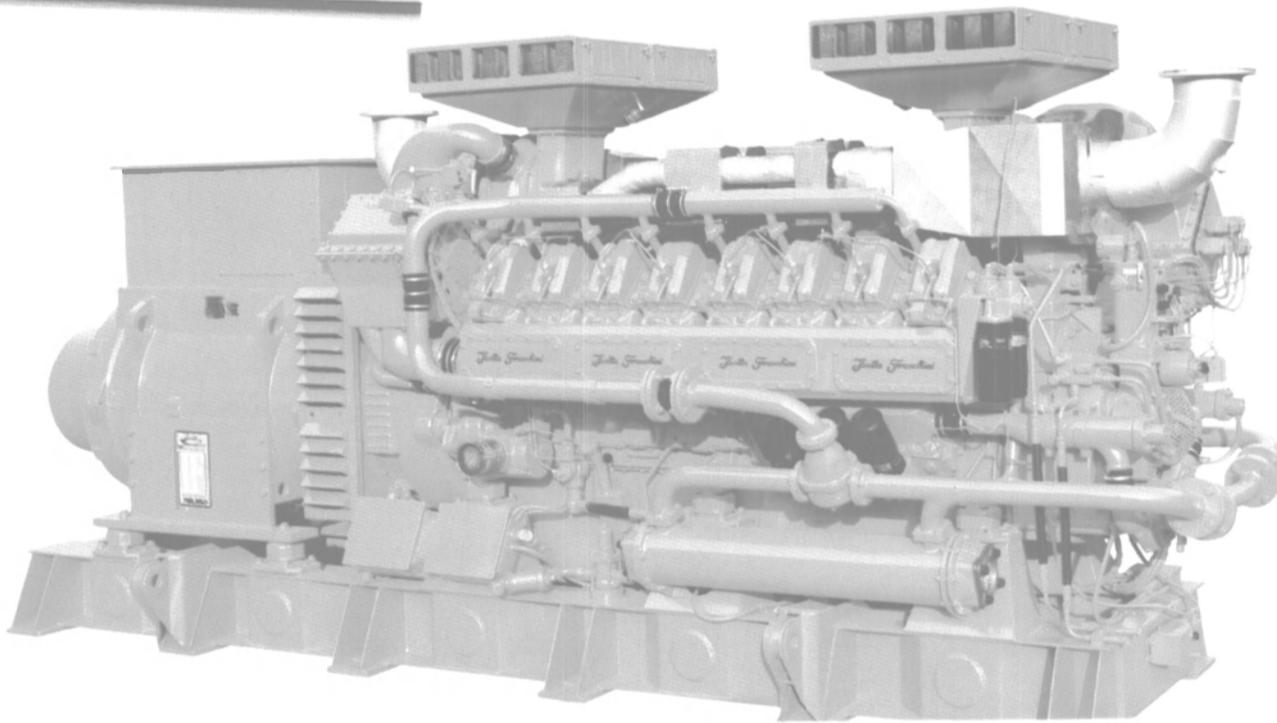
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Le Blanc Joins Moss Point Marine As Director Of Sales And Marketing

John Dane III, president of Moss Point Marine, Inc., Escatawpa, Miss., has announced that Joseph H. Le Blanc Jr., has joined their organization as director of marketing and sales.



Joseph H. Le Blanc Jr.

Mr. Le Blanc graduated from Tulane University with a bachelor's degree in mechanical engineering. He is a registered mechanical engineer in the state of Louisiana and is a member of the National Society of Professional Engineers, American Society of Mechanical Engineers, American Welding Society, Louisiana Engineering Society, and Propeller Club, Port of New Orleans.

He has been associated with steel construction for 30 years. His last 15 years in shipbuilding were spent with Halter Marine, during which time he held positions of yard superintendent, vice president of production, executive vice president, and president. Retired for one and one-half years, Mr. Le Blanc returned to Halter Marine's Marketing and Sales Department before resigning to join Moss Point Marine.

He will be sharing Moss Point Marine's office in downtown New Orleans with Chalin (Cop) Perez, vice president and General Counsel of the company.

Edo Awarded \$11.4-Million Increase To Navy Contract For Sonar Modifications

The Naval Sea Systems Command has exercised an option, under a previous letter contract with Edo Corporation, in the amount of \$11,401,000 covering improvements to 12 AN/SQR-18A sonar systems, converting them to AN/SQR-18A(V) 1 systems. This procurement includes ancillary spares, technical data, and field engineering services. Pending finalization of the price, the Navy has provided initial funding of \$6.5 million.

In announcing the Navy order, Frank Fariello, president of Edo's Government Systems Division, stated: "These improvements will significantly enhance operational performance of the AN/SQR-18A systems currently in the Navy. There are approximately 40 systems to which these improvements

are applicable; this award brings to 18 the number of systems for which modifications have been procured. Further improvements to the systems are in the discussion stage with the Navy." Work on this new contract will be done at the Division's facility in College Point, N.Y.

Ship Structure Committee Publishes Six Technical Reports

The Ship Structure Committee recently published six new technical reports which are available free of charge until copies run out.

After which, the reports will be available from the National Technical Information Service (NTIS).

The reports are: SSC-314, "Pressure Distribution on Models of the SL-7 Containership and Great Lakes Bulk Carrier S.J. Cort in Waves," presents data from various pressure taps on the respec-

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tive ship models. A future report will compare computer calculations with full-scale and model test results.

SSC-315, "Fatigue Considerations in View of Measured Load Spectra," documents experimental work, including data analysis, used in assessing the characteristics of fatigue crack propagation under

load spectra typical of those experienced by ships at sea. Such information was obtained from the SL-7 containership instrumentation program. Results of these random loadings are compared with constant amplitude loadings.

SSC-316, "Ship Structure Committee Long Range Research Plan," outlines the research needed be-

tween now and the year 2000 to be prepared to meet the demands on the marine industry by that time. A listing of necessary project areas is included.

SSC-318, "Fatigue Characterization of Fabricated Ship Details for Design," presents a fatigue design procedure for ship details that should help to eliminate cracks

in details. It is an important part of the Ship Structure Committee's overall program to provide information on sound and economical details for ship structures.

SSC-320, "A Study of Extreme Waves and their effects on Ship Structures." This report represents one of the technical community's earliest efforts to describe, quantify, catalogue and assess the characteristics of extreme waves. It is intended that future efforts in this area will focus on recreating the various types of extreme waves in model tanks in order that each ship design could be evaluated for its own response.

"Ship Structure Committee Publications—A Special Bibliography." This report documents the reports published by the Ship Structure Committee through 1981 and gives a brief description of each.

For copies of these reports or further information, contact Lt. Comdr. **David B. Anderson**, Secretary, Ship Structure Committee, Coast Guard Headquarters (G-MTH-4), Washington, D.C. 20593. SSC-317 and SSC-319 will be published at a later date.



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Stocks and engineering services available in the United Kingdom, Norway, Denmark, Finland, Germany, Italy, Greece, Taiwan, Japan and Singapore.



Electric Boat Awarded \$12.1-Million Increase For Trident Design Services

General Dynamics Corporation, Electric Boat Division, Groton, Conn., has been awarded a \$12,100,000 face value increase to a previously awarded cost-plus-fixed-fee contract for the Design Agent Services (DAS) for Trident II (D5) capable Ohio class submarines. The Naval Sea Systems Command, Washington, D.C., is the contracting activity.

Mueller Steam Specialty Introduces Basket Strainer — Literature Available

Mueller Steam Specialty has literature available on its new easy-open basket strainer. It is designed to provide maximum straining protection for costly pipe line equipment and at the same time for quick, easy servicing. The quick-opening cover is secured with non-yoke type knobs. The cover and basket are O-ring sealed to minimize gasket replacement and service time. The basket O-ring seal also prevents particle bypass so that the strainers can trap particles as small as 5 microns when the appropriate wire mesh lining is specified.

Mueller Steam Specialty basket strainers are available from stock in cast iron, carbon steel, stainless steel and bronze. Standard basket material is stainless steel. Special materials, baskets and coatings are available on request.

For more information and free literature on the basket strainers,

Circle 83 on Reader Service Card

◀ Circle 265 on Reader Service Card

Marine coatings & corrosion control

Manufacturers and suppliers of marine coatings and other corrosion-prevention measures continue to improve their products and services. In the important area of reducing fuel consumption, a new generation of self-polishing, antifouling hull coatings, and improved methods of underwater hull cleaning have been introduced.

New high-performance epoxy and polyurethane coating systems are now available that provide superior protection for tank interiors, decks, and other areas. These are but a few of the many new products developed to fight the multi-million-dollar problem of corrosion in the marine environment.

The editors of MR/EN asked the manufacturers of coatings and other corrosion-control products to tell us about their latest developments in products and services. The review that follows is based on replies that we had received up to press time.

FOR MORE INFORMATION

If you wish to receive additional information on any particular products in the following review, circle the corresponding reader service card number(s) on the reader service card in the back of this issue.

If you wish to receive information from all the manufacturers and suppliers of marine coatings and corrosion control equipment included in this review,

Circle 20 on Reader Service Card

AMERICAN ABRASIVE

Circle 21 on Reader Service Card

American Abrasive Metals of Irvington, N.J., manufactures Epoxo, a safety coating that provides sure-footed, non-slip, long-lasting traction. Originally developed for use by the U.S. Navy, Epoxo has been used on the flight decks of all aircraft carriers since 1962. It provides vital, non-skid safety for helicopter landing pads on offshore rigs. The safety coating is also suitable for use on ramps, passageways, engine rooms, equipment storage rooms, and shop areas—wherever slippery surfaces exist.

Epoxo's tough epoxy binder resists gouging, impact, and chip-

ping. It locks in the coating's near diamond-hard abrasive granules, preventing them from being loosened or kicked out. Epoxo is said to maintain its highly effective non-slip properties five times longer than sand and paint.

It is unaffected by seawater, oil, gasoline, grease, and chemicals, and can be rolled, troweled, or sprayed on. A two-man team can roll up to 1,000 square feet per hour. Epoxo is available in a variety of colors and in 1- and 5-gallon containers.

AMERON

Circle 22 on Reader Service Card

Ameron Protective Coatings Division of Brea, Calif., provides a full line of high-performance marine primers and coatings developed and tested in marine research laboratories worldwide. They effectively protect vessels from corrosion and from animal and plant growths (bottoms) under dynamic and static conditions.

Products introduced recently include: Amercoat® 2438, an abrasive antifoulant; Amercoat 2161 and 2162, the most recent inorganic antifoulants and a bold advance into a new technology; and Amercoat 346, a high-performance tank lining for marine chemical carriers.

Amerlock®/400 was introduced in 1983. This is a new, high-solids, self-priming topcoat specifically developed for the maintenance of steel surfaces. According to Dr. Raymond Foscante, technical director of the Ameron Protective Coatings Division, "Years of company research and development have culminated in the Amerlock concept whereby the advantages of epoxy resin chemistry can be fully realized in a coating composition that facilitates one-coat, high-build application. The formulation is not only designed to maximize corrosion protection where surface preparation is rigorous, but also to provide extended performance on minimally prepared surfaces."

Ameron introduced the inorganic primer Dimetecote® to the marine industry 40 years ago. Today, its revolutionary protection of steel surfaces in corrosive environments continues with a variety of formulations available to suit a

wide range of corrosion-resistant marine applications.

Ameron continues to expand its international network of qualified marine representatives, worldwide manufacturing operations, and warehousing facilities. Most recently, the Sam Hua Paint Industrial Company, Ltd., Republic of Korea, joined the list of licensed coatings manufacturers, and the Ameron-affiliated company, Oasis-Ameron, Ltd., began production on the Gulf Coast of Saudi Arabia in 1983. Fifty countries have Ameron representatives supporting the marine coatings industry.

ARNESSEN

Circle 23 on Reader Service Card

The Arnessen Corporation's Corrosion Dynamics Division of Roselle, N.J., provides a complete line of heavy-duty descaling and high-pressure air/water cleaning devices for removal of rust, scale, and old paint from ships, barges, offshore rigs, storage tanks, and other structures.

Among the quality tools and equipment offered by Arnessen are chipping hammers, deck scaling machines, needle scalers, and water/air cleaning machines.

The company's SSS high-pressure water cleaning system solves the problem of cleaning the holds of both large and small bulk carriers and similar vessels, as well as the insides of land-based steel storage tanks and other interiors. The system is based on the use of compressed air to increase the speed and throw of a water jet. It is simply connected to a ship's water-on-deck line and the service air line. A new nozzle design feeds the compressed air so as not to split and spread the water column.

The Model SSS-100 Mini-Gun is small, light, and specially designed for deck, superstructure, and hold cleaning in ships and other enclosures where headroom does not exceed 35 feet. The Model SSS-200 Combi-Gun is primarily intended for the hose cleaning of high holds, tall superstructures, ships' sides, etc., but is equally effective for other cleaning. Its powerful jet and high washing efficiency make prior sweeping unnecessary. Hot water can be used to speed removal of greasy deposits and stubborn dirt.

ATLANTIC SANDBLASTING

Circle 24 on Reader Service Card

Atlantic Sandblasting and Coatings, Inc. of Tampa, Fla., has been in business for more than 25 years, and is the largest marine sandblasting and coating company performing internal tank coating. Last year numerous ships, including the aircraft carrier USS Nimitz, were sandblasted to SA 2½ or SA 3 standard and coated with inorganic zincs, epoxies, phenolines, and chlorinated rubbers. On all systems Atlantic applies a stripe coat to all rat holes, lightening holes, edges, etc. This coat insures adequate mil thickness and added protection to hard-to-reach areas.

Atlantic uses suspended cable type, expanded metal staging. This allows complete ventilation, better illumination and visibility, which insures uniform coating application. This type of staging also provides complete protection of blasted surfaces by allowing the de-humidified air to reach all surfaces.

By varying the blasting abrasive and pressures to suit the condition of the steel, coupled with pre-cooled and dried compressed air, de-humidification and dust-collection equipment, Atlantic achieves the optimum quality in surface preparation.

Atlantic's Tampa facility has been operational for more than 2½ years, and offers 2,000 feet of berthing at a 26-foot draft; 3,000 amperes of 440/480-volt, 60-cycle ac electric power; and complete water, air, and sewage services. During this time the facility has serviced more than 50 vessels in Tampa for lay-up, sandblasting and coating, and topside ship repair.

Increased productivity at the Tampa facility enables Atlantic to perform sandblasting and coating work, including all associated services, at an approximate savings of \$1.00 per square foot less than prices offered by ship repair facilities. These savings are passed directly to the owners.

Atlantic maintains that in the more than 25 years of operation it has never had a coating failure nor has it ever failed to meet a delivery schedule.

(continued on page 28)

Which of these two towing companies is better?



If you think you see only one towing company here, you're only half right. Because in actuality, Bay-Houston Towing is the product of two companies, Bay Towing and Houston Towing, who merged in 1948 to form the largest and most capable harbor fleet in the Texas area.

So when it comes to the question of which towing company is better, the answer is easy. The one towing company that's really two -- Bay-Houston Towing Company.

B **BAY-HOUSTON TOWING CO.**
HARBOR AND COASTWISE TOWING
Houston • Galveston • Corpus Christi • Freeport • Texas City

Marine Coatings Review

(continued from page 26)

AURAND

Circle 57 on Reader Service Card

An improved, low-cost method for removing corrosion, paint, scale, rust, and other accumulated coatings from steel or any other hard surface in a marine environment is offered by Aurand Centrif-Clean Tools, of Cincinnati, Ohio.

The exclusive Centrif-Clean system combines the Aurand technique, proven over more than 35 years, with a new modern design. The cleaning and chipping power is delivered by a patented bundle of multi-toothed circular cutting wheels, loose-pinioned around a rotating head. The head revolves at high speed, using centrifugal force to throw the cutters' specially designed teeth against the surface to be cleaned.

The cutters are of high grade tool steel, specially heat treated and hardened. They feature a new design with increased cutting surface that means greater capacity and longer wear. In addition, Aurand cutter bundles are easily replaced and are interchangeable between different Aurand cleaning tools. The thoroughness of the Centrif-Clean method also usually means less frequent cleaning.

All Aurand tools feature an adjustable depth shoe set by the operator to limit the impact of the cutters. This feature protects the surface being cleaned and insures uniform cleaning action, preventing excessive cutter wear. The tools are lightweight, easy to handle, and have durable cast aluminum housings.

The Aurand Centrif-Clean equipment is available in both electric and pneumatic models. Electric tools are available in 115 and 230-volt models, with 1/8 or 1/2-hp AC or DC universal motors, and 15 feet of three-conductor cable.

The pneumatic tools feature rotary type air motors, in 1/2 or 2 1/2 hp sizes, free from toggles, pistons, or reciprocating parts to eliminate vibration. Units operate on 70 to 100 pounds air pressure.

Models are available with cleaning areas 5-inches, 8-inches, or 13-inches wide.

BUTTERWORTH

Circle 25 on Reader Service Card

Butterworth Inc. of Houston, an Exxon affiliate, has designed a 20,000-psi Liqua-Blaster to take high-pressure water jetting technology from the laboratory stage to practical field applications. The 620 Liqua-Blaster allows one operator to control 130 horsepower of water using 10 gallons per minute.

The unit not only cleans more efficiently, it also removes deposits

that could not be removed at all with lower pressure water jets or sandblasting. Using 20,000-psi water only, a "white metal" finish can be obtained free of corrosion cells and other impurities that interfere with paint life. And there is no dust.

The 20,000-psi blaster removes deposits two to three times faster than 10,000-psi units, and it is

possible to achieve "near white" to "white" metal conditions on older steel and rusted surfaces. The Liqua-Blaster also removes refractory build-up, concrete, aggregate, and marine growth.

The blaster is powered by a 150-hp GM Detroit Diesel 4-71 engine. Safety features are built into every facet of the unit, from the 55,000-psi burst pressure hose to

the 30,000-psi, proof-tested, stainless steel gun. All components have at least a 2.5:1 safety factor.

The heart of the system is the new Partek in-line pump. The in-line cylinder is manufactured of stainless steel and the internal surface of the cylinder has passed a special treatment to eliminate fatigue failures under continuous 20,000-psi operation.

abra

The problem... The solution...

The

The problem:

The boottop area of the 52,000 dwt container vessel 'Transvaal', owned by Deutsche Afrika-Linien, West Germany is subject to regular fender, quay and lock damage which in turn causes corrosion.

The solution: Intershield



The proof:

In December 1982, after 14 months trading with Intershield applied to the boottop area the vessel was inspected and had approximately 0.1% corrosion—including an area severely indented by lock damage (fig. 1). At drydock after a further 9 months in service having been subjected to 25% mechanical damage on the starboard side but corrosion limited to only 0.3%, the owners extended the Intershield area. As a result of this success a second vessel 'Tabora', has also been coated with Intershield.



The problem:

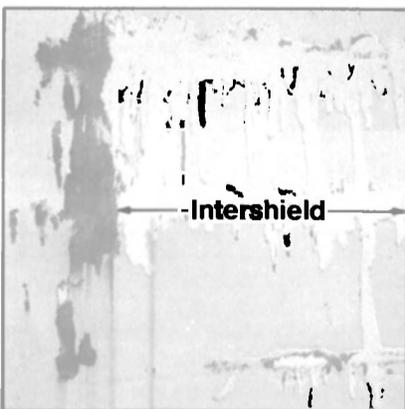
All VLCC's suffer severe abrasion damage on fender areas (fig 1). Traditional anticorrosives require expensive repair at each drydocking.

The solution: Intershield



The proof:

In June 1983, after 18 months in service with Intershield applied to 6 fender areas, 'Agip Campania' belonging to SNAM SpA was inspected in Genoa. In spite of heavy fender damage as indicated by the removal of the blue antifouling (fig 2), negligible corrosion was reported. Expensive fender area maintenance can be avoided.



The problem:

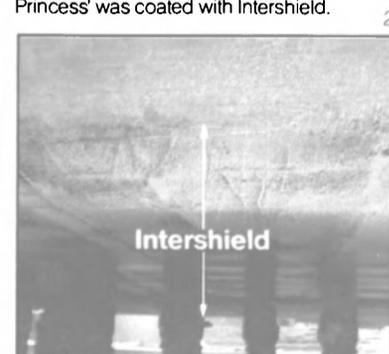
Vessels operating in shallow waters can suffer severe scouring damage on the flat bottom resulting in costly heavy corrosion.

The solution: Intershield



The proof:

'Darnia' a 2,800 grt Ro-Ro owned by Sealink (Scotland) passes regularly over sand bars when approaching Stranraer, Scotland. In December 1982, 8 months after application, the Intershield areas were found to be 70%-100% intact (fig 2). In contrast less than 40% of the conventional coatings remained (fig 1). Following this success the complete flat bottom of the sister vessel 'Antrim Princess' was coated with Intershield.



In independent field tests, Coastal Science Associates compared the Butterworth 20,000-psi Liqua-Blaster with abrasive-blasted surfaces. They reported, "At 20,000 psi, we got to white metal ... clean of hidden corrosion cells."

Butterworth Inc. has been a leader in high-pressure water jetting technology for more than 20 years. With equipment offering

pressures from 3,000 to 20,000 psi and a variety of flow rates, the applications are unlimited.

BYWATER COATINGS

Circle 26 on Reader Service Card

Bywater Coatings Company of Belle Chasse, La., is now a member of the Brink/Molyn Group of

the Netherlands and its subsidiary, MCS Marine Coatings and Services. This came about through the recent acquisition of Bywater by Brink/Molyn Beheer N.V.

The Byco-MCS marine line will continue as before with the addition of MCS products, along with the availability of the combination on a worldwide basis.

Two new products of interest to

the marine user are 316 epoxy mastic and 950 urethane/aluminum primer. Both products exhibited excellent adhesion to marginally cleaned steel surfaces (ST-3) along with a low moisture vapor transmission rate.

Byco-MCS 316 epoxy mastic is manufactured in two colors, red oxide and aluminum. It can be applied in a single coat to 16 mils dry, and does not need a primer. Its high solids (84 percent) make it economical to apply. The 316 can be used in both ballast and cargo tanks.

Byco-MCS 950 is a single-package urethane/aluminum primer. Topcoats of epoxies and urethanes make it a superior barrier coat system.

Byco-MCS Moluspeed 593 is the latest addition to the company's antifouling line. It was developed with the latest technology in copolymers and toxicants. The 950 is based upon the combination of slight paint-film solubility and leaching.

CHESTERTON

Circle 27 on Reader Service Card

The Industrial & Marine Products Division of A.W. Chesterton Company of Stoneham, Mass., has developed, over a seven-year period, the antifouling coating OMP, which effectively retards growth of marine organisms and algae on ship hulls.

Three different coatings have been formulated: #210 OMP, which has the slowest extraction rate. It is designed for strong currents and/or when a vessel is in continuous service. A thickness of 150 microns should be applied.

#220 OMP is designed for use in moderate currents and for vessels at sea half the time. A thickness of 245 microns is recommended. #230 OMP has the fastest extraction rate, and should be used where there is little or no current, and on vessels that are anchored most of the time. A thickness of 295 microns should be applied.

OMP coatings can be applied by brush, roller, or spray. Its effectiveness is traced to a controlled release of an organometallic antifoulant that is part of the product's binder system, and, unlike conventional coatings, is not mixed into the product.

CHUGOKU MARINE

Circle 28 on Reader Service Card

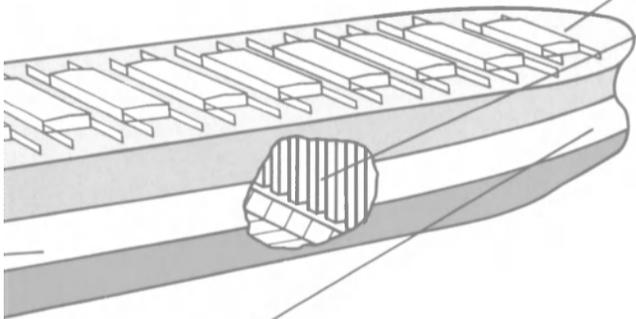
Chugoku Marine Paints, Ltd. of Japan recently introduced a new family of self-polishing, antifouling hull coatings. These new products are based on the formulation technology of the company's AF-SEAFLO Z-100 paint that was developed five years ago and is now (continued on page 30)

sion

High maintenance costs due to corrosion

Intershield abrasion resistant coatings

proof...



The problem:

Decks, particularly in work areas, suffer from corrosion caused by mechanical damage (fig 1). This requires frequent maintenance, may be hazardous and is unsightly.

The solution: Intershield



The proof:

Intershield was applied to selected deck areas, including around the manifold area, of a 20,000 dwt coastal tanker in April 1982. After 9 months the vessel was inspected and the Intershield coated areas were reported to be 100% intact (fig 2) in spite of numerous loadings and unloadings of cargo.



The problem:

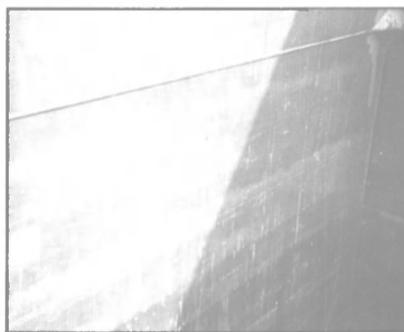
Corrosion in holds caused by cargo damage necessitates frequent and costly maintenance and can lead to cargo contamination.

The solution: Intershield



The proof:

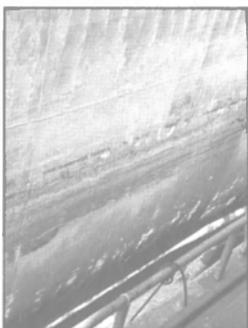
In May 1982, half No 5 hold in 'Star World', managed by World-Wide (Shipping) Hong Kong was coated with Intershield, the remainder with a standard epoxy coating. Within 3 months these latter areas were showing corrosion (fig 1), while the Intershield areas were 100% intact. In June 1983, the superior and near perfect condition of Intershield is clearly evident as seen below (fig 2). As a result holds in both 'Star Hong Kong' and 'Star Magnate' are now coated with Intershield.



The problem:

The 'Corner Brook' a 7,722 dwt Ro-Ro, owned by Sig Bergesen d.y. and Co of Norway suffers severe corrosion from ice abrasion for approximately 5 months of the year.

The solution: Intershield



The proof:

At drydocking in September 1983, after 25 months trading with Intershield on the bow area, the coating was 99% intact (fig 2). Areas coated with traditional anticorrosive were 75% corroded (fig 1). The rest of the underwater hull has now been blasted and coated with Intershield. This is the second vessel for Sig Bergesen d.y. and Co., to be coated with Intershield on the entire underwater hull.



Inter
SHIELD
Abrasion resistant coatings



Already proven on more than 6 million dwt of world shipping

Circle 135 on Reader Service Card

Marine Coatings Review — Chugoku

(continued from page 29)

in service on more than 500 ships worldwide.

In AF-SEAFLO Z-100 HS, volume of solids has been increased substantially 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 good antifouling activity for a

longer period. They can be applied without extensive hull blasting, in some cases over existing conventional paints.

C.I.E.

Circle 29 on Reader Service Card

C.I.E. Sandblasting & Coatings Company of Sarasota, Fla., is a

complete service sandblasting and coatings company, with mobility for on-site job services. C.I.E. offers coatings from a variety of manufacturers, meeting the demands of heavy-duty marine corrosion.

C.I.E. gives its customers specifications, application techniques, and inspection data, meeting the manufacturer's requirements on all coatings.

The company also offers a consulting service designed to give shipyards, drydocks, and other marine facilities complete information and techniques in sandblasting and coatings operations.

CLARK PAINTING

Circle 30 on Reader Service Card

Clark Painting Company of Concord, Calif., is a well-established firm with many years of experience in the industrial and nuclear field of corrosion control and coatings application. It recently expanded its operations into the marine market. **Fred Cagle**, president and CEO, has appointed **David R. Talbot** marine manager for the newly formed Marine Division. Clark is expanding its services to include commercial and government vessels and offshore drilling platforms.

Clark Painting will be utilizing the latest state-of-the-art equipment available to the industry. It intends to offer its new marine customers the same consistent, on-time, on-budget services that it has provided for its many commercial and industrial customers, past and present.

The company has the capability and financial resources to provide the following: bonding and warranty; detailed estimating and proposal service; professional staff of managers and superintendents; quality work force; equipment inventory and resources to handle all jobs, large or small; and engineering, design, and construction of specialized equipment, blasting, and painting facilities. Services are provided worldwide, with offices throughout the U.S., and in Indonesia and Saudi Arabia.

CLEMCO

Circle 31 on Reader Service Card

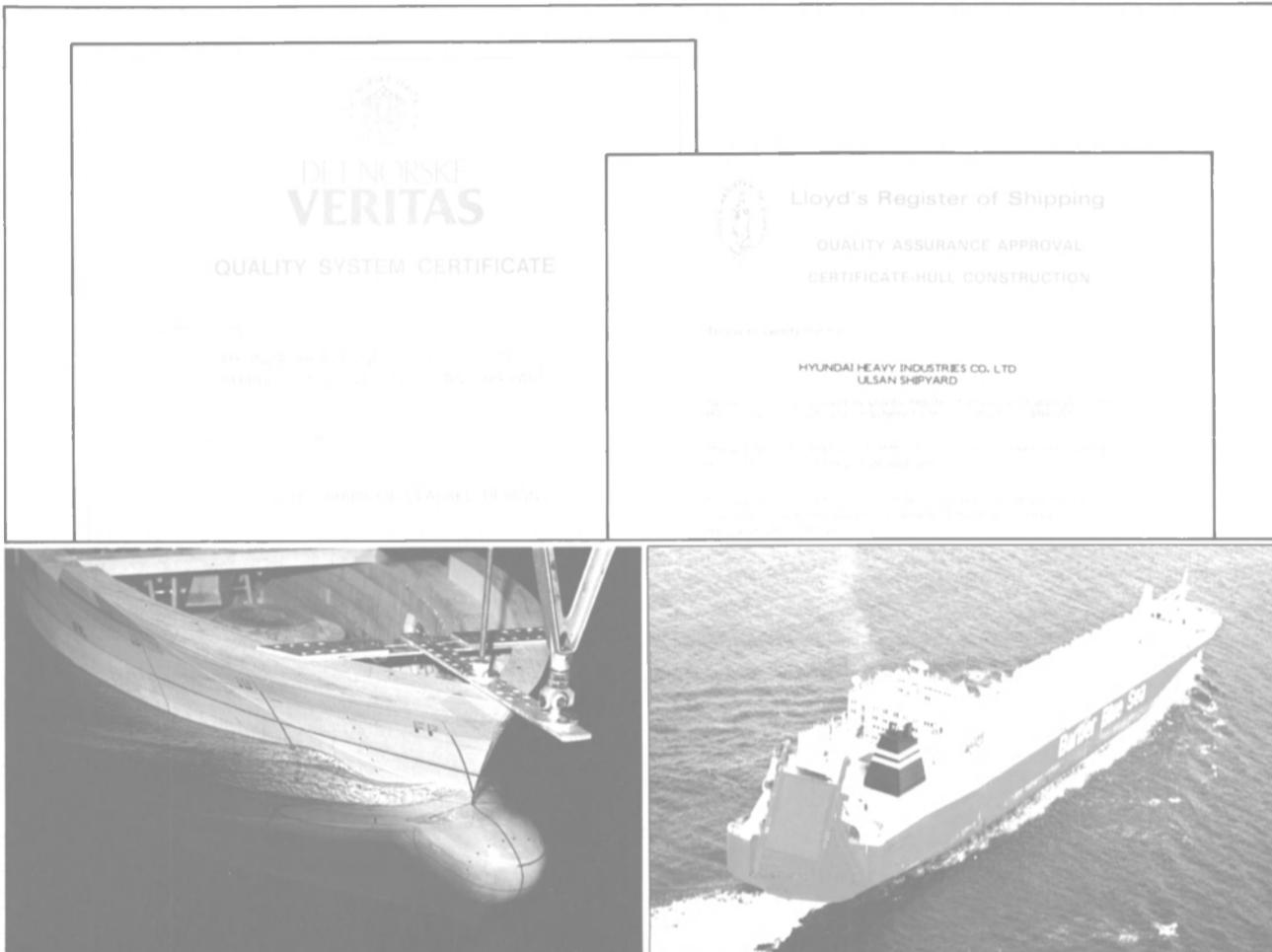
Clemco Industries of Burlingame, Calif., recently announced an addition to its abrasive blast equipment line, a Wetblast Injector System that eliminates dusty blasting environments without detracting from abrasive cleaning speed.

A water-jetting design combined with precise metering improves abrasive velocity rather than

(continued on page 33)

Posidonia 84
PIRAEUS GREECE 4-9 JUNE 1984

See Us at
Korea Stand (Nos. B604 & 415).



"Our R & D Means Your Economy"

Hyundai has always given top priority to research and development to provide our clients with quality vessels at competitive prices.

It is our pleasure and honour to announce that Quality Assurance Certificates have been awarded to us by international authorities such as Lloyd's Register of Shipping and Det Norske Veritas. We have also opened the Welding Research Institute and are now constructing a model ship basin to develop

economy vessels. Thus, we will complete the Integrated R&D Institute at our yard this year.

We will continue to advance our shipbuilding technology through R&D programmes centered on the development of future vessels.

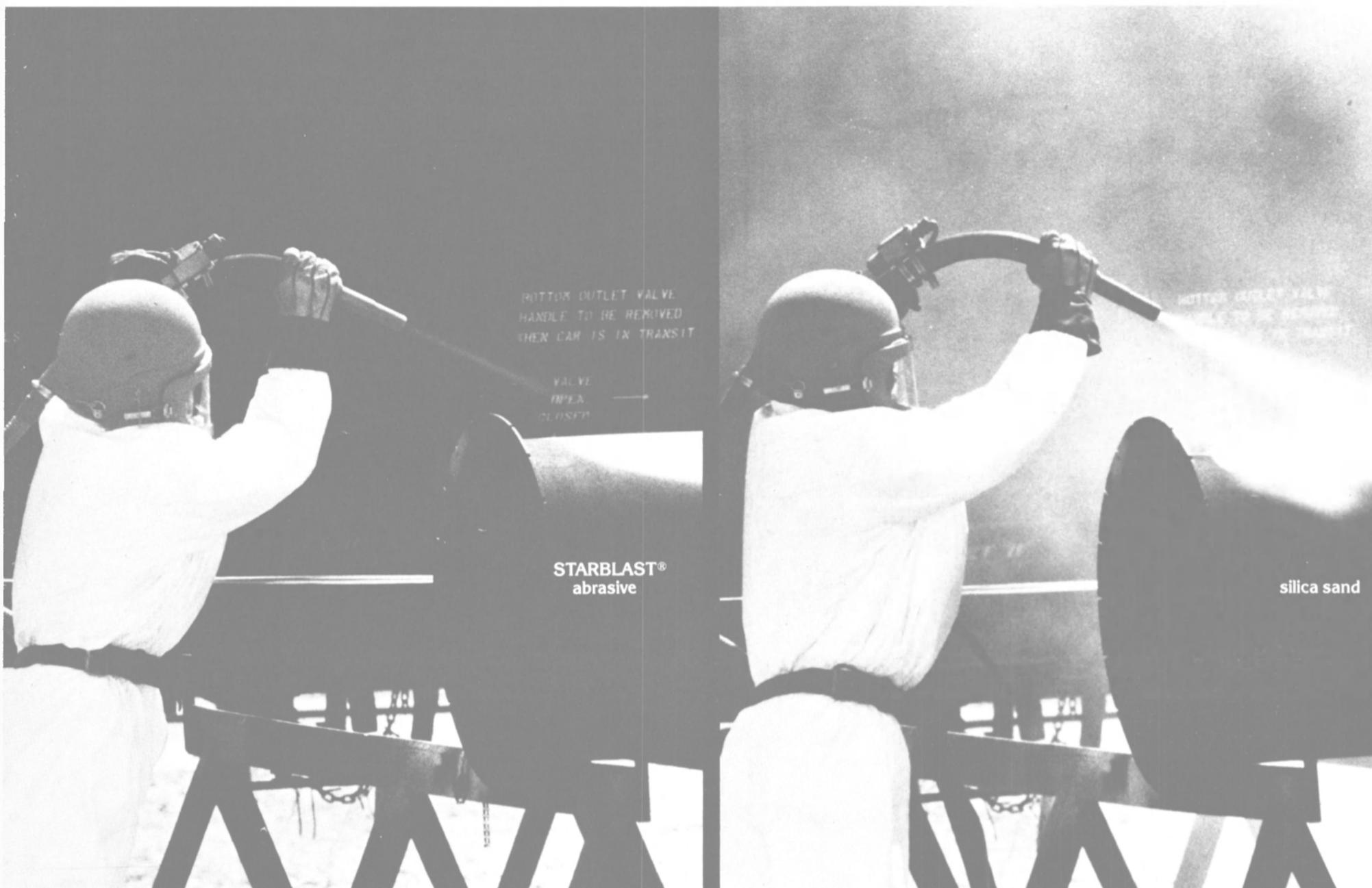
HYUNDAI
HEAVY INDUSTRIES CO., LTD.

1 CHEONHA DONG, ULSAN, KOREA TLX: K53615, K52221 TEL: (82) ULSAN (522) 43-5535 (Direct to sales manager)

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Circle 270 on Reader Service Card

STARBLAST®—up to 30 times less dust than OSHA standards permit!



Du Pont STARBLAST cleans faster, safer, more efficiently than silica sand—won't cloud work area.

Du Pont STARBLAST® abrasive permits virtually dust-free blasting. Airborne respirable dust and respirable free silica levels are up to a remarkable 25 to 30 times below applicable OSHA air contaminant standards.

Your blasting areas and adjacent work sites will be well below OSHA maximum respiratory exposure limits, with unobscured visibility. Operators can see their work clearly and can work faster with fewer interruptions.

Compared with silica sand, STARBLAST will greatly lessen the need for special ventilation and personal protection and will reduce concerns about the proximity of other workers to the blasting area.

STARBLAST cleans faster, cuts costs.

You'll quickly notice that STARBLAST cleans faster, because of its uniformly sized, dense, rounded grains—so labor

costs are lowered. It also handles the same amount of cleaning with less abrasive, reducing both cleanup and handling costs.

Call 800-341-4004 for more information.

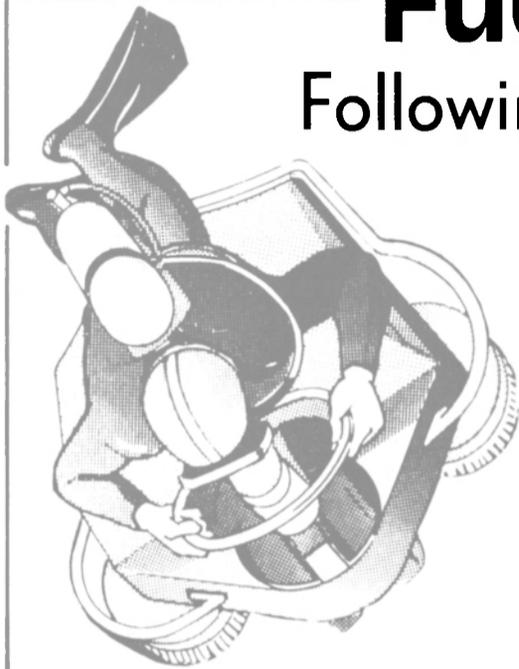
Du Pont STARBLAST offers low dusting and fast cleaning with safety, efficiency and cost savings. If you would like to learn more about STARBLAST, call us toll free for our literature package: 800-341-4004.



REG. U.S. PAT. & TM. OFF.

Fuel-saving

Following 23 years experience....



... in UNDERWATER CLEANING of ships, the PHOCEENNE SOUS-MARINE/PHOSMARINE EQUIPMENT group of companies now ranks first in the world for this technology.

Hydraulic PHOSMARINE equipment is used in 40 countries and the new semi-automatic package "BRUSH-KART", marketed since 1975, is used in 31 cleaning stations along the major sea lanes, and more BK stations are to come.

The quality of underwater cleaning obtained with BRUSH-KART is far better than anything also available, semi-automatic operation ensures a quality standard, nearing perfection, which BK offers alone.

A single diver can clean the VLCCs and ULCCs during very short calls, thanks to the velocity of operation.

Specially designed rotary brushes do not sever the coatings nor does BRUSH-KART deprive the weld beads of their protective coats.

Consequently, without any risk of corrosion—corrosion is highly expensive—ship's underwater parts can be maintained afloat during many years thanks to this technology. Brushing can be performed as often as is required to ensure economical trading without speed loss.

The current oil and hard cash savings' policy in most countries can only open attractive prospects to this technology, providing cleaning services are offered along the main sea routes throughout the world.

And this is a new target which PHOCEENNE SOUS-MARINE EQUIPMENT are concentrating upon currently.

Every "PHOSMARINE" equipment is manufactured in France only

PHOCEENNE SOUS-MARINE SERVICE PHOSMARINE EQUIPEMENT
 21, Bd DE PARIS, 13002 MARSEILLE (FRANCE) TELEX 401826 PHOSMAR

BRUSH KART HULL CLEANING STATIONS

GIBRALTAR GIBUNCO	Telex : 2281 GK	CHILE S.T.S. SERVICIOS DE TRABAJOS SUBMARINOS	Cable : STS Quintero
ITALY G.A.T. (c/o INBROK)	Telex : 270490 Inbrok	U.S.A. SEAWARD INC.	Telex : 899455 FSCH
NORWAY ARNULF L'ORSA A/S	Telex : 71187 Lorsa	U.S.A. UNIVERSAL MARINE	Telex : 182142 Unimar
BELGIUM N.V. HYDREX	Telex : 33735 Hydrex	U.S.A. INTERNATIONAL DIVING SERVICES	Telex : 664540 Seaserv
LAS PALMAS Gran Canaria		BAHAMAS MECHANICAL ENGINEERING, LTD.	Phone : (809) 352 5562 Freeport
CONSUBSA S.A. / MILLER Y CIA	Telex : 95353 - 95153 Midat	VENEZUELA CIA RAMREY INTERNACIONAL S.A.	Telex : 31173 Ramrey
GREECE PICCARD HELLAS DIVERS	Telex : 213073 Pica	NETH. ANTILLES (Curaçao)	
SINGAPORE SELCO (SINGAPORE) PTE	Telex : 21352 Selsing	DUTCH ANTILLAN SALVAGE & U/W CONTRACTORS	Telex : 1045 SIACU
JAPAN PHOSMARINE FAR EAST K.K.	Telex : 27274 Dynamic	CANADA B.C. ALL-SEA ENTERPRISES, LTD.	Telex : 04352841 Waterfront
JAPAN MARINE ENTERPRISE CO LTD.	Telex : 4424834 Namoto	U.S.S.R. MORFLOT DIVERS / BLACK SEA SHIPPING CO.	Telex : 143 Morflot OD
HONG KONG WILLIAMSON MARINE SERVICE	Telex : 64518 WMSHK	U.S.S.R. NOVOROSSIYSK SHIPPING CO.	Telex : 8216
KOREA KOREA PHOSMARINE CO LTD	Telex : 23231 MOCNDM (attn : KOPOMAR)	SOUTH AFRICA PHOSMARINE BRUSH-KART SOUTH AFRICA S.A. c/o GRINDROD	Telex : 622724 SA
AUSTRALIA FRANMARINE SERVICES (Wa) P/L	Telex : 93484 Fran AA	SAUDI ARABIA PHOSMARINE BRUSH-KART SAUDI ARABIA c/o Marsev.-U.I.S. Middle East Ltd.	Telex : 401138 AET SJ
DUBAI NICO INTERNATIONAL U.A.E.	Telex : 45961 Nico EM	NEW CALEDONIA PHOSMARINE BRUSH-KART NOUVELLE-CALEDONIE	Telex : 45 NM c/o Comin
DUBAI HYDROSPACE INTERNATIONAL	Telex : 47455 Hydro	FRANCE PHOCEENNE SOUS-MARINE / PHOSMARINE EQUIPEMENT S.A.	Telex : 401826 PHOSMAR
SHARIAH AL AREEN GENERAL TRADING EST.	Telex : 68703 Rest		
KUWAIT KUWAIT SHIPBUILDING & REPAIRYARD CO.	Telex : 2438 KSPRYD		
TURKEY ISIKLAR DENIZCILIK V/A TICARET	Telex : 22966 Isik		

Additional stations are planned

Marine Coatings Review — Clemco

(continued from page 30)

causing abrasive flow interference. The result is a hard-hitting, high-velocity blast force that will clean to white metal quickly.

A versatile function of the system is its ability to remove aged top layers of paint while retaining solid, tightly adhered base coats. This cost-effective feature eliminates the necessity to apply new primer when existing primer is intact.

Another new addition to the Clemco line, after two years of research and development and field testing, is the PVR-400 pinch valve remote control for abrasive blast cleaning. With this control, one operator can stop blasting without depressurizing the blast machine; other operators can continue to work off the same machine without interruption.

The PVR-400 features a normally closed grit valve and an air valve. Air pressure opens both to blast and a powerful spring closes them instantly when pressure is removed. Pilot valves or air pressure are unnecessary to close the valves. The danger of accidental blasting is said to be nonexistent.

The remote control systems are available in either pneumatic or electrical versions.

CONSOL

Circle 59 on Reader Service Card

M3 oil developed by Consol will restore the flexibility and resiliency of deteriorating wire rope with just one application.

Wire rope strands break as a result of undetected core rust, symptomized by loss of flexibility. M3 oil penetrates to the core, restores memory to the rope, and provides long life rust control. Consol Oil is available in three grades:

Grade M1 is for use where immediate protection and penetration are required. This product is recommended to free frozen fittings and remove soot scale on the fire side of boiler tubes.

Grade M3 affords slower penetration but gives longer lasting protection. Ten to 30 days are required to condition a surface. Since M3 will not gum up the moving parts, it provides an excellent protective treatment on anchor windlasses, deck winches, capstans, steering engines, and all other deck machinery.

Grade M4 is designed for maximum preservation with stop-corrosion action. Recommended for use in inaccessible areas such as winch platforms, chain lockers, floor plates, and the like, this product will also provide maximum protection and preservation

for spare parts and other marine equipment stored for extended periods.

Consol oil will not congeal and will not emulsify in water; it also exhibits extended life when exposed to the elements.

Consol Rust/Kill Systems are available from Contact Paint of Baltimore, Md.

DAMPNEY

Circle 32 on Reader Service Card

Dampney Company, Inc. of Everett, Mass., has been supplying its Apexior[®] line of protective coatings to the maritime industry for more than 70 years. Two grades of the Apexior coating offer long-

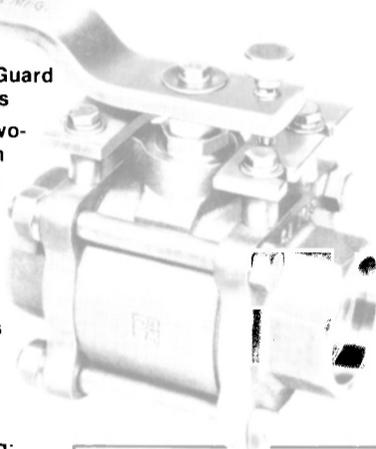
lasting corrosion protection for metal exposed to fresh or salt water over a wide range of temperatures.

Apexior Number 1[®] is a heat-resistant coating for metal surfaces immersed in boiling water at temperatures to 700 F. Typical applications include the water-side sur-
(continued on page 36)

SEA-GOING

Line of BALL VALVES

- Made to U.S. Coast Guard & Navy Specifications
- Complete range of two-way Bronze Valves in choice of alloys with any type of trim, including Monel
- Featuring sil-braze ends, Navy flanges, detenting handles, blow-out proof stems
- Shock & vibration tested
- Sizes: 1/4" thru 4"
- Pressures to 700 psig; temps to 450°F.
- Also available in Flush Tank, Multi-Port and Manifolder Valves



FREE CATALOG

Fully describes the line and includes Marine system applications. No obligation.

EST
1899

PB PITTSBURGH

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Circle 145 on Reader Service Card

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PMS has developed new, low-cost, fuel-saving services for all size ships.

UNDERWATER PROPELLER POLISHING

- Satin-smooth propeller surfaces
- Service to ship's schedule

PRE-DRYDOCK HULL SCRUBBING

- Underwater hydraulic cleaning
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- Underwater Repairs and Maintenance

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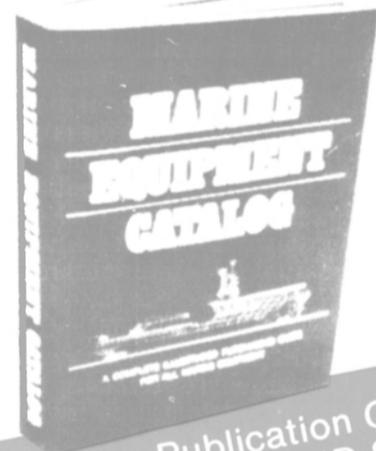


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Circle 157 on Reader Service Card

**ALMON JOHNSON
CONSTANT TENSION LST
STERN ANCHOR WINCHES
WITH ALL CONTROLS**



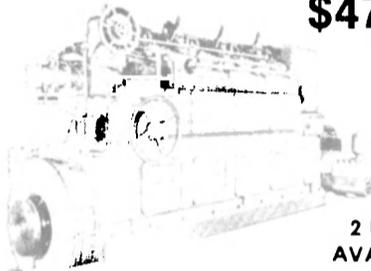
Drum capacity — 900 ft. of 1 5/8" wire. Gypsy performance — 12,000 lbs at 125 FPM. OAL 12' — CAW 10'11". Driven by 50 HP — 230 VDC — 181 amp motor. 2 available, with controls.

PERFORMANCE

	Max. Control	Auto. Tension Control	
Line Speed	100,000 lbs	26,000 lbs	3000 lbs
Line Tension	10 FPM	Stall	400 FPM

**NEW CLARK 500BHP DIESEL
4-CYL. — AIR STARTING**

\$4766



**2 UNITS
AVAILABLE**

500 BHP @ 400 RPM. 4-Cylinder straight inline type — 12 1/2" X 16" — 2-stroke single acting — liquid cooled — direct reversible — CW rotation. With standard shaft-connected starting air compressor. 46,000 lbs., net weight—228" long—98" wide—132" high. Designed for heavy duty, rugged use, its extreme simplicity will result in lower operating and maintenance costs.

**LOUIS-ALLIS M.G. SETS
2.5 KW 120 Volt Single Phase 60 Cycle Output
230 VOLT D.C. INPUT
1800 RPM
NEW - UNUSED EX - U.S.N.**

\$1566



2 1/2 KW—115 volts single phase A.C. output. GENERATOR: Type GNA—class 1G— 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).

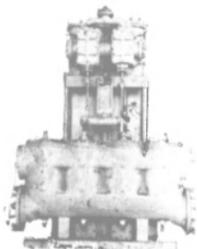
CAN FURNISH WITH 230 VOLT DC INPUT

**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**

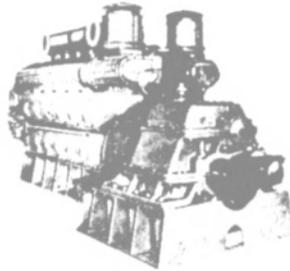


1400 GPM @ 110 PSI — suction lift 11.5 ft. — steam back pressure 15 lbs. 14" Suction—10" discharge — 2 1/2" steam — 4" exhaust. Overall width 6'8" — overall height 9'1 1/2" — depth 3'9 1/2". Wt. approx. 10,000 lbs

**RECONDITIONED 1980
ABS — READY TO GO**

**MATCHED PAIR 900HP GM 12-567A
DIESEL ENGINES**

**WITH FALK
REVERSE
AND
REDUCTION
GEAR**



ENGINE: GM 12-567A—8 1/2 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. — 5 1/2 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

**CLOSE
OUT!**
**CARGO PUMP
REDUCTION
GEARS**

\$2650



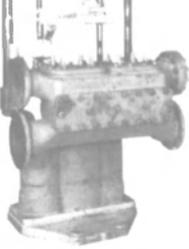
Type S-233 — form AE — 700 HP — 6002/1885 RPM — clockwise rotation facing input coupling. All Ex-Exxon valves when they re-piped from 16" to 20". All appear to be in good condition.

**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 A**



**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**



**TAI
EXPANSI**

36" Diameter — 2 drop-bolts. Drawing



CARGO

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



QUICK-OPEN

Handwheel top & b
24" with 5" coamin



**QUICK-
LEVER O
26" ;
WATER
DO**



**UNUSED E-125
WESTINGHOUSE
CARGO PUMP
TURBINE
ROTORS**

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

**\$4450
EACH
3 AVAILABLE**



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ND DOORS IN STOCK
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REG. PRICE
\$425
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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. Bosmet #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.



**NEW 18" & 24"
HATCH COVERS**

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

**KER
IN TRUNK**

Coaming - 7-Dog
#36/26



HATCHES

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



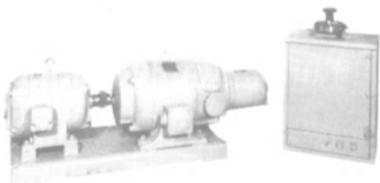
NG HATCH

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



**CTING
ERATED
66"
IGHT
RS**

**5 KVA
MASTER M.G. SET**

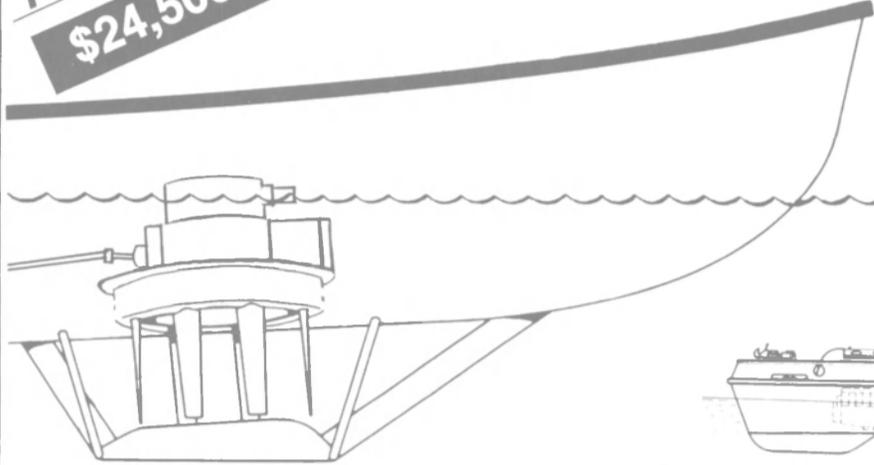


Input 5 H.P. - 120 volts DC - 1800 RPM. Output 5 KVA - 120/1/60 - 1800 RPM.

**PRICED
TO SELL!
\$24,500**

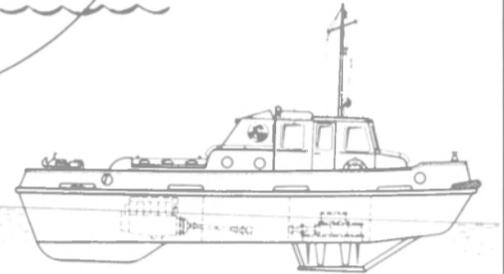
**TWO
1000 HP**

**VOITH-SCHNEIDER
CYCLOIDAL CONTRA-ROTATING
OMNI-DIRECTIONAL PROPELLERS**



**GREAT
MANEUVERABILITY**

**UNMATCHED
RESPONSE**

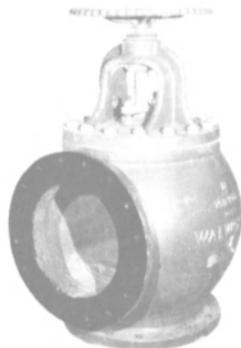


Serial Nos. NR-1783 and NR-1784. Unit size 24/E150. 6 Stainless steel blades each unit - 1500mm blade length - 2400mm blade orbit diameter. PRESENT DRIVE with Voith AD40 reduction gears & heavy duty motor 800/1000 HP - 440/3/60 - 1775 RPM - squirrel cage - 884 amps - frame 23153, Mfg. by Electric Machinery 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.**

**VALVE
SALE!**

**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
12" - \$349
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

**SPECIAL!
10%
OFF
ON 6 OR
MORE
VALVES**

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

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

900 LB. HIGH PRESSURE VALVES

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

METALS CO.

BALTIMORE, MD. 21202

1900 Marine Dept.: (301) 752-1077

AD. U.S.A.

TWX 710-234-1637

SURPLUS BALANCED HEAD FAIRLEADS



PRICES

3/4" BM-10 - \$1399
1" BM-12 - \$1499
1 1/4" BM-14 - \$1599

MODEL NUMBER	LINE SIZE	SHEAVE DIAM.	SHANK OPENING	BASE LENGTH	BASE WIDTH
BM-10	3/4"	10"	4.76"	16.5"	22"
BM-12	1"	12"	5"	24"	28"
BM-14	1 1/4"	14"	5"	28.3"	31.9"

Marine Coatings Review
— Dampney

(continued from page 33)

faces of such marine equipment as steam generator boilers and drums, economizers, water heaters, evaporators, and steam turbine rotors. It is applied by brush and dries tack-free in 16 hours.

Apexior Number 3[®] offers low-cost basic corrosion protection for difficult-to-prepare metal surfaces

that are frequently wet or immersed in water at temperatures up to 140 F. It is recommended for service conditions where the use of expensive high-performance coatings cannot be justified.

Typical applications include condensers, air receiver tanks, brine tanks, rudders and rudder posts, propeller blades and cones, and chain lockers. Apexior Number 3 can be applied by spraying or brushing; drying time between coats is 12 hours.

DEVOE PRUFCOAT

Circle 33 on Reader Service Card

Devoe Prufcoat of Baton Rouge, La., a major producer of protective coatings and linings for industry, recently introduced its Chemline[®] 546 WB, a high-performance, two-coat, water-based epoxy system to provide superior protection for tank linings. The new product may also be used for steel and masonry

structures, and for plant and mill equipment.

According to **Andy House**, national sales manager, Chemline 546 WB offers excellent chemical resistance, high solids, low V.O.C., fast water insensitivity, and may be applied over clean, sound old paint without involved preparation.

Devoe Prufcoat is a division of Grow Group, Inc., one of the leading U.S. producers of specialty chemicals and paint.

DREW AMEROID

Circle 34 on Reader Service Card

Drew Ameroid Marine of Boonton, N.J., has introduced a non-corrosive marine cleaner designed for engine cooling systems, which, unlike other products available in the industry, performs three key tasks in one step. The new one-step cleaner removes oxides and other minerals and light oils, much like an acid, but without the need for pretreatment solvents, to remove oils, or neutralizers, to prevent flash rusting.

In addition to cleaning recirculating water systems, Ameroid one-step cleaner is suitable for parts such as exhaust valves, turbocharger parts, heat exchangers, piping, rotors, and filters. It is also an effective brightener for aluminum, brass, and copper.

The water-soluble cleaner works to clean surfaces by penetrating quickly to remove exhaust carbon, oils, mineral scales, and the oxide layer itself. Dispersants in the product help to prevent redeposits on the cleaned surfaces.

The cleaner may be applied by one of a number of methods, including dip or hot tank soaking, recirculation, spray/high-pressure washing, steam lancing, power washer cabinets, and foam methods. Economically concentrated, it performs consistently in a 20-percent solution at temperatures of 140–180 F. It may also be used at ambient, but longer cleaning time is required.

A very slightly contaminated engine water system or chilled water system may use a lower concentration of the new Ameroid one-step as a system flush. Heavily rusted systems may require several cleanings at elevated temperatures with good agitation to achieve the desired results.

DUPONT STARBLAST

Circle 58 on Reader Service Card

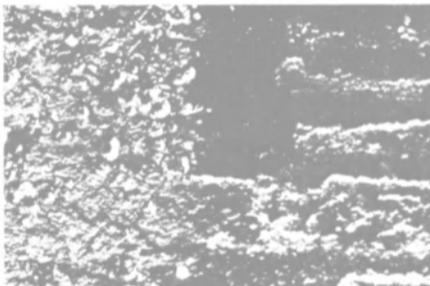
DuPont "Starblast" of Wilmington, Del., markets an abrasive that is a blend of coarse and fine grains of staurolite mined from DuPont's heavy mineral deposit located in Starke, Fla.

Repeated demonstrations confirm that a ton of "Starblast" will clean three times as many square feet of metal surface as

Tests prove water blasting at 20,000 PSI removes subsurface corrosion cells.



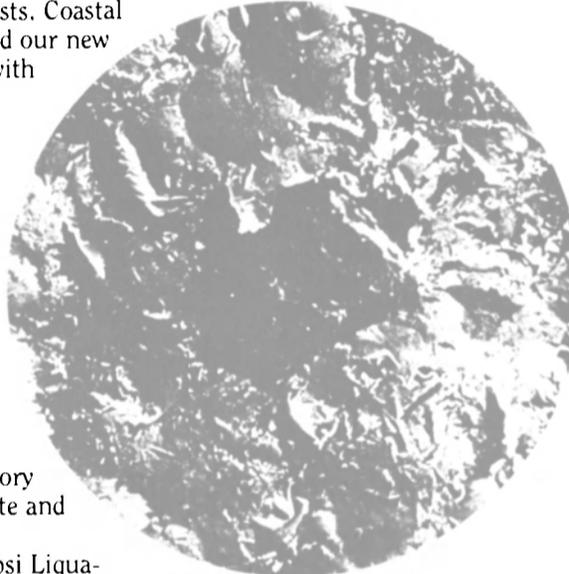
Barnacles and marine growth can be easily cleaned with 20,000 psi on land or by using a zero thrust gun underwater.



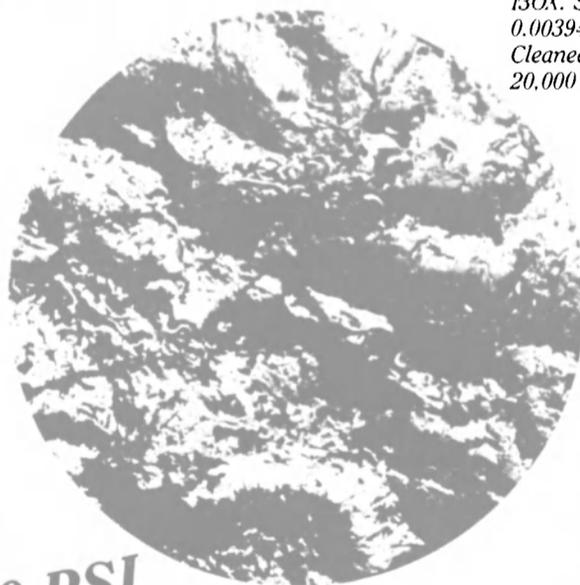
In independent field tests, Coastal Science Associates compared our new 20,000 psi Liqua-Blaster[®] with abrasive blasted surfaces – which often cause coating failures. They reported, "At 20,000 psi, we got to white metal... clean of hidden corrosion cells that interfere with paint life."

Our 20,000 psi Liqua-Blaster safely allows one operator to remove deposits that can't be removed with abrasive blasting. Including older salt-rusted steel surfaces, paint, refractory build-up, concrete, aggregate and marine growth.

Challenge the 20,000 psi Liqua-Blaster. Call or write for complete test results.



100X. Surface view. 0.00394 inch (.1mm). Sand blasted. Note corrosion cell.



130X. Surface view. 0.00394 inch (.1mm). Cleaned with 20,000 PSI water blast.



Rusted surfaces are cleaned to "near white" metal.



Get longer coating life with 20,000 PSI

BUTTERWORTH[®]

Butterworth Inc., 3721 Lapas Drive, P.O. Box 18312, Houston, TX 77223 USA. Phone: 713-644-3636 or 1-800-231-3628. Telex: 775112 EXXON USAB. Affiliates of Exxon Corporation.

© 1984, Butterworth, Inc. The "Butterworth" emblem and "LIQUA-BLASTER" are registered trademarks of BUTTERWORTH, INC.

a ton of coal slag or silica sand. Calculated another way, "Starblast" will clean 100 square feet of metal in two-thirds the time needed by the other two blasting materials. This translates into a labor saving for the shipyard.

Another plus factor is that nozzle life has been extended significantly since the switch to the less abusive "Starblast." A final plus in the "Starblast" column comes in the "dusting" comparison. Silica sand and slag generate clouds of dust that are troublesome from both an environmental and a visibility standpoint. By creating less dust, a blaster using "Starblast" can see the metal more clearly and, as a result, work more quickly.

Added up, all the advantages of "Starblast" include uniform blast pattern and profile, faster cleaning rate, lower equipment maintenance record, reduced labor investment and less dusting.

ENGELHARD

Circle 36 on Reader Service Card

Engelhard Corporation's Capac™ impressed-current cathodic protection systems have proven effective in the prevention of corrosion and pitting in well over 2,000 ocean-going vessels of all sizes and types—tankers, containerships, workboats, mobile offshore drilling rigs, fishing trawlers, tugboats, and many types of naval vessels.

Manufactured by Engelhard's Systems Department, the automatically controlled Capac systems have operated successfully for 20 years and more, the life of most marine vessels. Thousands of dollars can be saved by avoiding the need for replacing sacrificial anodes at each drydocking and by extending the time between each drydocking.

Designed to operate unattended in the automatic mode, Capac systems constantly adjust the impressed current emitted by the platinum-clad niobium anodes to account for changes in hull speed, water temperature, salinity, and loss of the protective coating. Hull conditions can be estimated by monitoring current output—a major increase in current demand at sea probably means that serious deterioration of paint on the hull has occurred, and allows corrective action to be planned in an economical way.

Capac systems are simple to operate. No special training is required for the routine maintenance that leads to years of trouble-free corrosion control.

Engelhard Corporation, headquartered in Edison, N.J., is an international leader in the technological development and manufacturing of high-perform-

ance specialty chemicals and catalysts, industrial minerals, and precious metals products.

ESGARD

Circle 37 on Reader Service Card

Esgard, Inc. of Lafayette, La., manufactures bio-compatible, vegetable-based corrosion coatings, Bio-Gel and Bio-Float, which are

said to offer long life and economical, durable protection of wet and dry internal areas in all types of marine vessels. Common features of the Bio products include: absence of solvents or petroleum products, 450 F flashpoint, non-flammability, and resistance to a wide range of acids, alcohols, and hydrocarbons.

Bio-Gel provides long-term protection in areas of minimum sur-

face preparation where a gel type coating is preferred. In addition to film thickness, it protects via rust inhibitors and an ability to "skin over," a natural occurrence that requires no ventilation. The initial skin forms between six and 10 days after application. Film thickness is left to the customer's discretion, with the manufacturer's recommendations being 6-40 mils.

(continued on page 38)

Oil/Water Separator

NEWS

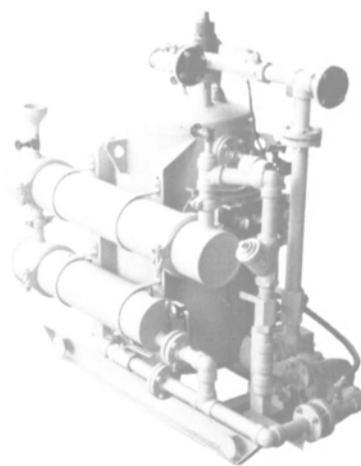
ST. LOUIS, MISSOURI

MAY, 1984

New PACE System Breaks Emulsions Leaves no detectable oil in effluent, according to IMO and USCG Tests

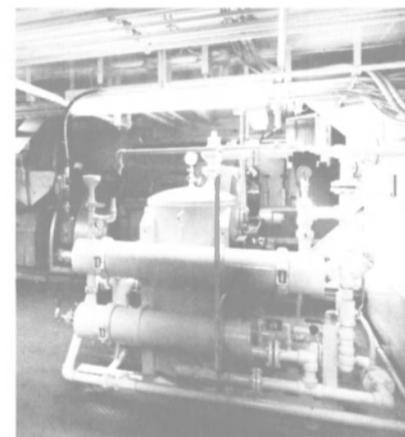
The PACE™ Oil/Water Separator will handle virtually any combination of fresh water, salt water, free oil, mechanically induced emulsions and detergent induced emulsions. It will recover the oil broken out of emulsions and discharge oil-free water. The system is fail safe. Its ability to discharge clean, oil-free water does not depend on operator skill. There are no adjustments. Handles up to No. 5 heavy fuel oil without modifications. If the oil will flow, PACE can process it. Our long experience in sophisticated process technology has produced this simple and rugged PACE equipment. The only moving parts are two solenoid valves and a centrifugal pump. A true advancement in oil/water separa-

tion technology, the complete line of PACE™ (Positive Accelerated Coalescence of Emulsions) systems is certified by the U.S. Coast Guard per IMO Resolution A. 393(X) and 46 CFR 162.050 for installation aboard inspected vessels.



Pace Systems can be sized to accommodate any type or size vessel from small workboat to ocean liner.

New, compact unit, from the makers of FAST Marine Sewage Systems is fully automatic, self-priming, "hands-off" Oil/Water Separator System. No chemical additives are required. No filters are required.



The Pace system shown is currently in operation aboard the M/V Dave Carlton, operated by Heartland Transportation Company.

The PACE system is completely self-contained and there are no hidden extras.

pace

For Information, call or write today.

 **MARINE SYSTEMS**
DIVISION OF ST. LOUIS SHIP
611 E MARCEAU ST ST LOUIS MO 63111 USA
(314) 638 4000/TELEX 44 7224/ST L SHIP ST L
Division of Pott Industries Inc. An HNG Company

Marine Coatings Review — Esgard

(continued from page 37)

Bio-Gel can be applied over firm, damp surfaces. Application is by airless spray methods, with coverage ranging from 40–200 square feet per gallon. Manual methods or hydroblasting are the best types

of surface preparation. The coating's yellow color makes application and inspection easier.

Bio-Float is introduced as an alternative to petroleum-based "floatcoat" products. Bio-Float may be either floated on or sprayed. It does not readily skin. While providing superior protection, it possesses excellent penetrating properties and can be used to prepare

surfaces for more permanent type coatings.

Bio-Gel and Bio-Float represent only two of the protective, rust-inhibitive coatings available from Esgard. Other products include self-priming enamels, wire rope and cable lubricants, removable inventory storage coatings, flange protection systems, and long-term tubular coatings.

EUREKA CHEMICAL

Circle 38 on Reader Service Card

Eureka Chemical Company of South San Francisco has been a leader in supplying quality soft coatings for the marine and offshore industries. Fluid Film™, Gel BW, for years has been used in ballast tanks to provide long-term protection at the lowest practical cost per year. Fluid Film Liquid AR, a new product, can be used where spray application of Gel BW is not practical. This new product can be hosed onto metal surfaces in ballast tanks or void areas with an absolute minimum of surface preparation, both for corrosion control and to soften heavy scale prior to descaling operations.

Following company policy of developing corrosion control for an expanding number of areas aboard ship, other new Eureka products continue to supplement ballast tank protection.

Fluid Film WRN-EP may be applied to standing or running rigging for both corrosion protection and lubrication. EP properties enhance its lubricating quality. For users of pressurized wire rope lubrication equipment such as Dyna-Lube, Fluid Film WRL penetrates to the core of the wire rope without dripping as the rope emerges from the applicator.

Fluid Film aerosols, which contain no solvent and do not dry out, are convenient for small applications where penetration and lubrication are desired.

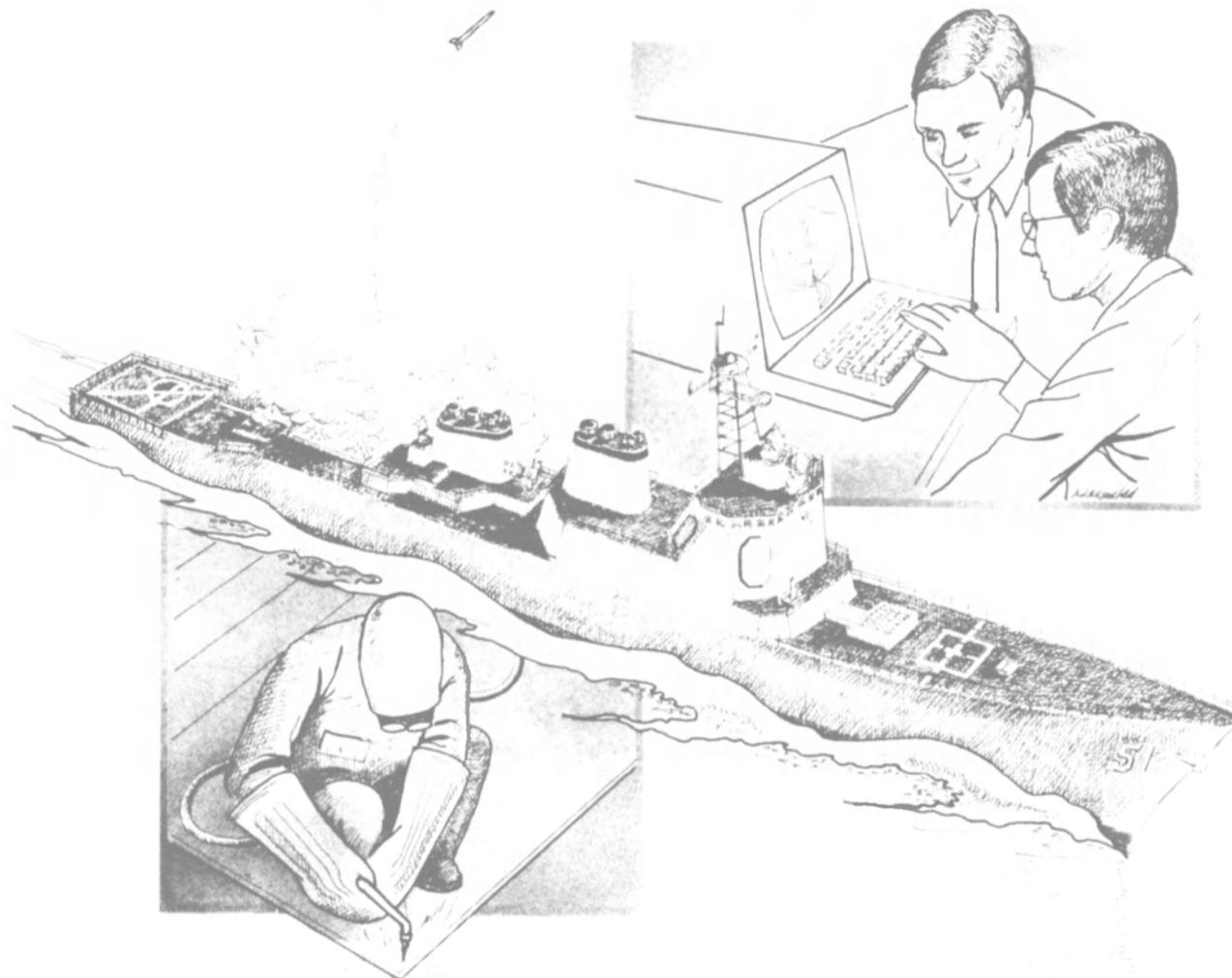
Eureka's Perma Film™ family of epoxies supplement the Fluid Film coatings. Perma Film WT-100 has been in use in potable water tanks for almost 20 years. Perma Film BT-200, for ballast tanks, does not require sandblasting but may be used over a surface conforming to SSPC-SP3. Perma Film PT-100 is the latest addition to the family, and is formulated for cargo tanks, particularly in tankers and bulk carriers.

GLIDDEN

Circle 39 on Reader Service Card

Glidden Marine Coatings of Harahan, La., has nearly 20 years of experience with a steel hull bottom system combining a thin-film barrier coat with an ablative, self-cleaning vinyl antifoulant. Normal performance of this system when properly applied is 4–6 years before spot blasting and coating repairs are required. Shipyards have complained that 6- and 8-year-old Glidden bottoms were difficult to blast to white metal as the old coating was still adhering tightly.

The Glidden bottom system has proven especially effective on vessels working overseas. An owner



Todd shipbuilders - an irreplaceable resource

Todd's shipbuilders realize they have a highly responsible job: building and repairing the naval and commercial ships so necessary for national security and the transport of vital materials.

Our skilled craftsmen are delivering the guided missile frigates (FFGs), under construction for the U. S. Navy, on time and on or under budget. We look forward to being afforded the opportunity to participate in the construction of the Aegis-equipped Arleigh Burke class (DDG-51) guided missile destroyers to continue this outstanding performance.

Todd has invested much of its profits in facility improvements, including new dry docks at Galveston, New Orleans and Seattle; piers, cranes, CAD/CAM computer technology, robotics and the acquisition of an entire shipyard in San Francisco, with a 65,000 long ton capacity dry dock. At Los

Angeles, we are constructing a ship lift and land transfer facility, to be operable the early part of 1984. When completed, this system will be capable of handling five ships simultaneously.

We have the equipment, know-how and expert craftsmen, at all of our five shipyards, to provide rapid, high quality and cost efficient workmanship. Give us the job and we'll deliver.



Todd Shipyards Corporation
One State Street Plaza, New York, N.Y. 10004

**DELIVERING THE SHIPS THE U.S. NEEDS —
WHEN IT NEEDS THEM.**

can confidently schedule two-, four-, and even six-year drydockings without bottom paint repairs being necessary except for major collision or catastrophic grounding damage. Of course, no matter where a vessel works there is significant savings in knowing that no blasting or painting needs to be done on the bottom until its sixth or eighth year of service.

Glidden's vinyl antifoulant allows little or no tightly adhering growth, even in badly polluted waters, and the system is resistant to delamination and to abrasion from repeated groundings on shallow bottoms. When repairs are required, turnabout is very quick. Under normal conditions, total drying time for a four-coat system is eight hours. The vessel may then be launched immediately or left dry indefinitely with no reduction of antifouling protection.

HEMPEL'S

Circle 40 on Reader Service Card

Hempel's Marine Paints A/S, with headquarters in Denmark and 26 factories worldwide, recently announced a new approach to non-polishing antifouling—a product area many sources estimate accounts for some 85 percent of the total world market for antifouling coatings.

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

The Classic line consists of four products: antifouling 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 vessel.

HENKEL

Circle 41 on Reader Service Card

Henkel Corporation of Minneapolis provides Versamid® 280B75 polyamide resin and Genamid® 2000 amidoamine resin, the curing agents used by formulators to produce unique epoxy coating that meets the U.S. Navy's P-24441 (SHIPS) Specification and offers good adhesion to poorly prepared

surfaces, low-temperature cure, and corrosion resistance without rust-inhibitive pigments.

Laboratory tests conducted by Henkel reveal that coatings based on these resins "creep" into small cracks to displace water and foreign materials. There is also chemical absorption on metal surfaces to prevent corrosion, and no zinc pigments to inhibit welding.

INTERNATIONAL

Circle 42 on Reader Service Card

Replacing International Paint's Intersmooth SPC range, HISOL is the latest development of this tried and true SPC, being exactly the same as Intersmooth when dry, the only difference being in the product application. A prime fea-

ture in the engineering of this new coating is its greatly increased volume solids and its ability to be applied in a range of dry film thicknesses. For a typical paint scheme, fewer coats are now required. Higher solids mean more square feet per gallon, less solvent in the air, and up to 30 percent savings in application and less

(continued on page 40)



With Magnakote, Magnus Maritec's Cost-Effective Tank Coating Formula.

Magnakote is the most economical soft chemical coating compound on the market: less than 3¢ per sq. ft.! No other soft coating gets near it for cost-effective tank & void space corrosion protection.

Magnakote is formulated for efficiency—no special surface preparation required prior to application (spray or float method).

A pioneering product of advanced, soft chemical coating technology, Magnakote is extremely durable. Thus, maintenance and repair costs are reduced significantly.

Spot repairs are easy. And, Magnakote removes quickly for overhauling. It's non-toxic, with a high flashpoint (320°F/160°C).

Magnakote—efficient, cost-cutting corrosion protection.

Magnus Maritec International, with 25 years of reliable service to the marine industry, offers a complete line of Continuous-Maintenance products and services.

For a copy of our technical literature contact your local Magnus Maritec representative or our world headquarters.



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Marine Coatings Review — International

(continued from page 39)

time in drydock. HISOL is totally compatible with existing Intersmooth SPC systems.

The new coating is available in two forms: HISOL 200 series is a slow-polishing, smoothing copoly-

mer recommended for application to all vessels over 15,000 dwt, and those operating permanently in warm waters. HISOL 900 series is a faster-polishing, smoothing copolymer than the 200 series, designed for vessels under 15,000 dwt, or low-activity vessels operating permanently in a severe fouling environment. It is particularly suited to vessels entering lay-up, allowing them to re-enter

service without the need for substantial hull cleaning either afloat or in drydock.

The second antifouling introduced, Interswift, is an eroding, polishing copolymer that fills the performance gap between traditional antifoulings and HISOL. Interswift, which supersedes Interspeed Special, achieves up to 50 percent savings in application costs, as one coat is used instead of two.

When applied over approved substrates, a single 6-mil coat will give in-service protection for 24 months.

Such a specification costs little more than a two-coat traditional high-performance antifouling scheme when the reduction in labor costs are accounted for. Alternatively, two coats of 4 mils each will protect the underwater hull for 30 months.

A third new product range has been introduced, Intershield EG series, abrasion-resistant coatings. Intershield has been engineered to reduce removal of the anticorrosive coating, which is the major cause of corrosion. Feedback from a large number of shipowners indicated that once mechanical damage exceeds three percent scattered over a given area, it is considered a serious problem requiring extensive and costly repair.

With twice the impact resistance and two to three times the resistance to erosive wear, Intershield's benefits include: reduced maintenance costs through improved protection against mechanical damage and reduced corrosion; improved cosmetic appearance; and minimization of mechanical damage sustained by the underwater hull, contributing to a smooth hull and fuel savings when used with Intersmooth HISOL.

International Paint has introduced these three new product lines as part of an ongoing worldwide program to offer shipowners cost-effective, high-performance marine coatings that will save time and money in both services and at drydock intervals.

JAEGLER PAINT

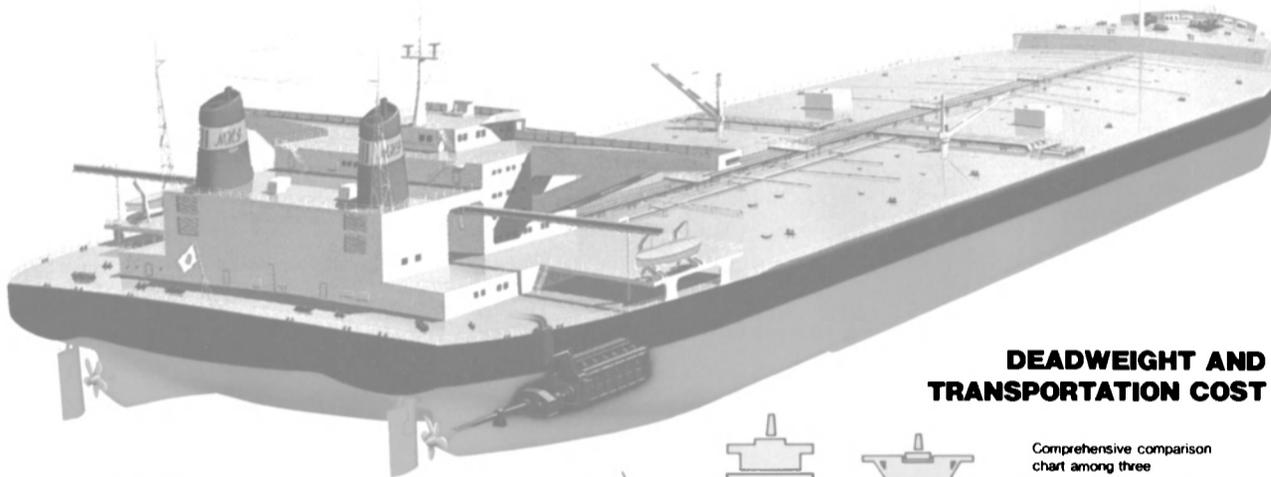
Circle 43 on Reader Service Card

Self-healing Cortec® finishes manufactured by Jaegle Paint Company of Havertown, Pa., are attractively colored coatings designed to obtain excellent durability when exposed to highly corrosive atmospheres and weathering conditions. Typical applications include: container rust prevention; various marine applications, including fresh and salt water ballast tanks, chain lockers, voids, and cofferdams; protection of overseas shipments; offshore drilling rigs; and many others.

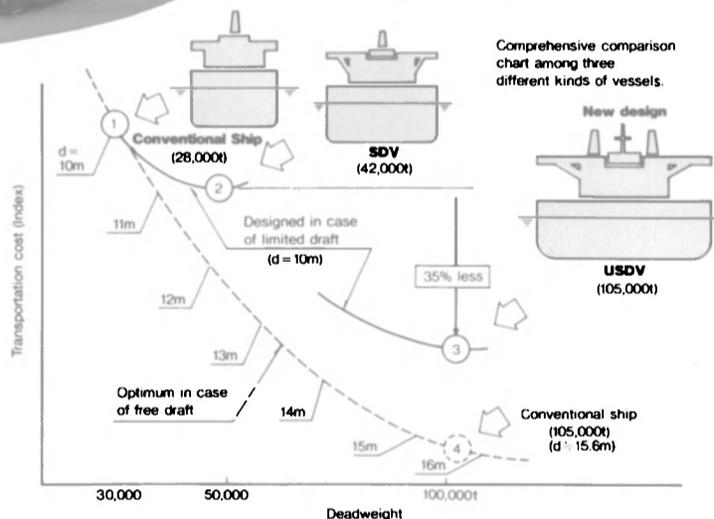
These finishes are a specially blended formulation of an inorganic-organic complex that obtains its unique, virtually impenetrable moisture barrier by formulation of highly polarized microscopic platelets lying parallel to the coated surface. This multi-layered effect, when combined with other highly resistant components included in Cortec finishes, results in one of the most durable coatings of its type currently in the field.

These products are not lanolin-

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USDVs are applicable for all types of vessels intended for service between shallow ports. Plant transport ships, tankers, bulk carriers, chemical carriers, RO/RO ships, container vessels, and liquefied gas carriers, are just some of the possibilities.



14,209 GT module carrier "SNIMOS ACE"

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San Francisco Office: 50 California St., Suite 3065, San Francisco, CA 94111, U.S.A. Phone: (415) 398-6654
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based, require virtually no surface preparation, and actually penetrate the substrate for maximum protection. They do not sag as do many products, can be applied uniformly, and can be manufactured to dry hard, remain tacky, or to remain soft.

A.B. Ferryl products are now available in the U.S. and Caribbean area through Jaegle Paint. Ferryl's Ferrycid is a complex chemical liquid that works quickly to prolong the life of paint, remove rust stains from painted surfaces, cleans and bleaches wood decks, and removes chalk, stains, and rust from sanitary installations. It penetrates into steel surfaces and provides a rust-free, clean surface, improving adhesion of the coating with corresponding improvements in protection and durability.

Ferryl 202 is a specially manufactured anticorrosive grease that provides a semi-dry, tough film with excellent lubricating, rust-prevention, and adhesion properties. This product is easy to apply and has a very high melting point to eliminate grease "drips."

JOTUN

Circle 44 on Reader Service Card

Jotun Marine Coatings, Inc. of Baltimore, an industry leader in self-polishing copolymer antifouling since the introduction of Takata LLL more than six years ago, now presents the next generation—Seaflex, Seamate HB33, and Seamate HB66.

Seaflex offers the flexibility of being applied in one coat on any previous traditional long life or self-polishing antifouling. It gives 24 months of protection in one coat. Seaflex contains Jotun-developed copolymer as binder. When drydocking time is limited, Seaflex offers an economical alternative.

Seamate HB (high build) is based on a specially formulated organotin copolymer as binder, which slowly dissolves in seawater so that fresh antifouling is continuously exposed. It can be applied as one coat up to a dry film thickness of 150 microns. It is available in two qualities, HB33 and HB66; the former polishes at a slower rate than HB66. Greater economy is achieved through the high-build nature of these coatings, as greater film thicknesses may be obtained with less costs.

As every shipowner realizes the importance of controlled fuel consumption, the new Seamate HB concept offers the owner the best and most economical system in relation to vessel speed, charter routes, and drydocking intervals.

In addition to the latest in copolymer antifouling, Jotun now offers Safeguard, a two-pack, corrosion-preventing, coal tar epoxy paint for long-time protection of submerged steel and ballast water tanks. Safeguard is said to be an

excellent choice where high-build, dry film thickness is required in a minimum of coats. It provides adequate corrosion control whether applied on tugs, barges, or ocean-going vessels.

KAISER CHEMICALS

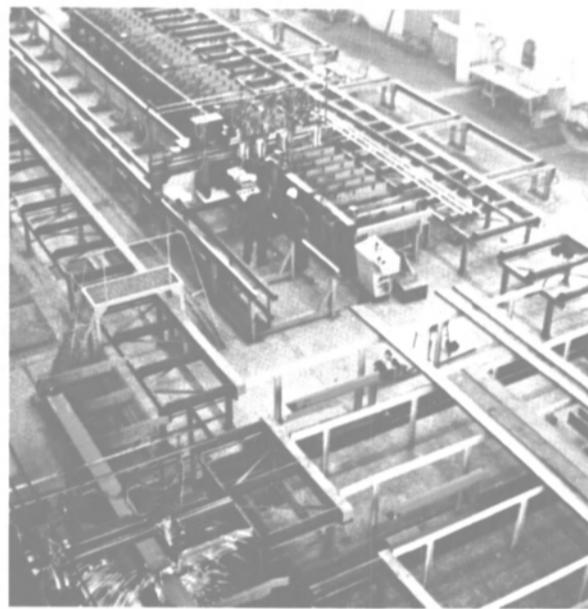
Circle 45 on Reader Service Card

Kaiser Aluminum & Chemical Corporation of Oakland, Calif., is

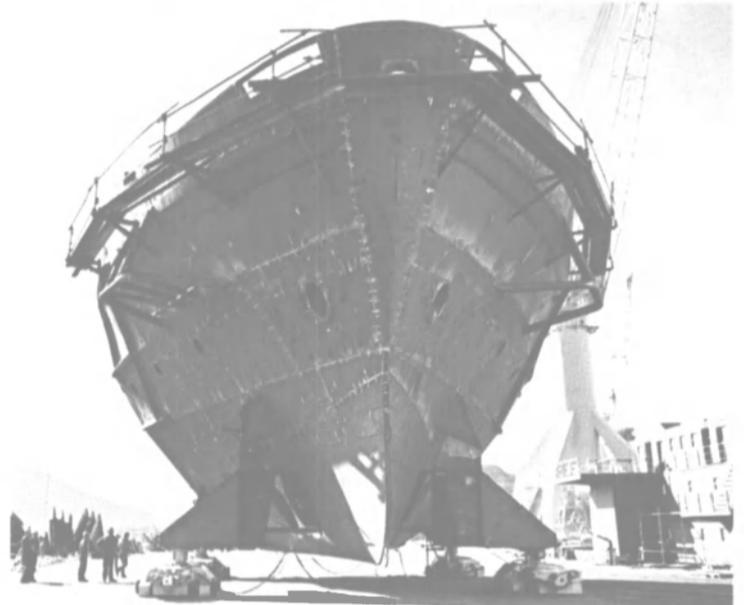
now manufacturing and marketing, in Asia and Oceania, aluminum anodes for cathodic protection in marine environments. The anodes are being produced in Taiwan by the Metal Products Division of Kaiser Chemicals, a division of Kaiser Aluminum. Kaiser Chemicals has been a major supplier of sacrificial anodes for the protection of steel in corrosive environments for 30 years.

Primary product for marine applications is KA95, a highly efficient, mercury-type aluminum alloy anode, with maximum current output. The company's Far East converter, Formosa Shinn Yaun at Kaoshiung, Taiwan, will produce flush-mount hull anodes, ballast tank anodes, platform, and multi-purpose anodes. Kaiser Chemicals maintains the same manufacturing (continued on page 42)

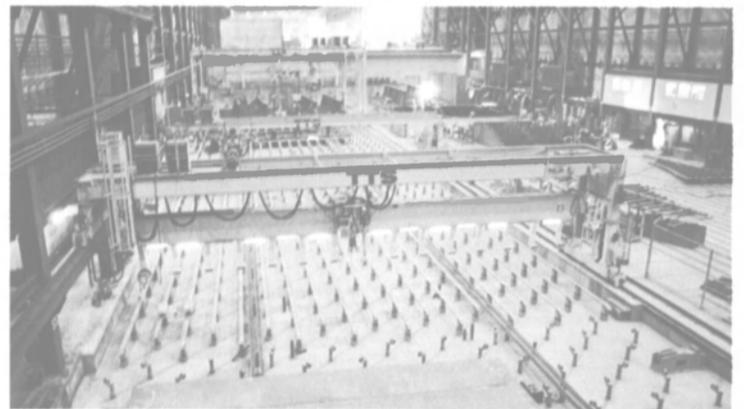
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DWB ship transfer system.



Panel line at Bath Iron Works.

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Marine Coatings Review — Kaiser

(continued from page 41)

ing techniques and stringent quality-control measures at its new facility as it established at its modern, 12-million-pound-capacity manufacturing facility in Tulsa, Okla.

Since its start-up in the fall of 1983, the new Taiwan operation has already received orders for

more than two million pounds of cast aluminum, including large orders from Daewoo Shipbuilding in Korea and Nippon Steel in Japan.

MAGNUS MARITEC

Circle 46 on Reader Service Card

Magnus Maritec International Inc. (MMI) of Palisades Park, N.J., has two major corrosion-control products—Magnakote® and Pro-tecsol-100.

Magnakote is a rust-retarding tank coating that is an inorganic-organic complex with a platelet crystalline structure similar to fish scales. These platelets are polar in nature and form a dense, tight coating that provides an effective corrosion barrier by allowing a low rate of vapor transmission. This coating is thermally stable and has a low odor. It is non-toxic in use and has a high flash point (325 F) for safety in application. It does

not contain any ingredients that require special clothing or breathing apparatus for entry into the tank.

Magnakote has been tested in accordance with U.S. Mil-spec Mil-R-21006 (Ships) and it surpassed other products in immersion test, salt-spray test, and stability. Spraying is the preferred method of application and requires the least amount of material. Application by the flotation method should only be used when the geometry of the tank precludes spraying. Magnakote should not be applied by roller or brush as these methods disturb the uniformity of the platelet formation.

MMI's Pro-tecsol-100 is a liquid blend of organic and inorganic corrosion inhibitors specifically developed for the protection of ballast tanks filled, during lay-up, with sea or brackish water. It forms an adherent passivating film on tank surfaces that protects the steel from corrosion. This protective film is maintained on reballasting by subsequent minimal additions (50 ppm by weight). Exposure of steel to Pro-tecsol-100 solution provides protection that remains even after the inhibited solution is replaced by uninhibited water.

The preferred method of treating salt water with Pro-tecsol-100 is proportional metering during ballasting. An alternate approach is to pour a 55-gallon drum into the ballast tank for each 3,000 tons of ballasted salt water by controlled pour to achieve as close to proportional mixing as possible.

Pro-tecsol-100 may also be used to provide an effective, economical solution to the corrosion problems found in cofferdams, bilges, voids, barges, and pipelines.

MUHLHAN GROUP

Circle 47 on Reader Service Card

The Muhlhan Group of companies of Hamburg, West Germany, a worldwide corrosion-protection organization for shipping and industry, recently announced the appointment of Field, Wigham & Company of Great Neck, N.Y., as its sales representative for the U.S. President of the firm is Sheldon B. Field.

Muhlhan specializes in steel and concrete protection work, such as high-performance tank, hull, and repair coating at shipyards, and shoreside coating work for oil refineries, conventional and nuclear power stations, and chemical plants. The Group is presently active in 17 countries on four continents.

Apart from the flexibility and mobility of its work force, Muhlhan operates the shot-blasting vessel Strahl-O-Matic, which is capable of performing work directly alongside a vessel at any site.

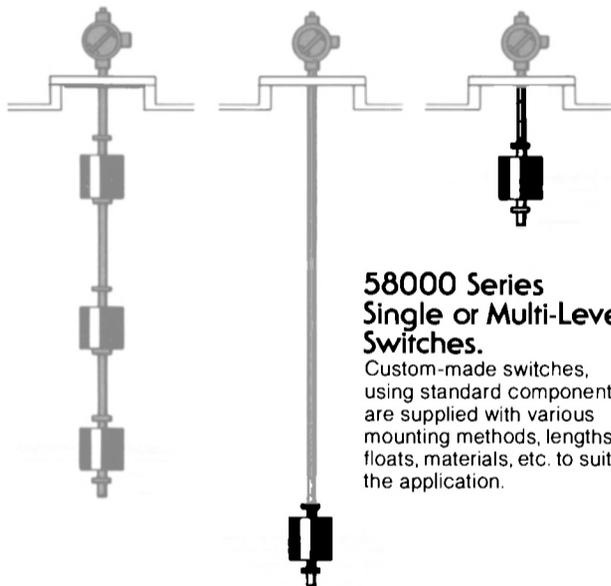
Muhlhan is presently recycling abrasive material in compliance

(continued on page 44)

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There's a GEMS switch to meet all types of marine liquid level applications...to monitor and control levels, signal alarms, and to provide oil/water interface. Ideal for use with diesel engine fuel tanks, lube oil reservoirs, ballast, bilge, or oil sump tanks or for other common shipboard uses.



58000 Series Single or Multi-Level Switches.

Custom-made switches, using standard components, are supplied with various mounting methods, lengths, floats, materials, etc. to suit the application.

LS-35565 (brass)/ LS-56060 (stainless steel) Externally Mounted Models.



For use where access to inside of tanks is limited, such as on lube oil or fuel day tanks. Custom-length housings. Provide ease of maintenance and tank cleaning.

LS-270 Model with Protective Shielding for Turbulent In-Tank Conditions.



Small and compact, unit side-mounts in tank. Ideal for low level bilge or sump tanks, and oil/water interface.

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Mobilgard 450* A fourth generation marine diesel engine oil with a 13.5 TBN! Acid neutralization has never been higher, so engine wear has never been lower and engines have never been cleaner.

What's more, Mobilgard 450 has superior alkalinity retention, higher detergent/dispersant qualities, is extremely stable at high temperatures, and exceeds API-CD performance. Result: money saved in parts, maintenance, scheduled downtime, and overall operating costs. And that's right now. Today!

But what about tomorrow? Those tugs, towboats and ferries, with their advanced, high-output diesel engines, are destined for continuous tough duty. What if you have to go to fuels with higher sulfur content?

Look at the chart and relax: continued high-protection performance, far and above that provided by third generation oils, even with the dirtiest fuels. And we're talking experience... not experiments. Mobilgard 450 has logged more than a million engine operating hours worldwide, with results persuasive enough to encourage a growing number of equipment builder endorsements.

Shouldn't you put Mobilgard 450 in your picture, starting now? Call the Mobil Information Center: **1-800-634-3100.**

We'll send you additional information PLUS a reproduction of this original watercolor.

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Alkalinity Retention	+50%	+60%	+80%	+95%
Insolubles Control	+40%	+50%	+60%	+70%
Oil Life	+50%	+75%	+85%	+90%
Filter Life	+50%	+60%	+70%	+80%



Marine Coatings Review — Muhlhan Group

Marine Coatings Review — Palmer

(continued from page 44)

primer is a corrosion-resistant coating that creates an excellent adhesive bond between the deck and the PM-249 underlayment. PM-249 is an ambient-curing, self-

tional underwriters on a long-term basis.

In addition to recent projects in

leveling polyurethane that produces a continuous elastomeric polymer. It is applied at a minimum of 70 mils. (PM-2490 is specifically formulated for cambered decks or other sloping areas.)

After proper curing of the PM-249, PM-1665 polyurethane non-skid is applied. This is a high-performance coating that was developed for use in areas where flexibility and toughness are required.

PACIFIC MARINE SERVICES

Circle 48 on Reader Service Card

The non-skid is available in roll or spray versions.

PM-1315U is a two-part polyurethane sealer and dress coat designed for use with the PM-1665 non-skid. The dress coat can also be used to apply lines or other markings on the deck.

Palmer International also manufactures Chocktite Green, a pourable chocking compound that is approved by the American Bureau

of Shipping, Lloyd's Register of Shipping, Nippon Kaiji Kyokai, and Det norske Veritas.

of Shipping, Lloyd's Register of Shipping, Nippon Kaiji Kyokai, and Det norske Veritas.

PERFORMANCE HULL CLEANING SERVICES

Circle 49 on Reader Service Card

Performance Hull Cleaning Services, Inc. of New Orleans and Menomonee Falls, Wisc., provides customers with hull surface management technology. Using data from many Naval research facilities, the company has obtained hull cleaning and antifoulant reactivation procedures of the highest level available anywhere.

Remarkable savings are obtained by: proper reactivation schedules obtained by computer, individualized for each vessel; comprehensive underwater color video surveys; drydock extensions up to five years. The economies can be further increased by using special reactivatable paints that greatly reduce hull surface roughness.

Using data supplied by the customer on an easy-to-read survey, the Comtrax computer determines the hull surface management program for each vessel based on operational and geographical history. The data is updated at every reactivation with on-site inspections.

Ship personnel can see for themselves, using the company's professional camera divers, how the job is being done and the condition of the hull by use of a TV monitor on the service vessel. Video tapes of the operation will be sent to the customer free of charge, upon request, so that the customer's own engineers can evaluate the operation.

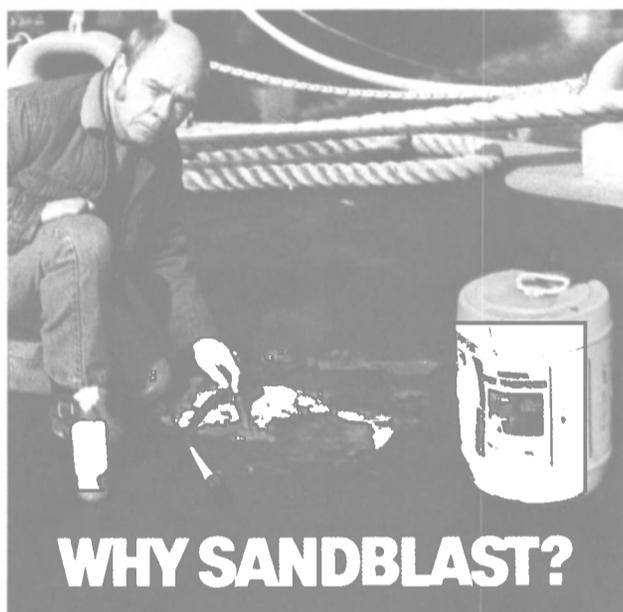
Performance Hull Cleaning reactivates an average of about 24,500 square feet per hour. If necessity dictates, on larger vessels, the company can double that production rate by adding another sub.

PHILADELPHIA RESINS

Circle 50 on Reader Service Card

Philadelphia Resins Corporation of Montgomeryville, Pa., manufactures the Phillyclad® 1000 Series, a two-component, catalyzed epoxy protective coating designed for demanding marine and industrial requirements. It can be used on interior and exterior surfaces of steel, concrete, masonry, wood, etc., where there is a need for resistance to chemicals, moisture, abrasion, and impact.

Phillyclad 1000 Series offers long-term durability in the painting and protection of steel, concrete, and wood decks; steel fuel storage tanks, pipelines, and other steel structures. It is non-toxic when cured 3-4 days at 72 F) and



"We saved \$79,400 by using CHESTERTON RUST TRANSFORMER"

The U.S.S. Laffey had been decommissioned and permanently docked at Patriots Point Naval and Maritime Museum, Charleston, South Carolina.

Sea water and salt air were taking their toll on the deck and superstructure.

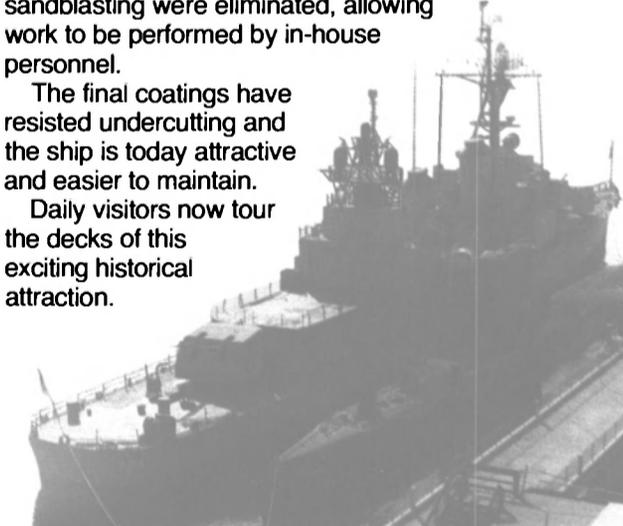
It was the job of Maintenance Supervisor George R. Maynard to restore and then maintain the ship.

To remove the rust and prepare the surface for priming, he received sandblasting estimates ranging from \$80,000 to \$125,000.

Using \$600 worth of CHESTERTON RUST TRANSFORMER he was able to prepare a rust-free surface ready for primer coat. The problems of sandblasting were eliminated, allowing work to be performed by in-house personnel.

The final coatings have resisted undercutting and the ship is today attractive and easier to maintain.

Daily visitors now tour the decks of this exciting historical attraction.



CHESTERTON RUST TRANSFORMER is available in all major ports from Distributors with Factory Trained Specialists to advise you on application techniques.

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GREECE : P. Wigham Richardson (Hellas) Co. - Tx 212332
GERMANY : H. Glahr & Co. - Tx 245537
HOLLAND : Ruysch - Tx 49149
INDIA : Nautilus - Tx 115062
HONG KONG: Manners - Tx 73314

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U.K. : Henry T. Meadows & Sons Ltd
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GREECE : Phoenix S.A. - Tx 212395
GERMANY : Wilhelm Schmidt - Tx 215278

INDIA : Argaind - Tx 6719
HONG KONG: Manners - Tx 73314



CANTIERI

tenance protective coatings not in direct contact with food, etc.

The 1000 Series is also available as an anti-slip deck coating where safety and durability are prime requirements.

When coating steel, blast cleaning to near white metal is recommended. If that is not possible, water blast or mechanical preparation is an alternative if done carefully.

Prime coats are recommended to seal porous surfaces such as concrete and wood. When a prime coat is required, the first coat of the 1000 Series is reduced 30 percent with PRT-59 solvent; this improves first-coat penetration resulting in excellent adhesion.

Phillyclad 1000 Series epoxy coating without aggregate is easily sprayed, rolled, or brushed. For the final coat with anti-slip aggregate in the coating, a low-pile, mohair type roller is recommended.

PHOSMARINE

Circle 51 on Reader Service Card

Phosmarine Equipment S.A. of Marseille, France, provides the BRUSH-KART® underwater hull cleaning service. Diver-driven for greater efficiency and flexibility, the unit removes marine growth that eats up expensive fuel oil. It can do it in a matter of hours instead of days, while the ship is loading, unloading, or at anchor, causing no delays in ship scheduling. With regular hull cleanings that can be performed between drydock cycles, BRUSH-KART more than pays for itself with impressive savings in fuel operating costs.

Because it is hydraulically operated, the device is said to be safer, faster, and more efficient than any other hull cleaning units available. As it travels underwater along the hull of a ship, it cleans with a thoroughness not attainable with hand-held brushes and scrubbers. It can also operate under sea conditions that are normally impossible for other methods.

BRUSH-KART's hydraulic power is supplied to the three brushing units by a single, 328-foot-long, coaxial floating hose. Power source is a 52-bhp diesel engine. The unit is fitted with safety gear that not only meets government and Lloyd's of London requirements, but also allows the unit to be used in the vicinity of unloading tankers.

When in use, the BRUSH-KART is positively buoyant in the water. It clings to the hull surface with a clamping force of 1,390 pounds of suction. This holds the brushes tightly to the hull and provides grip for the driving wheels.

PRC

Circle 52 on Reader Service Card

Products Research & Chemical

Corporation (PRC) of Glendale, Calif., manufactures Proreco® deck coating systems that have been applied to more than one million square feet of exterior decks of commercial ships, military vessels, towboats, offshore rigs, and a variety of smaller vessels. The interior and exterior Proreco coating systems are fire-retardant, and resistant to acids, caustic chemicals, and petroleum products.

Proreco III exterior coating systems are used to virtually eliminate costly maintenance and downtime for working ships. These systems are specified by many naval architects and by the military due to their known track record for corrosion control, dependability, and long wear.

Proven to be effective, the Proreco III systems have an inherent flexibility to withstand normal

stress caused by deck movement. The fire-retardant systems provide the ultimate in corrosion control and are resistant to the heaviest abrasion and impact. The Proreco elastomeric base is not brittle and not subject to cracking, chipping, or spralling.

The Proreco I coating system is specified for habitability areas such

(continued on page 48)

PALMER DURADECK OFF-SHORE NON-SLIP COATING

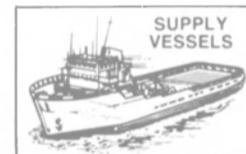
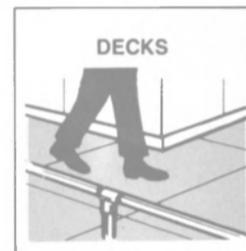
Over 100,000,000 sq. ft. coated with Palmer non-skids since 1946; 3 million sq. ft. last year.

Here are some good reasons why DURADECK is widely used as an off-shore non-slip coating . . . It's long lasting and economical to use • Resists chemicals, solvents, oils and seawater • Has superior corrosion resistance • Withstands heavy traffic on all working surfaces and helipads . . . most importantly, DURADECK reduces accidents, caused by slips and falls.

Palmer chemists formulated DURADECK especially for off-shore use. They have been solving non-slip coating problems for over 35 years. For more information, write for our free catalog or call our applications engineers at (800) 341-4408; in Pa. (215) 584-4241.

DURADECK is available from any of our U.S. distributors and our subsidiary PPI Ltd. in Europe.

DURADECK is another product from Palmer International, who also provides CHOCKTITE GREEN, a pourable chocking compound.



RIG DECKS AND HELIPADS



Palmer International, Worcester, Pa. 19490 (800) 341-4408 TWX #510-660-7736
PPI Ltd., Hartlepool Cleveland, England, TS 25 2BS Tel (44) 429 33913 Tlx (851) 587236

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Air Horns — S/S Propellers

NATIONAL FLUID SEPARATORS, INC.

Bilgemaster Automatic Oily/Water
Separator Systems

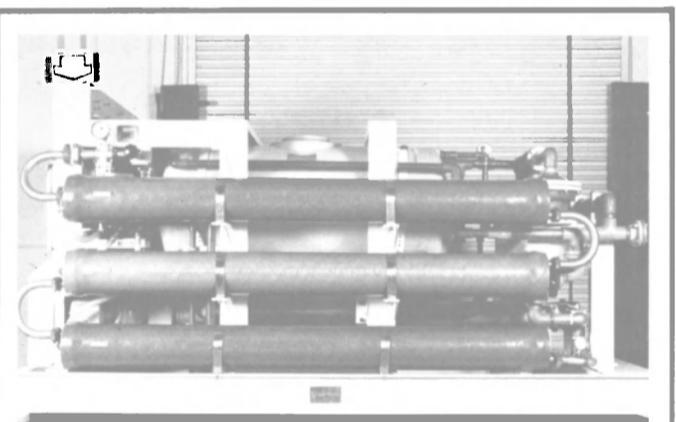
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Marine Coatings Review —PRC

(continued from page 47)

as heads, galleys, and mess decks. It has proved itself again and again as a low-cost, minimal maintenance system for living spaces. Proreco I polyurethane coating provides an attractive,

high-gloss appearance coupled with the long-wearing capability and flexibility to withstand structural movement, impact and abrasion, with extended corrosion control.

PRC developed the first one-part polysulfide marine caulk many years ago. Through high technological research and development facilities, PRC continues to develop superior coatings and seal-

ants to meet most high-performance requirements for such products above and below the waterline.

SEAGUARD

Circle 53 on Reader Service Card

Seaguard Corporation of Portsmouth, Va., continues to manufacture a complete line of high-quality,

high-performance marine paints for both commercial and government applications.

Some of Seaguard's more recent products include the following:

Balcoat 2000 is an all-purpose, single-component, rust-inhibitive compound that can be applied to marginally prepared surfaces. Intended for use in dry voids and ballast tanks, it should not be used in tanks containing petroleum products.

No Rust 1000 HS is a high-solids, single-component, rust-inhibitive compound formulated to dry hard. It is said to be excellent for exterior/interior application over marginally prepared surfaces for extended protection.

Fire-retardant latex is a non-emissive, fire-retardant, general purpose paint that is both protective and decorative. It is intended for application as a fire-protective coating for steel, aluminum, and non-metallic substrates. Wherever possible, this coating should be applied over a surface that has been degreased, and primed to promote adhesion.

Silcoguard 600 Series is a high-performance, silicone alkyd gloss enamel that gives excellent weather resistance, gloss and color retention over long periods, and easily cleaned surfaces.

Seaguard also carries Seawash[®], a water-based, biodegradable, non-flammable non-toxic cleaner for petroleum-based products. It takes on the toughest marine cleaning jobs, and is available in 55-gallon drums and a handy 5-gallon pail.



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There's more to the "Samsung Formula" than just on-time delivery, competitive costs and quality. Our formula also contains many ingredients that are important to any shipowner such as modern management systems, experienced manpower and a modern shipyard, complete with all the amenities. And in the way of technology, we have made the perfect blend of European and Asian technologies

that enable us to build sea-going vessels second-to-none. For your next shipbuilding project, give us a call and we will meet your specifications fully applying the "Samsung Formula" in the best tradition of master shipbuilders. Samsung, the company that works for you!



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SERMATECH

Circle 54 on Reader Service Card

Sermatech International of Moss Point, Miss., is a producer and applicator of corrosion-resistant coatings for marine/offshore, aerospace, and industrial activities. There are eight Sermatech processing facilities worldwide for rapid service delivery.

These coating systems for marine/offshore and industrial uses are generally multi-layered, composite coatings comprising base coats of heat-cured ceramic-metallic material, overcoated with a sealant designed to meet the environmental conditions in which the part is to be installed.

Sermatech's 725 and 1141 systems have proven the equal of most exotic corrosion-resistant materials in the marine environment, but because they are sacrificial, have none of the corrosion-promoting properties of expensive CRES. Tested extensively by both Government and industry, Sermatech coatings typically withstand exposure to salt fog (ASTM B117) for periods in excess of 5,000 hours. Similarly, the expected endurance

in splash spray exposure tests is at least one year of rust-free service.

Because Sermatech can be applied at DFTs down to 0.0004 inches, the coating systems are widely used on fasteners and other assemblies with faying surfaces and close-tolerance fit. SermeTel 725 and SermeTel 1141 conform to MIL-C-81751B, and are specified for all Government-procured Level 1 fasteners.

Sermatech numbers among its customers Bath Iron Works, Ingalls Shipbuilding Division, Dover-Norris, Waeco Valve, Gleason Velan Valves, Chiles Drilling, General Electric, Dupont, United Technologies-Hamilton Standard, PPG Industries, and DAF-Indal.

For corrosion-resistant fasteners, valves, couplings, structural steel, electrical housings, overhead lighting fixtures, pipe hangers, or any other metal part subject to severe marine environments, Sermatech coating could be a cost-effective answer.

SIGMA COATINGS

Circle 55 on Reader Service Card

Sigma, one of the oldest of the world's traditional paint and coatings manufacturers, continues to emphasize through research, development, and in-service experience those products that will enable vessel owners and operators to extend recoat intervals, whether for drydock work, on-board maintenance, or to provide alternatives to present painting and coatings practices. Sigma Coatings, Inc. is located in Garfield, N.J.

Sigmaplane, Sigma's hydrodissolving or smoothing antifouling now provides 60+ months of services, yet is acceptable as a one-coat antifouling for short service experience. Sigma's TCP 7476 is a high-build epoxy that will outperform, according to the manufacturer, other high-performance coatings and paint systems when applied over surfaces where blast cleaning is neither practical nor permitted. As a bottom anticorrosive, TCP can replace, with equally excellent results, the highly controversial coal tar epoxies.

Sigma's Rust-Gone II primer and finish coat system will provide a hard, durable high-gloss finish that touch dries in 10 to 15 minutes. The advantage of these products are that they are water-borne, and as such require no solvents for thinning or cleaning, display an unusual ease of application, and have an extremely long life.

In addition to an extensive product line, stocked and serviced at most principal ports throughout the world, Sigma provides a professional Technical Service Group that not only supervise all work in progress, but are available for consultation, inspection, and other services relating to the implementation of the "best" products and systems for the vessel or job.

New Filter Media Offers Greater Protection Against Abrasive Wear

To reduce downtime and prolong the life of hydraulic/lubrication components, Stauff Corporation of Waldwick, N.J., introduces the Betapure™ line of low- and high-pressure filter elements. The new elements capture silt size particles and virtually eliminate component failures due to abrasive wear.

The key component to the Stauff silt control element is the new Betapure media, which combines a higher beta absolute removal rating with greater dirt retention properties for longer service. Stauff disposable filter elements are tested to the latest ANSI/ISO standards, and are available in capacities to meet most industrial and heavy equipment requirements.

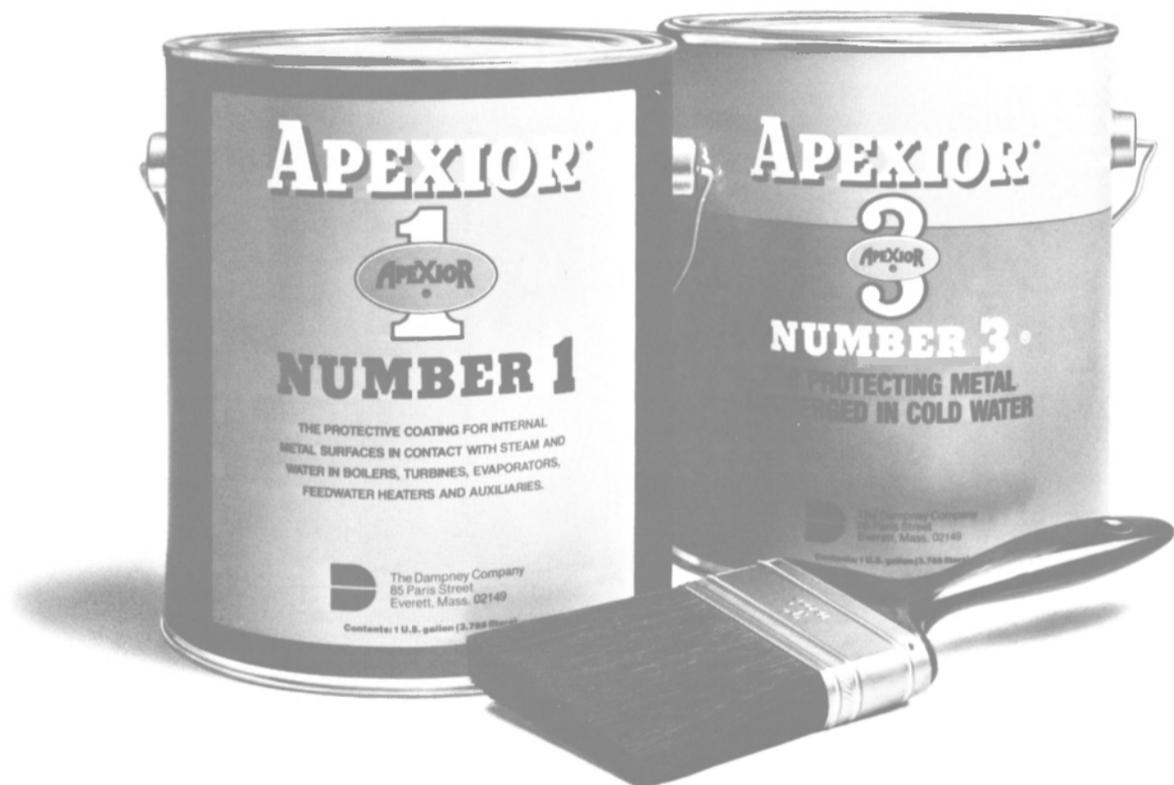
Element construction permits use in non-bypass, bypass, and reverse

flow applications with all hydraulic fluids including petroleum base, esthers, HWBF, water glycol, and inert emulsions. The reinforced pleat design of Stauff elements permits collapse ratings of 435 and 3,000 psid in 3, 5, 10 and 20 micrometer absolute removal ratings.

For more information on the Betapure elements,

Circle 14 on Reader Service Card

The "old masters" of waterside corrosion protection.



For more than seventy years, Apexior® Number 1® and Apexior® Number 3® coatings have been providing effective corrosion protection for metal exposed to fresh or salt water.

Apexior Number 1 is a heat-resistant organic coating for the protection of metal surfaces immersed in hot water at temperatures above 200°F (93°C). It protects the water-side surfaces of steam generating equipment, feed water heaters, de-aerators, evaporators, steam turbines, and diesel cylinder liners.

Apexior Number 3 protects metal surfaces that are frequently wet or exposed to high humidity, or that are immersed in water up to 140°F (60°C). It provides basic, low-cost protection for metal surfaces that are difficult to prepare properly. It is recommended for service conditions where the use of expensive high-performance coating systems cannot be justified.

Take advantage of the corrosion protection the "old masters" provide. Apexior coatings are available in the U.S. and Canada from your marine supplier or Dampney Company, Inc., 85 Paris Street, Everett, MA 02149. (617) 389-2805. Telex II 710-348-6716. Distributor inquiries invited.

 **Dampney**

Other Dampney products include Epodur® and Endcor® corrosion-resistant coatings, and Thurmalox® heat-resistant coatings.

First Of Five RO/RO-Containerships Delivered To ACL By Kockums Yard

The Atlantic Companion, first of five giant RO/RO-containerships scheduled to enter Atlantic Container Line's U.S. East Coast-U.K./Northern European service in 1984 arrived in New York on her maiden voyage recently, ushering in what ACL calls "a new era in North Atlantic shipping."

The 820-foot-long, 37,000-dwt Companion is the largest and most technologically advanced cargo ship ever built for the North Atlantic service, and like her sister ships to follow, was constructed to ACL design specifications. Designated as "G3s" by the company, they are the first new vessels built for ACL in 14 years, and will replace the fleet of five Second Generation steam-turbine-powered ships now in operation.

Designed by TransConsultants AB of Gotaverken and built in the Malmo, Sweden, shipyard of Kockums, the Atlantic Companion has a capacity for 2,130 TEUs as well

as space for 600 automobiles in the stern superstructure. Among the major features of the vessel are a large, multi-lane quarter stern ramp; permanent cell guides on the weather deck so that up to 1,410 TEU of containers can be stacked easily and safely, four per tier; and three decks for normal, heavy RO/RO cargo or for the block stowage of containers. The cell guide structure, stern ramp, and other RO/RO equipment were supplied by MacGregor-Navire.

According to Daniel J. Kerrigan, president of Atlantic Container Line-U.S.A., the Atlantic Companion and her four sister ships to follow—Atlantic Concert, Atlantic Compass, Atlantic Cartier, and Atlantic Conveyor—"represent the ultimate in design and cargo-carrying flexibility and efficiency." He added that the ships "will carry ACL into the 21st century as the premier carrier on the North Atlantic."



Atlantic Companion on her sea trials off southern Sweden

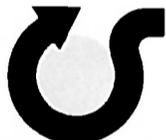
The ACL-USA chief executive also stated that "the G3s are a continuation of ACL's successful strategy of operating mixed-configuration vessels rather than cellular-only ships. He adds that the G3s "are particularly flexible with their ability to carry various mixes of containers, cars, genuine RO/RO, trailer-loaded cargo, and neobulk products."

The consortium's vessels fly the British flag (Cunard), Swedish flag (Swedish American Line, Transatlantic Steamship, and Wallenius Line), Dutch flag (Intercontinental Transport), and French flag (Compagnie Generale Maritime). Of the four sister ships that will be delivered this year, Kockums is building an additional two, one is being constructed at Swan Hunter Ship-

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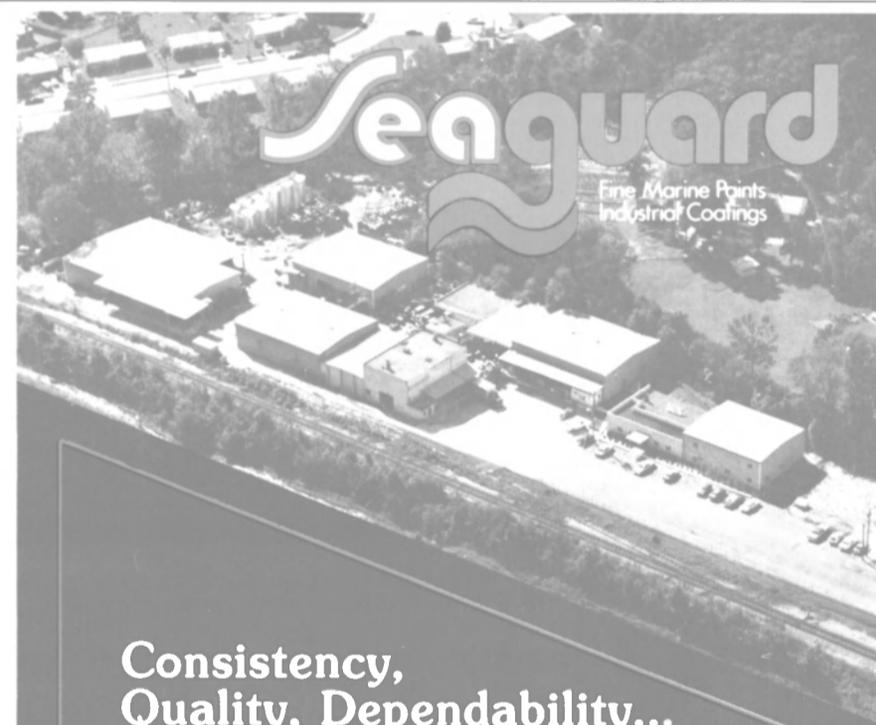
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Owners of small boats use Seaguard paints with the same confidence as do the U.S. military commercial shipyards, and large shipping fleets. Seaguard's modern and well-equipped laboratory and research facilities monitor the quality of Seaguard products, as well as planning new ones to meet future needs.

Seaguard product line includes: Inorganic Zinc, Epoxy Polyurethane, and Antifouling Shipbottom Paints.

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(804) 488-4411

builders at Wallsend, U.K., and Chantiers du Nord et de la Mediterranee at Dunkerque, France, is building one.

Main propulsion machinery in the Atlantic Companion consists of a six-cylinder, slow-speed Gotaverken/B&W 6L90GBE diesel engine developing a maximum continuous rating of 23,800 bhp at 97 rpm, direct-connected to a Stone Manganese Marine propeller. Electrical power is provided by four Wartsila/Vasa diesel engines, two 8R32 and two 6R32, directly connected to Norsk Elektrisk/Brown Boveri alternators of 2,310 kw and 1,722 kw, respectively.

Main and auxiliary engines are all capable of burning heavy fuel oil, providing a "single-fuel" installation. The ship is fitted with two KaMeWa thrusters, one forward and one aft.

ATLANTIC COMPANION Major Suppliers

Main engine	Gotaverken/B&W
Propeller	Stone Manganese
Bow & stern thrusters	KaMeWa
Propeller shaft	Bjorneborgs
Shaft bearings	Waukesha/Lips
Shaft couplings	Gotaverken
Stern tube bearing	Rialco
Stern tube seals	Cedervall & Soner
Main engine silencer	Mercurex
Engine controls	Marinelco
Alternators	Norsk Elektrisk & Brown Boveri
Alternator engines	Wartsila/Vasa
Emerg. alternator	Scania/Stamford
Evaporator; FO, DO & LO purifiers, main LO coolers, FW coolers	Alfa-Laval
Air compressors	Atlas Copco/Hatlapa
Air receivers	Hansen & Christensson
Oil-fired boiler, exh. gas boiler, steam drum, FO heaters	Sunrod
Oil burner	Nu-Way
FO test kit	Perolin
FO service pumps	Gebr. Steimel
FO viscosity control	Rossing & Jansson
Chem. cleaning tank system	Gamlen
Pumps	IMO/Scanpump/Comet Marine
Filters	Anderson & Groot/Boll & Kirch/Maxi-Flow
Air conditioning	Nordisk Vent.
Vent systems	Svenska Flakt
Ejectors	Zander & Ingstrom
Bilge ejectors	Golar Metall
Anti-heeling system	Frank Mohn
Vac. sewage system	Electrolux
Sewage treatment plant, incinerator system	Hamworthy
Electric motors	Brown Boveri Svenska
Fire alarm system	Salen & Wicander
Mach. alarm system	SAAB Scania
Bridge alarm panel	Soren T. Lyngso
CO ₂ extinguishing	Ginge
Halon extinguishing	Svenska Skum
Cargo control computer	Kockumation
Steering gear	Parsgrunn
Windlasses & winches	Norwinch
Anchors	Centromor
Anchor chain	Bulten Kanthal
Davits, accom. ladders	Welin
Lifeboats	Harding
Liferafts	RFD
Whistles	Kockumation
On-deck cell guides, stern ramp and door, ramp covers, bulkhead doors, hoistable car decks	MacGregor-Navire
Cranes	Lethab/Marine Transport Technology
Radars, ARPA, autopilot, gyrocompass, speed log, RAI	Sperry
Satnav/Loran C	Magnavox
Echo sounder	Honeywell-Elac
Radio station	ITT/Skanti
UHF radio, telephone and public address systems	L.M. Ericsson
Cathodic protection	Bergsoe
Coatings	International
Galley equipment	Electrolux

Considerable effort was expended in achieving a functional and economic bridge layout. The totally enclosed wheelhouse is arranged with control desks forward but having a walkway directly behind the windows. The bridge wing consoles are equipped for complete control of the main engine, bow and stern thrusters, and rudder, and have data readouts on all maneuvering functions.

For maximum safety, sophisti-

cated equipment installed includes an integrated Sperry radar system with ARPA functions and position information connected on-line to the adaptive automatic pilot, and a satellite communications system making possible fast communications via telephone and telex and incorporating a high-speed data link for loading information.

Cargo control instrumentation, featuring a Kockumation Loadmaster computer, as well as the

ship's safety instrumentation, is located in a separate control room on the starboard side of the superstructure, close to the lifeboats. The location of this control room gives easy access from cargo compartments and the accommodations area, as well as convenient escape routes in case of an emergency.

Without detracting from the importance of the other items of (continued on page 52)



Explosion-Proof Operations in all Hazard Zones with JDN Monorail Air Hoists and JDN Air Hoists

As the name implies, the drive energy of JDN air hoists and monorail air hoists is provided by compressed air. Air does not spark. This guarantees the fundamental safety inherent in all our lifting equipment for explosion hazard zones. Our air hoists are available in special designs with modified load-bearing elements for use in the highest-risk zones. These types preclude the possibility of any metal sparking.

JDN air hoists for loads from 100 kg to 100 t are of low weight in relation to their load-bearing capacities and are, therefore, easily transported. The lifting and lowering speeds can be accurately regulated by means of the cable control. All our lifting equipment is very sturdy and extremely resistant to aggressive environmental conditions.

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Circle 279 on Reader Service Card

**New Emergency Marker
Lights Introduced
By ACR Electronics**

A new line of emergency marker lights with provisions for attaching to a life vest or jacket has been announced by ACR Electronics of Hollywood, Fla. The three lights—Models 631, 632, and 633—are of similar design but each has dis-

tinctive features to suit individual preferences.

The 631, approved by the U.S. Coast Guard, is corrosion-resistant and has a flasher switch for maximum versatility. A low-drain bulb is said to provide up to 50 hours of life from a single D cell. A clear lens is standard, with green or red optional.

The 632 has a flashing circuit that makes it ideal as an emergency or marker light. It also has

a clear lens and is powered by one D cell. The 633 features a powerful xenon strobe and a flasher switch. Completely waterproof, it draws minimum power from AA batteries. All the new models have pin attachments for use as vest lights, and all are finished in the new international SOLAS orange.

For complete information on these ACR lights,

Circle 21 on Reader Service Card

Atlantic Companion

(continued from page 51)

cargo access equipment installed in the G3s, there is no doubt that MacGregor-Navire's weather deck cellguide system, named StackCell™, is the most important advance made in container stowage since the cellular concept was first introduced in the mid-50s. Until now, the biggest drawbacks with fixed weather deck cell guides have been the high weight and the impossibility of utilizing them in conjunction with hatch covers. Therefore, all weather deck cell guide systems have until now been mounted marginally above RO/RO spaces and odd deck areas without access to underdeck holds.

Utilizing the MacGregor-Navire side-rolling, piggy-back hatch cover, made possible by incorporating a moveable section of the cell guide in the area of the covers, cellular holds Nos. 1-5 can be loaded and discharged through the cell guides on the weather deck.

The twin hatches are fitted with two panels each, and open outboard. After the inner panel is raised hydraulically and the outer panel rolled beneath it, both are moved outboard in one unit to expose the holds and the cells below.

Another important feature of the StackCell system on the G3s is the versatility of being able to accommodate either 20-foot or 40-foot boxes simply by utilizing a moveable insert frame that divides a bay into two 20-foot cells, or is positioned at one end of the bay, where its inner face becomes the end of a 40-foot cell. Flexibility is further improved by the frames being only three cells wide, giving four different 20/40-foot ratios in each 12-row bay.

Crew accommodations are designed and outfitted to an extremely high standard, even for a Swedish owned and built ship. The master and the chief engineer each have a suite consisting of large sitting room, bedroom, bathroom, and office. Roomy individual cabins are provided for each member of the crew, which will range from 18 to 21—remarkably small for a ship of this size and an indication of the extensive automation designed into the ship.

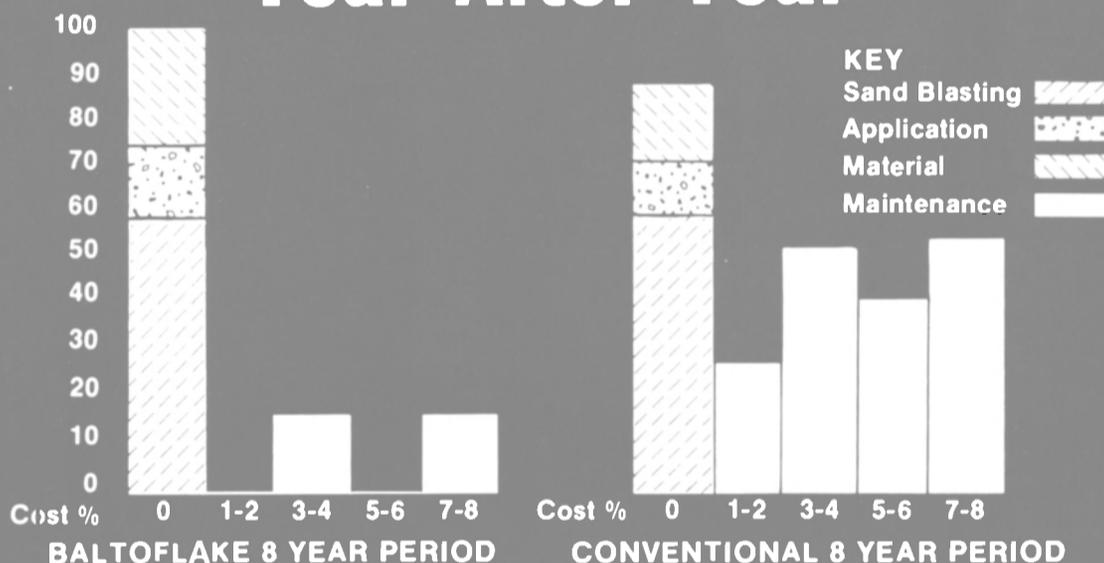
There is one large dining room/lounge, with a duty mess alongside for those who wish to eat in their working clothes. The galley is equipped with a full array of the most modern equipment available, all supplied by Electrolux Marine.

For the crew's relaxation there is a dayroom divided into bar, library, and television corner. There is also a sauna, an indoor swimming pool, and sports room 17 feet high for badminton, volleyball, and other such activities. A projection room for showing movies is connected to the sports room.

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BALTOFLAKE does cut maintenance costs. The money saving and time saving is shown on the chart. Note: There is no allowance for inflation or return on investment. The example is based on user experience. application cost is based on labor price per gallon/liter.

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Principals at recent M.A.N.-B&W seminar held in New York City included, (L to R): **Folker Bohm**, general manager, M.A.N.-B&W Diesel; **Werner Oehlers**, regional sales manager, M.A.N.-B&W Diesel; **Otto Voisard**, chairman of the Executive Board, M.A.N. Maschinenfabrik Augsburg-Nurnberg; **Werner Knapp**, president of American M.A.N. Corporation; **Karl Wojik**, head of Design Department, M.A.N.; **Claus Windelev**, executive vice president, American M.A.N.; and **Harry Falck**, marketing manager, American M.A.N.

Seminar In New York Introduces New Heavy-Fuel M.A.N.-B&W Engine

64-Page Technical Report Available



Otto Voisard
Chairman of the Executive Board
M.A.N. Maschinenfabrik

To introduce its new L58/64 heavy-fuel, four-stroke engine to the United States maritime community, M.A.N.-B&W Diesel recently hosted a seminar in New York City attended by shipowners, shipbuilders, and other industry representatives.

The M.A.N.-B&W executives who came to New York from the company's headquarters in Augsburg, West Germany, to address the large group attending the meeting were: **Otto Voisard**, chairman of the Executive Board, M.A.N. Mas-

chinenfabrik Augsburg-Nurnberg; **Folker Bohm**, general manager, M.A.N.-B&W Diesel; **Karl Wojik**, head of Design Department, M.A.N.; and **Werner Oehlers**, regional sales manager, M.A.N.-B&W Diesel.

Personnel from American M.A.N. Corporation in attendance at the seminar and the reception/lunch that followed included: **Werner Knapp**, recently elected president; **Claus Windelev**, executive vice president; **Ole Grunfeld**, technical manager; **Harry Falck**, marketing manager; and **Lars Thomsen**, service manager.

The new four-stroke, heavy-fuel engine will be produced as in-line units with 6, 7, 8, and 9 cylinders developing 1,650 bhp per cylinder at 428 rpm, having a bmep of 20×15 bars (292 psi), providing a power range (mcr) from 9,900 to 14,850 bhp.

The L58/64 diesel is a logical upgrading of M.A.N. medium-speed engines that have rendered excellent service in operation on heavy fuel for almost 20 years. This early understanding of heavy fuel burning characteristics was further extended by the 40/45 engine type, which was launched on the market in the 1970s, introducing a modern concept with high firing pressure—the basis for low fuel consumption. The 40/45 engines

with the longest service record have logged almost 30,000 hours of operation and have proved to be highly reliable in operation on the heavy fuel oil grades bunkered throughout the world. For this reason, this impressive engine type has "fathered" the major components of the L58/64 engine, as reliability is of particular importance for marine main engines.

During the development of the L58/64 engine, particular emphasis was placed on the following points:

- low fuel consumption rates;
- adaptability to varying operating and environmental conditions as well as fuel ignition qualities;
- high reliability; and
- simple and easy maintenance.

The L58/64 follows the same sturdy design philosophy as predecessor trunk-piston engines of M.A.N. design. Though the new engine is comparatively large, the frame consists of one sturdy casting, with an underslung crankshaft supported by bearings that are positioned and locked to the engine frame by both vertical and horizontal bolts. The shape of the resultant structure resembles a reinforced tunnel distinguished by

very high stability of the main bearings during engine operation.

The significance of the injection system for low fuel consumption rates was taken into account by a great development effort in the design of the L58/64. Measurements taken on engines of different sizes, as well as theoretical investigations, have revealed that reductions in fuel consumption are obtainable with higher injection pressures. The injection system of the 58/64 engine has therefore been designed for pressures of 1,300 bars.

During the test of the 3-cylinder trial L58/64 engine, the low fuel consumption rate of 125 grams per horsepower hour (0.27 lbs/hph) measured after the first 100 hours of operation is particularly noteworthy because, at that time, combustion had not been optimized. It should be borne in mind that the mechanical efficiency of a 3-cylinder engine is comparatively low. The turbocharger, which is smaller than that of production engines, negatively influences the fuel consumption rate as well. Considering these factors, the low fuel consumption rates aimed at for production 58/64 engines operating at different loads, including 123 g/hph at 85 percent of economy continuous rating, will definitely be reached and most probably even be undercut. M.A.N. estimates that the specific fuel consumption rate of the 9-cylinder 9L58/64 engine will be 121 g/hph.

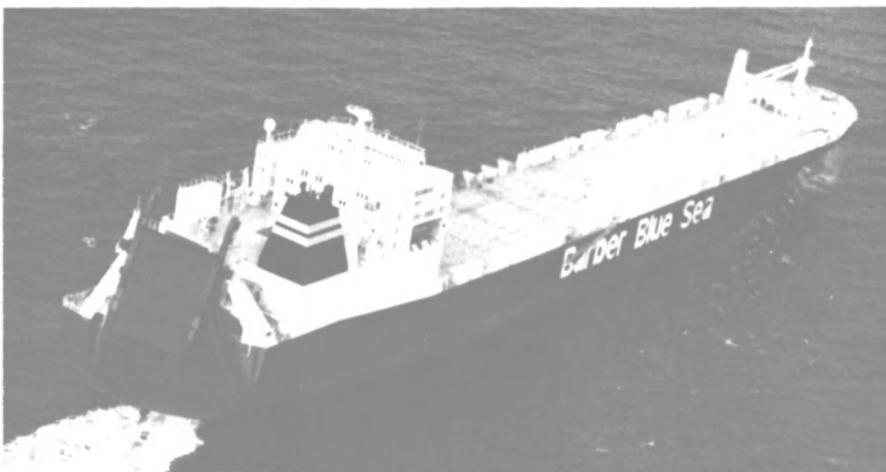
The test engine has been operated from the very beginning on 7,000 sec Redwood 1 fuel.

In addition to high operating efficiency, the 58/64 engines will provide an excellent opportunity for high waste heat recovery. Exhaust gas temperature downstream of the turbocharger will be 660 F over a broad operating range. In a number of marine applications, this means that the at-sea electrical load can be produced by the waste heat recovery system instead of operating an auxiliary diesel generator, an added fuel saving.

M.A.N.-B&W Diesel also produces a full line of two-stroke and four-stroke diesel engines with outputs from 500 to more than 56,000 bhp, heavy-fuel-burning auxiliary engine generator sets, complete propulsion systems with reduction gearing and controllable-pitch propellers, stationary power plants, and cogeneration packages.

An eight-page color brochure and a 64-page technical report on the new L58/64 engine are now available. These contain detailed technical data including specifications, ratings, performance data, test results, photographs, and cross section color drawings of the new engine and its key components. For a free copy,

Circle 15 on Reader Service Card



Second of three RO/RO ships ordered by BBSC.

Hyundai Shipyard Delivers Three Barber Blue Sea Line RO/ROs

Built by the Ulsan shipyard of Hyundai Heavy Industries Company, Ltd., the three largest RO/RO-containerships in the world entered the international service of

Barber Blue Sea recently. Called SuperCarriers by their owner, the Barber Tampa, Barber Texas, and Barber Hector are 860 feet long and have a capacity of 2,464 TEUs

of containers and 630 American-sized cars. They have been dubbed Free Trade Ships because the success of this \$200-million investment depends on free access to the world's markets, according to **Raymond R. Miles**, executive vice president of Barber Blue Sea. In ceremonies unusual because of their location, the first ship, Barber Tampa, was officially named upon her maiden voyage arrival in the Port of New York.

Headquartered in Oslo, Barber Blue Sea is a consortium of Wilh. Wilhelmsen of Norway, Ocean Transport & Trading of England, and Brostrom Shipping Company of Sweden. In 1979, BBS introduced its first SuperCarriers, six 1,800-TEU RO/RO-containerships built at a total cost of \$200 million. All of Barber's ships have the capability to transport both containerized and non-containerized cargo, including unboxed cars, rolling stock, trailers, refrigerated cargo, special containers, and heavy lifts.

In order to produce an optimum hull form for the Barber Texas and her two sister ships, a series of model tank tests were conducted at various research centers. Towing and cavitation tests were repeated as many as nine times at the Norwegian Hydrodynamic Laboratory. In addition, Hyundai retained the Swedish Maritime Research Center to conduct sea-keeping and maneuvering tests.

Considerable emphasis has been placed on the ship's safe operation. To improve damage stability, two watertight transverse bulkheads are partly fitted in the cargo space. Equal emphasis was put on maximum cargo loading capacity. Three fixed decks and two hoistable car decks are installed and the engine room's size is minimized, providing some 295,470 square feet of cargo deck area. Fixed ramps are fitted between decks.

For fast and easy cargo handling, an angled stern ramp 148 feet long with a minimum clear width of 41 feet is installed. Entrance height at the stern door is 50 feet. A side door with portable car ramp is also provided. At the forward end of the ship, a 40-ton electro-hydraulic cargo crane insures self-sustaining loading and unloading in that area.

Main propulsion is by a Hyundai/B&W 8L90GB diesel engine with maximum continuous rating of 36,600 bhp at 97 rpm, directly connected to a Kobe Steel propeller. Service speed of 19.5 knots at design draft of 32 feet is achieved at 85 percent of mcr (32,940 bhp at 94 rpm). KaMeWa 2,300-hp thrusters are fitted forward and aft to improve the vessel's maneuvering performance.

Electric power is provided by three diesel generators of 1,900 kw each, two diesel generators of 900 kw each, and a single turbo-generator of 1,000 kw. The unmanned machinery space can be controlled remotely by Terasaki equipment.

Built to Lloyd's Register of Shipping classification +100 A1, RO/RO Containership, +LMC, UMS, the Barber Tampa has a molded beam of 105.84 feet, molded depth of 68.90 feet, and scantling draft of 38.38 feet. At that draft the ship has a deadweight of approximately 44,000 metric tons.

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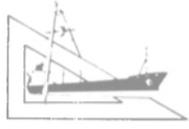
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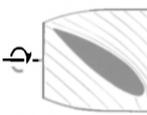
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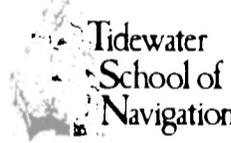
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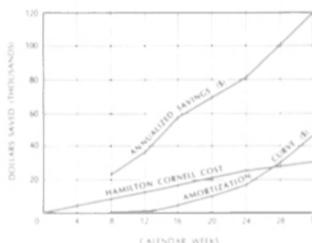
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"Certification is very difficult to obtain," says Mr. **Langeland**, "as Denmark adheres to both the Baltic Convention and the International Maritime Organization (IMO) Treaty of the Sea."

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**Foster Wheeler Names
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Henry J. Somerville has been appointed Director of Equipment Business Development for the newly-formed Corporate Business Development Group of Foster Wheeler Corporation. The group will direct Foster Wheeler's continued expansion into new fields of endeavor.

Mr. Somerville joined Foster Wheeler in July 1962 as an engineering trainee. He was appointed a field service engineer in 1963, project manager in 1970, and senior project manager, Equipment Division in 1973.

Foster Wheeler Corporation is an international engineering, manufacturing and construction organization with 26 subsidiaries operating worldwide. Its major U.S. operating subsidiary, Foster Wheeler Energy Corporation, designs, fabricates and constructs process plants, fired heaters and steam generating equipment for petroleum refiners, chemical producers and electric utilities. Both corporations are headquartered at Livingston, N.J.

**Four Executive Promotions
Announced By Rosenblatt**

Lester Rosenblatt, chairman of the board, M. Rosenblatt & Son, Inc., the worldwide naval architectural and marine engineering firm headquartered in New York, recently announced the appointment of Douglas J. Yuengling to the position of assistant vice president and director of marine engineering; Charles M. O'Brien to assistant vice president and director of ship design; Robert C. Umberger to assistant vice president and director of program management; and William J. Corcoran to assistant vice president and comptroller, all at the Washington Area branch office.



Douglas Yuengling

Charles O'Brien

Mr. Yuengling's responsibilities encompass propulsion plant, auxiliary systems, and electrical and electronics systems. Prior to joining M. Rosenblatt & Son in 1972 as assistant office manager, he was a senior engineer with Burns & Roe, Inc.; program manager at Curtiss Wright Corporation; and staff engineer at Vitro Laboratories. His earlier naval career, spanning some 21 years, included repair, conversion, maintenance, overhaul, inspection, and all phases of design on a wide variety of naval ships. Mr. Yuengling is a graduate of the U.S. Naval Academy and holds an advanced degree in mechanical engineering from the Naval Postgraduate School.

Mr. O'Brien joined the firm in 1976 as a project engineer and progressed to director of advanced ship concepts. His new responsibilities will embrace hull systems and all aspects of naval architecture. He served 21 years with the U.S. Navy during which he managed nuclear submarine overhauls, was ship design manager for submarine design, and was planning and estimating superintendent for surface ship and submarine overhauls. His education includes graduation from the U.S.

Naval Academy and advanced degrees in naval architecture and naval engineering from Massachusetts Institute of Technology.



Robert Umberger

William Corcoran

Since joining Rosenblatt in 1976 as a project engineer, Mr. Umberger became assistant branch manager and director of ship hull en-

gineering. He will be responsible for management of all special programs, including field office activities in Norfolk and Philadelphia. He brings with him 20 years of Navy experience covering shipyard construction, modernization, and contract administration supervision as well as destroyer design and personnel management. He is a Naval Academy graduate and holds an advanced degree from Webb Institute of Naval Architecture.

Mr. Corcoran's responsibilities include cost estimating for new contracts and fiscal management of the Washington Area Branch. He joined Rosenblatt in 1975 as contract administrator. Prior to this he was head of the branch for workload planning at Boston Naval Shipyard, and was technical data project officer for implementing Navy data management policy at Naval Material Command. He is a graduate of Northeastern University.

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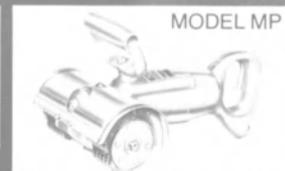
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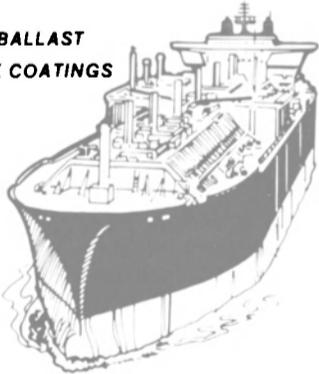
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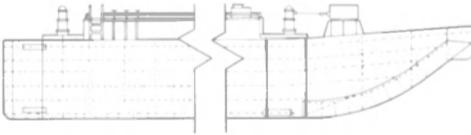
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Mechanical Resources, Inc., 210 West Side Ave., Jersey City, NJ 07305
Nance Industries, P.O. Box 1547, Beaumont, TX 77704-1547
Stal Refrigeration AB, Butangsgatan 16, S 601 87 Norrköping, Sweden
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Unitemp Inc., 3590 Kennedy Rd., So. Plainfield, NJ 07080
York Division, Borg-Warner Corp., P.O. Box 1592, York, PA 17405

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The Platt Bros. & Co., Box 1030, Waterbury, CT 06721

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North Star Marine & Industrial Products, Inc., 84 Wall Street, Farmingdale, NY 11735
Riley-Beard, P.O. Box 31115, Shreveport, LA 71130

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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

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Aqua-Dyne Inc., 2208 Karbach St., Houston, TX 77092
Atlantic Sandblasting & Coatings, Inc., 2700 Guy Verger Blvd., Tampa, FL 33605

Aurand, 1270 Ellis St., Cincinnati, OH 45223

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Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England

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E.I. DuPont de Nemours & Co., Inc., Starblast Division, Room X39186, Wilmington, DE 19898
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Schmidt Mfg. Inc., P.O. Box 37, Fresno, TX 77545

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Howe-Baker Engineers, Inc. (Econoflex Burners), Combustion Systems Div., P.O. Box 956, Tyler, TX 75710
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Hughes Bros., Inc., 17 Battery Pl., New York, N.Y. 10004

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National Marine Service Inc. (Transport Div.), 1750 Brentwood Blvd., St. Louis, MO 63144

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MacGregor Navire U.S.A. Inc., 135 Dermody St., Cranford, NJ 07016

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Philadelphia Resins Corp., 20 Commerce Drive, Montgomeryville, Pa. 18936

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Avicon Corp., 7750 East Redfield Rd., Scottsdale, AZ 85260
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Fluidyne, a Div. of Electrodata Inc., P.O. Box 11366, Santa Rosa, CA 95406
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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 Tralbold 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 Whippary Rd., Marriestown, 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, Skipack, 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
Goltzen 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 Westbrook 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., 5520 Los Santos Way, Suite 600, Jacksonville, FL 32211
C.T. Marine, 18 Church Street, Georgetown, CT 06829
CADCOM, 107 Ridgely Ave., Annapolis, MD 21401
Phillips Carner & 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

BUYERS DIRECTORY

(continued)

GEOD Corporation, 73 Oak Ridge Road, NJ 07438
Giannotti & 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
The Glossten Associates, Inc., 610 Colmon 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
Intramarine, 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
Janzen Engineering Co., 6655-H Amberton Drive, Baltimore, Md. 21227
James S. Kroger & 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
Metrilpac 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, 8248 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
Richard R. Taubler, Inc., 610 Carriage La., Dover, DE 19901
Timsco, 622 Azalea Road, Mobile, AL 36609
Tracor Hydraulics, 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. Birmekamp & 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
Alkinson 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-Nov 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 Peso, Firenze, Italy
Servo Corporation of America, 111 New South Road, Hicksville, NY 11802
Simrad, Inc., 2208 N.W. Market St., Suite 600, Seattle, WA 98107
Sperry Corporation, Great Neck, NY 11020
Standard Communications, P.O. Box 92151, Los Angeles, CA 90009
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 Sales Office (Domestic), 433 Hackensack Avenue, Hackensack, NJ 07601

Gulf Oil Trading Co., 535 Madison Ave., New York, NY 10022
Mobil Oil Corp., 150 East 42 Street, New York, NY 10017
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. (Wesifolia Separators), 100 Fairway Court, Northvale, NJ 07647
Dahl Manufacturing, Inc., 2521 Railroad Ave., Ceres, CA 95307
Hyde Products, Inc. 810 Sharon Dr., Westlake, OH 44148
Microphor, Inc., P.O. Box 490, Willis, 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 Marine 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, 4700 Ramona Blvd., Monterey Park, CA 91754
Argo Marine, 140 Franklin St., New York, NY 10013
Bareco, 6910 East 14th St., Tulsa, OK 74112
A.W. Chesterton Co., Middlesex Industrial Park, Rt. 93, Stoneham, MA 02180
Chugoku Marine Paints (U.S.A.) Inc., 1290 Ave. of Americas, New York, NY 10104
CLEMCO, P.O. Box 7680, San Francisco, CA 94120
"CONSOL" manufactured by Contact Paint & Chemical Co. Inc., 200 S. Franklinton Rd., Baltimore, MD 21223
Devco 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
Glidden Coatings & Resins, Architectural & Maintenance, 925 Euclid Ave., Cleveland, OH 44115
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 Point Co., Inc., 1912 Darby Rd., Havertown, PA 19083
Jatun Marine Coatings Inc., 840 Key Hwy., Baltimore, MD 21230
Magnus Maritek 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
Pile-Gard* Manufactured by Osmose-Marine Div., P.O. Drawer 0, Griffin, GA 30224
Products Research & Chemical Corp., 5454 San Fernando Rd., Glendale, CA 91203
Seaguard, 4030 Seaguard Ave., Portsmouth, VA 23705
Selby, Battersby & Company, 5220 Whiby Avenue, Philadelphia, PA 19143
Sermatech International, 4401 Sermetel Dr., Mass Point, MS 39563
PETROLEUM SUPPLIES
Shell Oil Co., 1 Shell Plaza, Houston, Texas 77002
PIER REPAIRS
Acquatic Marine Systems, Inc., P.O. Box 326, Williamsville, NY 14221
PIPE-HOSE—Cargo Transfer, Clamps, Couplings, Coatings
Cajon 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 Div./Hudson Engineering Co., One World Trade Center, Suite 3000, New York, NY 10048
Selkirk Metalbestos, Box 19000, Greensboro, NC 27419
Stauff 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
Aquamaster, 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., Wapole, 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 Lawton Avenue, Beloit, WI 53511
Columbian Bronze Corporation, 216 No. Main Street, Freeport, NY 11520
Combustion Engineering, Inc., Windsor, Connecticut 06095
Daihatsu Diesel (USA) Inc., 180 Adams Ave., Hauppauge, NY 11788
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
Gallen Marine Co., Inc., 160 Van 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
KaMeWa, 1800 West Loop So., Suite 1620, Houston, TX 77027
Krupp Mak Diesels, Inc., 4329-33 Di Paolo Center, Glenview, IL 60025
Lips Propellers, 3617 Koppers Way, Chesapeake, VA 23323
Lufkin Industries, Inc., P.O. Box 749, Lufkin, TX 75901
M.A.N.-B&W Diesel, 2, Ostervej, DK-4960 Høleby, Denmark
MTU of North America, One E. Putnam Ave., Greenwich, CT 06830, 10450 Corporate Dr., Sugarland, TX 77478; 2945 Railroad Ave., Morgan City, LA 70203; 180 Nickerson St., Seattle, WA 98109, 1730 Lynn St., Arlington, VA 22209
MWM-Murphy Diesel, 12 Greenway Plaza, Suite 1100, Houston, TX 77046
Mapeco Products, Inc., 20 Vesey St., New York, NY 10007
Maritime Industries Ltd., 6307 Laurel St. Burnaby, B.C., Canada V5B3B3
Michigan Wheel, 1501 Buchanan Ave., S.W., Grand Rapids, MI 49507
National Marine Service Louisiana, Inc., 222 Bayou Rd., Belle Chasse, LA 70037
Omnithruster Inc., 9515 Sorensen Ave., Santa Fe Springs, CA 90670
Penske GM Power, Inc., 600 Parsippany Road, Parsippany, 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, Salina, KS 67401
Turbine Specialties/Gulf Coast, Inc., 1900 Industrial Blvd., Harvey, LA 70058
Ulstein Trading Ltd. A/S, N-6-65, Ulsteinvik, Norway
Voith Schneider America, 159 Great Neck Rd., Ste 200, Great Neck, NY 11021
Valvo 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 Div./Hudson Engineering Co., One World Trade Center, Suite 3000, New York, NY 10048
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 Von Buren St., P.O. Box 845, Calton, 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 (Belmar), 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 Loriton Center, Edison, NJ 08817
Robertson, 135 Fort Lee Rd., Leonia, NJ 07605
SAFETY EQUIPMENT
Warmold Fire Systems, One Stanton St., Marinette, WI 54143
SANITATION DEVICES—Pollution Control
Argo Marine, 140 Franklin St., New York, NY 10013
Davitt Sales Inc., P.O. Box 232, Jefferson Valley, NY 10535
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111
FAST Sewage Systems, Div. of St. Louis Ship, 611 East Marceau St., St. Louis, MO 63111
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., Wapole, MA 02081
Crane Packing Company, 435 Regina Dr., Clarksburg, MD 20734
EG&G Sealol, Engineered Products Div., Marine Products Group, Warwick, RI 02888
Penco Div./Hudson Engineering Co., One World Trade Center, Suite 3000, New York, NY 10048
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 Maestranzas 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
Alliantic Marine Inc., P.O. Box 138, Ft. George Island, Jacksonville, FL 32226
Avondale Shipyards, Inc., P.O. Box 52080, New Orleans, La. 70150
Both 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
Blomh & Voss Company, 55 Morris Avenue, Springfield, NJ 07081
Burmeister & Wain Skibsvaerft A/S, P.O. Box 2122, Refshaleoen-1015 Copenhagen K-Denmark
Burrard Yarrow's 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
Corrington Slipways Pty. Ltd., Old Punl Rd., Tomago NSW Australia 2322
Conrad Industries, P.O. Box 790, Morgan City, La. 70380
Cunaco 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, Changsung-PO, Koje-Kun, Kyungnam, 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, Panama 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 Livingston 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
Golden Marine Co., Inc., 60 Van Brunt St., Brooklyn, NY 11231
HBC Barge, Inc., Grant Building, Pittsburgh, PA 15219

Lapeyre Offers New Brochure On Its Alternating Tread Stair

Lapeyre Stair, Inc. of New Orleans has just released its new four-color brochure on the Lapeyre Stair®, an innovative, alternating tread type stair that saves up to 50 percent of the floor space required by the steepest conventional stair while offering a degree of comfort, utility, and safety superior to any stair of comparable angle.

All Lapeyre Stairs meet OSHA and Coast Guard requirements. Each stair is custom built to the exact height specified, and delivered ready for quick, easy installation. In addition to aluminum natural finish, the Lapeyre Stair comes in gray-primed carbon steel (with optional safety yellow paint finish), hot-dipped galvanized steel, or stainless steel.

For a free copy of the new Lapeyre brochure,

Circle 98 on Reader Service Card

PBM Introduces New Line Of Valve Manifolds — Literature Available

PBM is offering new literature on their new line of 6 to 12 valve manifolds. The manifolds are finding favor among design engineers

working with automated or computerized piping systems.

Featuring a more positive and more efficient fluid control, these special configurations offer an economic advantage by reducing the overall number of valves and related control components required by the system. Additionally, programming for computerized systems is simplified.

Valves that can be manifolded range in size from 1/2" to 4", and metals may be selected from 316 stainless steel, carbon steel, bronze and weldex. Pressure rating is 400 psig and seats and seals are available to withstand 500°F temperatures. Several styles of actuators are offered.

For more information and free literature on PBM's valve manifolds,

Circle 84 on Reader Service Card

New Rope Catalog Available From Samson

The world's most extensive line of braided, round plaited and inline ropes is described and illustrated in a new catalog just released by Samson Ocean Systems, Inc.

The catalog provides specifications, breaking strengths, elongation data and weights for ropes made of Duron® and Dacron Polyester, Nylon, Polypropylene and Kevlar aramid fibers. In addition,

there is information on four types of Samthane™ Coatings and extra cover chafe sleeves used for abrasion protection and identification; heavy duty thimbles and shackles; and the new Samson line of Nylite™ rope connectors, clevis hooks and snatch blocks.

For a free copy of Samson's catalog,

Circle 86 on Reader Service Card

U.S. Navy Solicits Suggestions For Improving Pump Specification

Recognizing that the formal process for review of specifications provides for only a short review period, the Naval Sea Systems Command is soliciting technical suggestions for improving specifications which it plans to revise in the next several months. This specification is: MIL-P-19131, Pumps, Rotary, Power-Driven, Miscellaneous.

This specification covers positive displacement, power driven, miscellaneous, rotary pumps, and requires that manufacturers qualify their products for inclusion in a qualified products list (QPL). When a purchase is contemplated, only those manufacturers whose equipment has previously been qualified will be solicited.

Beneficial comments (additions and/or deletions with suggested

new wording) with associated justification and explanation as to how the changes are in the Government's interest are solicited, as well as pertinent data which may be of use in improving these documents.

Single copies of the specification may be obtained from the Commanding Officer, U.S. Naval Publication and Forms Center, 5801 Tabor Avenue, Philadelphia, Pa., 19120.

Comments should be sent to Commander, Naval Sea Systems Command, SEA 56Y21, Department of the Navy, Washington, DC 20362, Attn: T.F. Krokus. (202) 692-6826.

Data Sheet On Filters And Strainers Offered By Parker Hannifin Filter Division

A new data sheet outlining the filters and strainers is available from Parker Hannifin Corporation's Filter Division. Designed for hydraulic, fuel, lube oil, and water systems, Parker products include duplex strainers, pressure filters, suction and return line filters, and a portable filtration system. The data sheet also illustrates typical applications for Parker products.

For a copy of the Parker data sheet,

Circle 92 on Reader Service Card

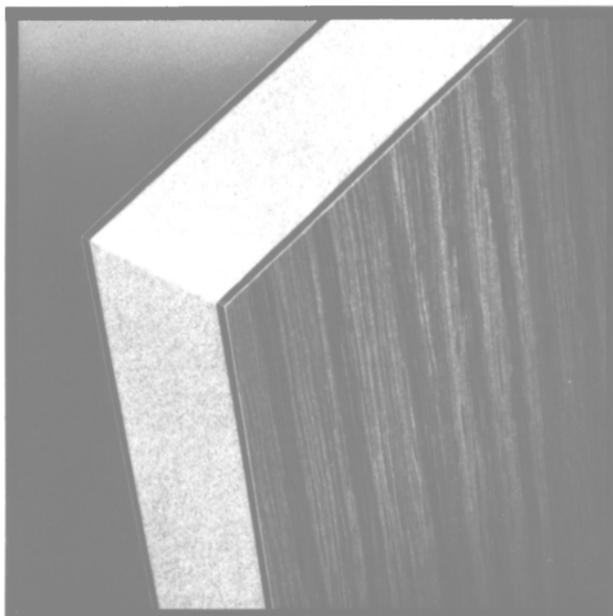
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 National Steel & Shipbuilding Corp., San Diego, Calif. 92112
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 Newport News Shipbuilding & Dry Dock Co., 4101 Washington Ave., Newport News, Va. 23607
 North Florida Shipyards, P.O. Box 3863, Jacksonville, FL 32206
 O.A.R.N. (Officine Allestimento-Riprazioni Navi), P.O. Box 1395, Genoa, Italy 16100
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 Rauma-Repola, 26100 Rauma 10, Finland
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 Vickers Cockatoo Dockyard Pty. Ltd., P.O. Box 162 Milsons Point, N.S.W. 2061, Australia

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 Butterworth Systems (UK), 123 Beddington Lane, Croydon CR9 4NX, England
 Penco Div./Hudson Engineering Co., One World Trade Center, Suite 3000, New York, NY 10048
 Petrochemical Services, Inc., 3820 Dauphine St., New Orleans, LA 70117
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 Bulkfleet Marine Corporation, 1800 West Loop So., Houston TX 77027
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 McDonough Marine Service, P.O. Box 26206, New Orleans, La.
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 Jamesbury Corp., 640 Lincoln Street, Worcester, MA 01605
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 Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559
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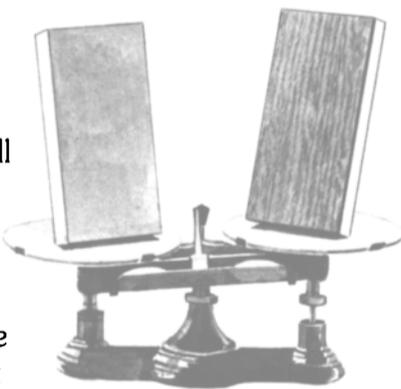
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Firetest 80-32 Marine Joiner Panels are manufactured and sold by Masonite Corporation Commercial Division, Marine Business Department . . . serving the marine and offshore drilling industry with a total package of interior products. For details, write or phone toll free 1-800-241-7533.



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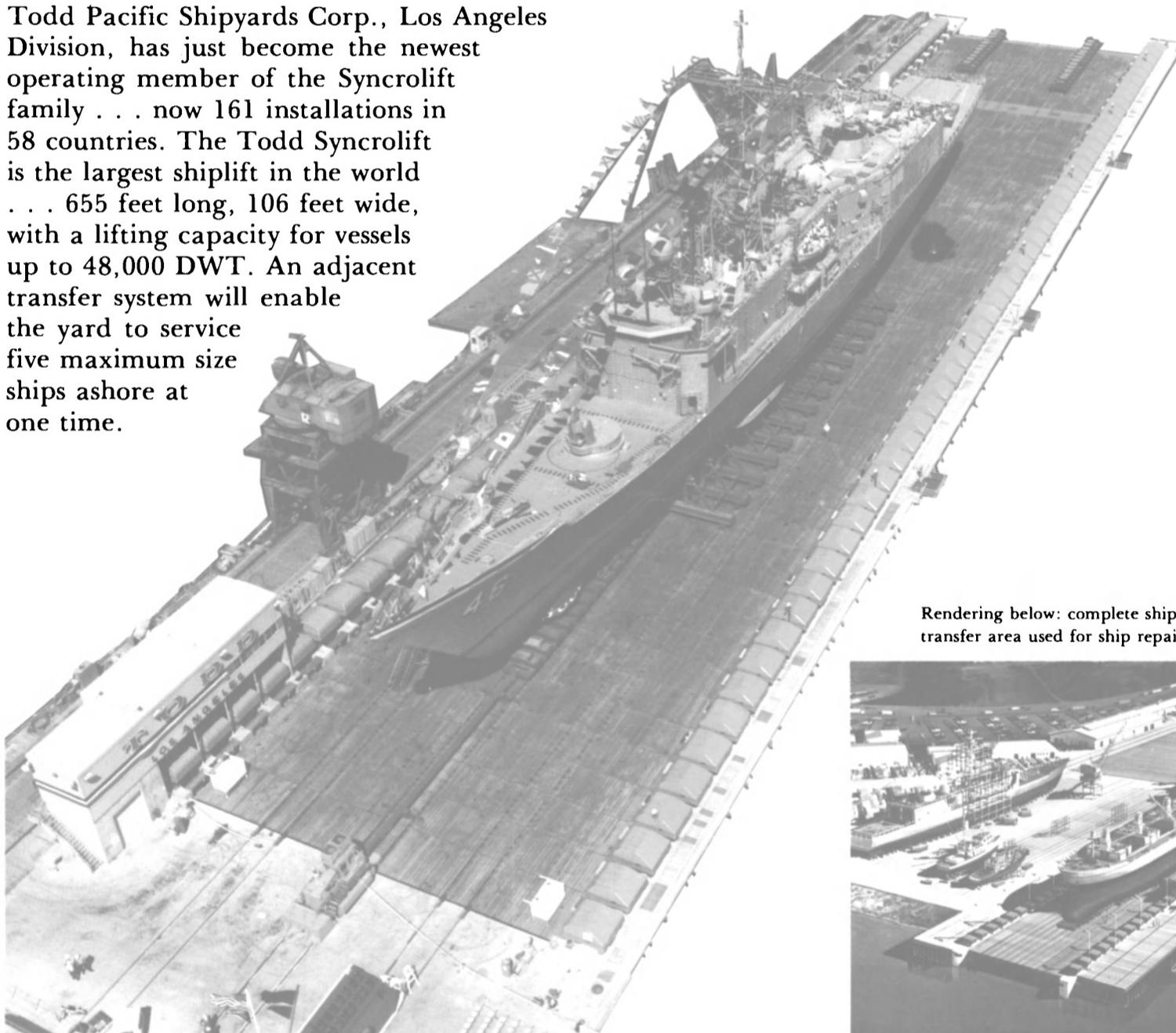
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Photograph above taken March 27, 1984, at Inauguration Ceremony.
Photo by Joseph Ernest, Todd Pacific Shipyard.

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