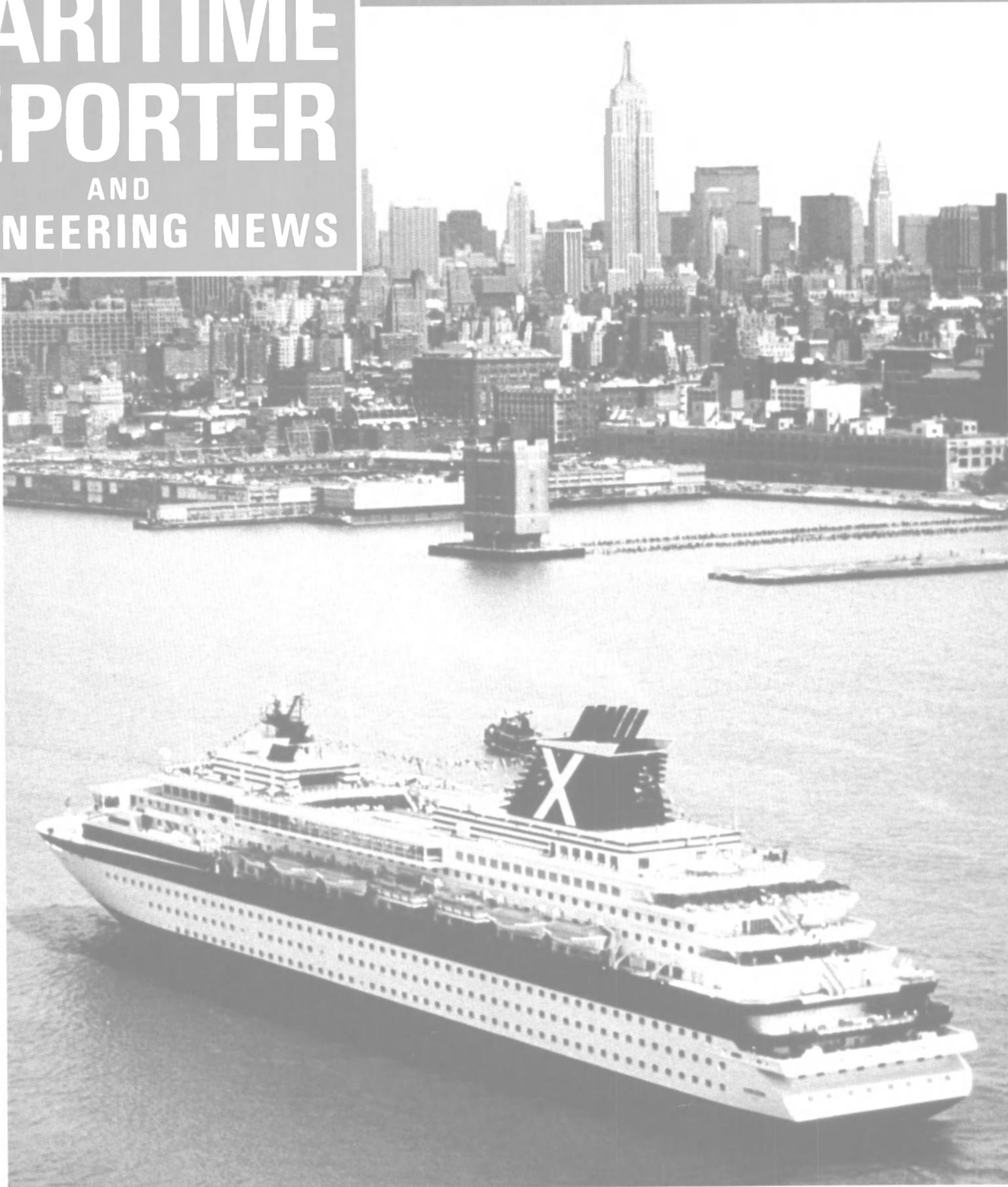


# MARITIME REPORTER

AND  
ENGINEERING NEWS



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EDITION

**JULY 1990**

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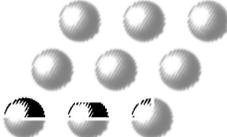
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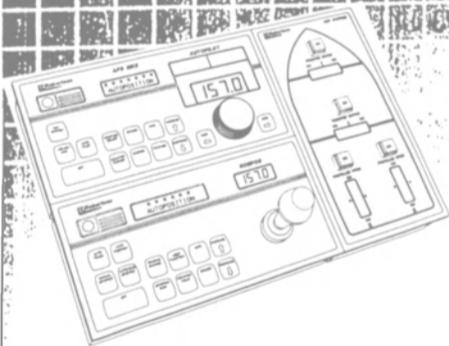
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## ON THE COVER

Chandris's newest "Celebrity," the luxury cruise ship Horizon," in her New York debut. See story on page 11.

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200 Years of Service 31

### Rauma Yards Wins \$125-Million Pact

#### To Build High-Tech Liner

Finnish shipbuilder Rauma Yards Oy was recently awarded a \$125-million contract by a Finnish owner to build a twin-hulled 354-passenger cruise ship based on semisubmersible technology.

The Finnish owner, Diamond Cruises, whose shareholders include Rauma Yards, Mitsui OSK Lines, and Radisson Hotels, a U.S. hotel chain, plans to use the high-tech luxury liner in Caribbean service.

The 18,400-gt cruise vessel, which will have a crew of 170, is scheduled for delivery in the first quarter of 1992. The contract also included options for two more cruise ships.

Rauma Yards is a substantial builder of small- and medium-sized cruise liners. Besides this new order, the yard is building two expedition cruise liners for a West German owner, and has signed a contract with Effjohn International for a cruise liner to replace the fire-damaged Sally Albatross.

For free literature detailing the facilities and services of Rauma Yards,

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Editorial and Executive Offices  
118 East 25th Street, New York, NY 10010  
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Telefax: (212) 254-6271

Publishers: JOHN E. O'MALLEY  
CHARLES P. O'MALLEY  
Editorial Director: CHARLES P. O'MALLEY  
Editor: JOHN R. SNYDER  
Senior Editor: THOMAS H. PHILLIPS  
Consulting Editor: ROBERT WARE  
Associate Editor: CLAUDE CALL  
Advertising Sales Director: JOHN C. O'MALLEY  
Regional Sales Manager: JUDITH A. LEE  
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Production Manager: SHELLY M. RECCHIO  
Circulation Manager: DALE L. BARNETT

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118 East 25th Street, New York, NY 10010  
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### REPRESENTATIVES

U.S. Gulf States MR. JAMES N. McCLINTOCK  
Wheelhouse One Building  
634 Village Lane North, Suite 205  
Mandeville, LA 70448  
Telephone: (504) 626-7990  
Telefax: (504) 624-5163

Italy MR. VITTORIO F. NEGRONE  
Ediconsult Internazionale  
Piazza Fontane Marose, 3-16123 Genova, Italy  
Telephone: (010) 543.659-268.334-268.513  
Telex: 211197 EDINT I  
Editorial Consultant: DR. VICTORIA MUNSEY  
Munsey Consultants  
Strada Del Nobile 59  
10131 Torino, Italy  
Telephone: 11-68-3639 Fax: 11-650-3478

Scandinavia MR. STEPHAN R. G. ORN  
AB Stephan R. G. Orn  
Box 184, S-271 24 Ystad, Sweden  
Telephone 0411-184 00  
Telex: 33335 Orn S Telefax: 411 10531

United Kingdom MR. MICHAEL J. DAMSELL  
Euromedia, Ltd.  
Tern House, Upper West St.,  
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Telephone: 07372 42558 Telefax: 0737 223235  
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Korea MR. CHRIS MAENG  
IPR Int'l PR, INC.  
Yongsan, P.O. Box 100, Seoul, Korea  
Telephone: 273-7765 Telex: MOCNDM K23231

Japan MR. TOSHIO EGUSA  
Publinetwork, Inc.  
C407, 2-22-6, Tsukuda,  
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Singapore MR. VICTOR CHIA  
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122 Middle Road, #07-08  
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	Tanker	140.000 DWT	2
Phiasud	Trawler	33,0 m. Lbp	5
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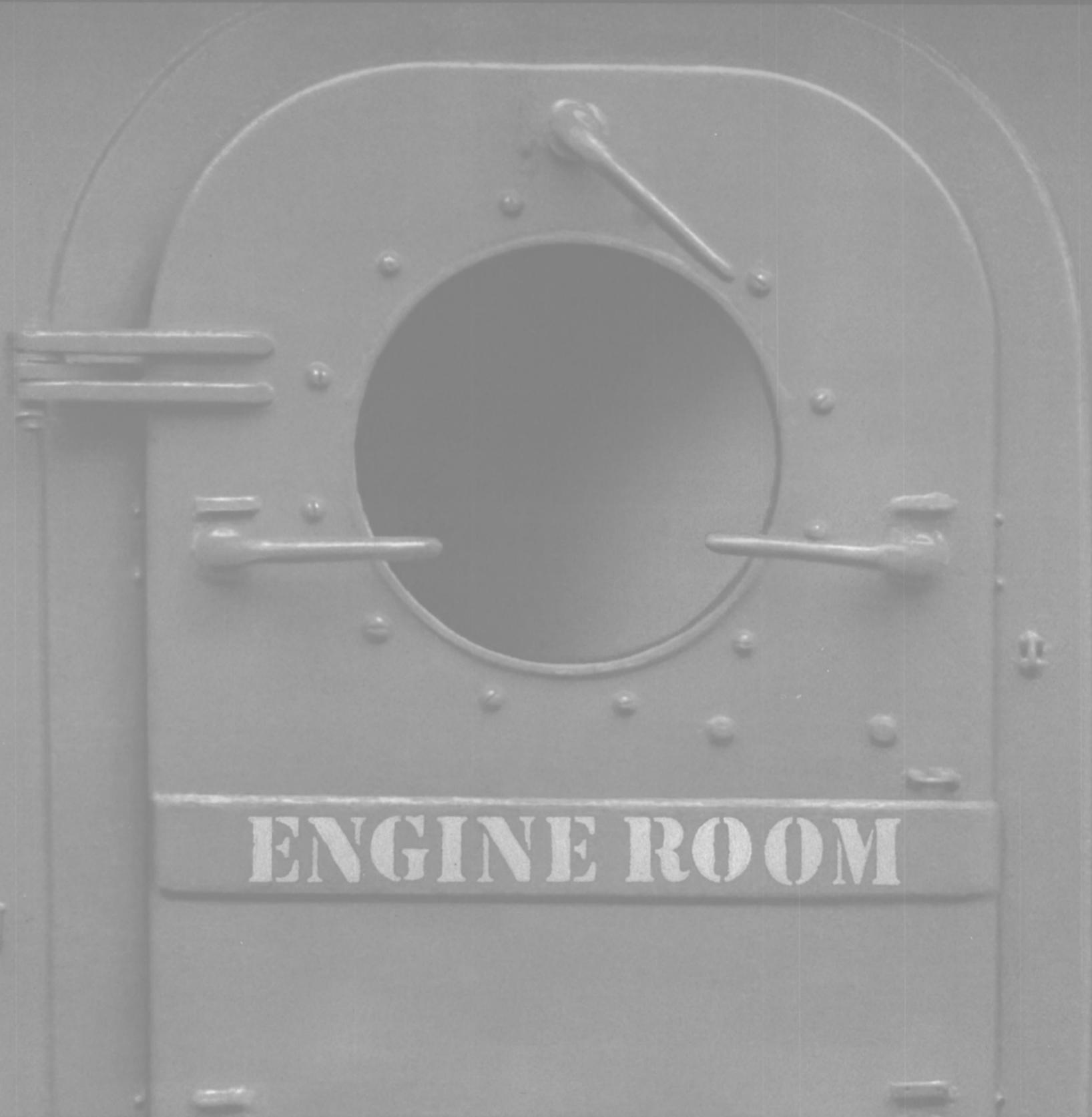
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Chances are, your engine isn't giving you all the power, economy and service it was built to deliver

Why not? Because, with rare exceptions, the marine oil being used wasn't formulated to meet the specific requirements of your engine. Instead, it's a compromise, an oil formulated to meet some of the requirements of the three major makes of diesels used in the United States inland waterway marine trade.

Mobil doesn't think "compromise" performance is good enough. We wanted you to get optimum performance and lower operating costs from either your EMD, your Caterpillar or your Detroit Diesel. The way to achieve that was to create new Optimum Performance Oils for the specific needs of each. Mobilgard<sup>®</sup> 450 for the EMD. Mobilmar<sup>™</sup> 300 for the Caterpillar. Mobilmar<sup>™</sup> 100 for the Detroit Diesel.

**Optimum Performance Mobilgard 450 for the EMD engine.**

Mobilgard 450 is a zinc-free engine oil that will keep EMD silver bearings in like-new condition. Mobilgard 450 also clearly demonstrates that Mobil advanced lubrication technology can significantly lengthen engine life and reduce oil consumption. Because, compared with leading 13 and 17 TBN level competitive oils, Mobilgard 450 provides an 18%-22% saving in oil consumption, 51%-72% better oxidation stability and oil life, and up to 33% better varnish and carbon control. Additionally, it increases load-carrying capability up to 20%.

In actual service, Mobilgard 450's high TBN level provides alkalinity retention surpassing that of competitive 13 and 17 TBN level products.

**Optimum Performance Mobilmar 300 Series for the Caterpillar engine.**

Mobilmar 300 is a high-ash zinc-containing oil formulated specifically to withstand the unusually heavy stresses placed on lubricants used in high-temperature, low-oil-consumption, 4-cycle, highly turbocharged Caterpillar engines. Mobilmar 300 makes Mobil the only oil company offering a separate marine engine oil specifically designed to meet the stringent oil performance requirements of the Caterpillar 3600 Series.

Mobilmar 300 optimizes Caterpillar engine life by assuring outstanding varnish, ring carbon, and piston undercrown deposit control. Both anti-scuff control and oxidation protection have been maximized. Mobilmar 300 also provides very good water separation. Another important characteristic is that it offers a high TBN level with outstanding alkalinity retention.

**Optimum Performance Mobilmar 100 Series for the Detroit Diesel engine.**

Mobilmar 100 is a specially formulated low-ash monograde marine engine oil with optimum film thickness to provide maximum protection in heavy-duty 2-cycle Detroit Diesels. As a result, its slipper bushing and piston liner wear protection are outstanding. Mobilmar 100 also provides these higher-speed engines with excellent valve train antiwear performance.

Additionally, Mobilmar 100 extends oil service life and maximizes the periods between overhauls. It also provides high-temperature detergency with high dispersancy during intermediate, cyclic and high idling service, thereby helping control soot and sludge. Mobilmar 100 has outstanding water separation capabilities both in storage and during operation. It has a moderate TBN level, and its alkalinity retention is exceptional.

For more information on Mobil marine oils, call 1-800-662-4525.

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**Mobil<sup>®</sup>**

**If we can't save you money we don't deserve your business.**

## Pacquet Purchases Two Cruise Lines For \$100 Million

In accordance with plans to become a major force in the passenger cruise industry, Pacquet Cruises recently announced the acquisition of Ocean Cruise Line and Pearl

Cruises from The 2000 Corporation, Montreux, Switzerland.

Price for the sale, according to reports, was close to \$100 million.

The Paris-based publicly held firm of Chargeurs SA, with assets close to \$2 billion, owns 50 percent of Pacquet, with the other 50 percent being owned by Accor, the hotel firm with 850 properties

worldwide, including the Novotel and Sofitel chains.

Under terms of the transaction, Pacquet obtains the 3,750-gross-ton, 276-passenger Ocean Islander, the 8,469-ton, 550-passenger Ocean Princess and the 12,475-ton, 725-passenger Ocean Pearl.

## Chevron To Invest \$380 Million In Gulf Of Mexico Exploration

A spokesman for Chevron USA has said that the company plans to spend \$380 million this year—five percent more than last year—on oil and gas activity in the Gulf of Mexico.

According to **Claude Fiddler**, the general manager of production, that amount will probably grow again in the near future because, in the search for new reserves, Chevron is planning on executing some of its drilling efforts in some of the deeper parts of the Gulf, including the Green Canyon.

Mr. Fiddler also noted that Chevron will be drilling, mostly for natural gas, in as much as 2,600 feet of water next year, and that the company is already searching the market for the large semi-submersible rigs necessary to complete the job.

## Sea-Land Buys Two Ships From MarAd

Edison, N.J.-based Sea-Land Service Inc., has purchased two LASH vessels from the U.S. Maritime Administration, at a total cost of \$16.2 million.

Officials at Sea-Land have said that the purchase will allow the company to double its service to Hawaii.

Sea-Land has also expressed an interest in using the two 893-foot vessels to increase service across the Pacific. However, it has not been decided whether Sea-Land will integrate the ships into existing services or create a new Pacific service.

The company plans to have the vessels converted and has put the job out to bids. Following conversion the ships will have a 1,650-TEU capacity and should be able to attain a service speed of 22½ knots.

## Wyle Laboratories Names Navid General Manager, El Segundo Operations

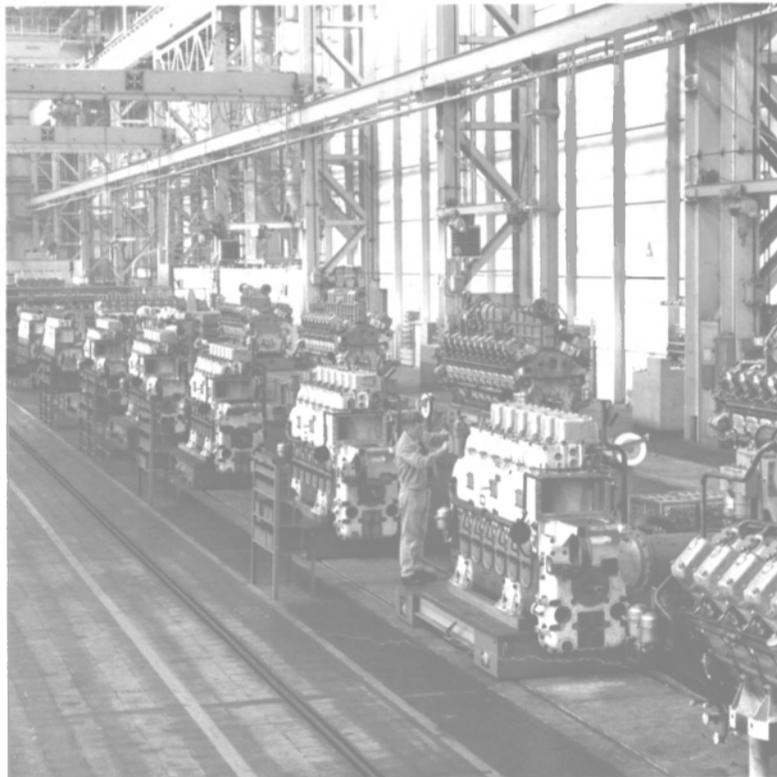
Dr. **Mehdi Navid** has been promoted to the post of general manager, El Segundo Operations of Wyle Laboratories' Scientific Services & Systems Group. The announcement was made by **C. D. Yiakas**, group vice president—Western Test Operations.

In his new position, Dr. Navid will be responsible for all engineering and testing operations in El Segundo. He reports directly to Mr. Yiakas. Dr. Navid succeeds Mr. **Fred Ichinaga**, who recently retired.

Wyle Laboratories is a major supplier of research, engineering and testing services to the aerospace, defense and energy industries. The company is also one of the nation's leading marketers of high-technology electronic components and computer systems.

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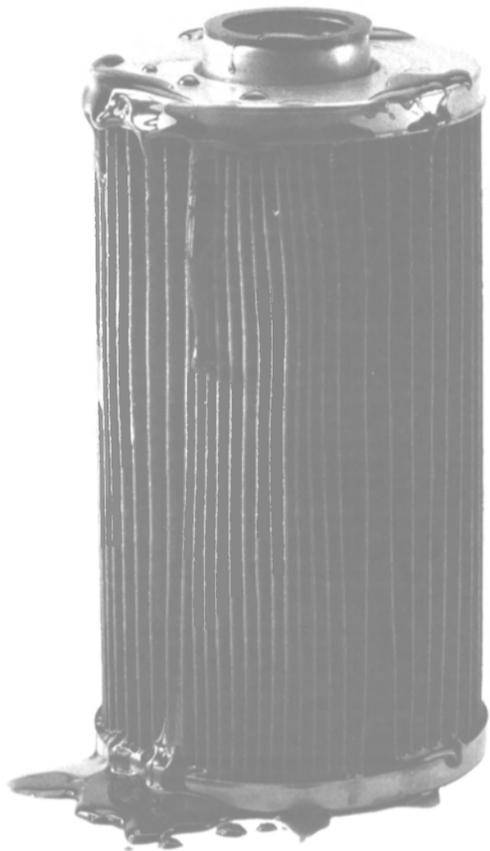
## Taiwan Shipowner Orders Five New Containerships From Japanese Dockyard

Evergreen, the Taiwan shipowner, has confirmed placing orders for five new containerships, which are said to be among the world's largest. Onomichi Dockyard in Japan will build the ships, with deliveries ex-

pected to begin in July 1992.

A spokesman for Evergreen said the company's initial intent is to use the 4,500-TEU post-Panamax vessels in its trans-Pacific operations.

At present, Evergreen operates six 2,728-TEU-capacity ships in its weekly Taiwan-U.S. West Coast service. Reports indicate that these six might be completely replaced by the five new containerships.



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Stop fungi and other microorganisms from growing in your fuel tank and filters with BIOBOR JF.

Formulated especially for diesel and jet fuel. BIOBOR JF prevents growth of slime-producing fungi that clog filters and interfere with engine function. It won't harm fuel system parts, or adversely affect fuel performance.

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## Wartsila Diesel Announces Executive Appointments



Clas-Eirik Strand



Jeffrey W. Eckel



Torsten J. Astrom



Daniel Kabel



Karl Yannes

Wartsila Diesel, Chestertown, Md., recently announced the following executive appointments:

**Clas-Eirik Strand** has been appointed president of Wartsila Diesel, Inc., the North American subsidiary of Wartsila Diesel International Ltd., of Helsinki, Finland. He will manage all Wartsila Diesel activities in North America, Central America, and the Caribbean Basin, from the new company headquarters in Chestertown, Md.

**Mr. Strand** has been with Wartsila Diesel since 1975, and most recently served as vice president of Wartsila Diesel in Finland. He continues as head of their international management team responsible for diesel power plants worldwide.

**Jeffrey W. Eckel** has joined Wartsila Diesel as vice president and chief financial officer. **Mr. Eckel** has a background in investment banking and management consulting to the United States electric power industry. His experience in third-party financing, leasing, and merger and acquisition financing will be of great value in obtaining and structuring appropriate financing for projects that include Wartsila Diesel engines.

**Torsten J. Astrom** has been appointed vice president-power systems. He will be responsible for all land-based power systems and power

plant activities in North America, Central America, and the Caribbean Basin.

**Mr. Astrom** has held a variety of sales and marketing positions within Wartsila Diesel since joining the company in 1980.

**Daniel Kabel** has been appointed vice president-diesel service. He will be responsible for product support and service for North America, Central America, and the Caribbean Basin. The five regional service offices will report to **Mr. Kabel** at the company's headquarters in Chestertown.

**Mr. Kabel**, a graduate of the U.S. Merchant Marine Academy, is a member of the Wartsila Diesel international management team responsible for diesel service.

**Karl Yannes** has been appointed vice president-marine engines for Wartsila Diesel, Inc. **Mr. Yannes**, who will also be located in Chestertown, will be responsible for all Wartsila Diesel marine marketing activities in North America, Central America, and the Caribbean Basin.

**Mr. Yannes**, a 1977 graduate of the U.S. Merchant Marine Academy, has held a variety of marketing and sales positions at Wartsila Diesel since joining the company in 1983.

### Murphy Mfg. Offers Full-Color, 12-Page Marine Equipment Catalog

Murphy Mfg. of Tulsa, Okla., is offering a full-color, 12-page marine equipment catalog titled "Monitoring and Protection for Marine Engines and Equipment," which displays photographs, drawings, and descriptions of over 60 products.

A representative selection of Murphy Swichgag®s and Selectronic® components are shown. These instruments and controls are designed for the protection and automation of the engines, electric motors, pumps, and generators on vessels.

For more information and free copies of the marine equipment catalog from Murphy Mfg.,

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## Chandris Celebrity's 'Horizon,' Built By Meyer Werft, Makes Her New York Debut

Chandris Celebrity Cruises' newest addition, the 46,811-grt luxury liner Horizon recently made her debut in New York City following her christening and subsequent voyage from Meyer Werft's shipyard in Papenburg, West Germany. Following her New York debut, the Horizon set sail on her inaugural cruise to Bermuda.

The \$185-million Horizon along with her sister ship, the Zenith, currently under construction at Meyer Werft, are the yard's largest new-buildings and the largest passenger ships ever built in the Federal Republic of Germany.

The 4,300-dwt Horizon has an overall length of about 681 feet, molded breadth of 95 feet and draft of 23.6 feet.

The 12-deck ship is propelled by a father-and-son four-engine plant

consisting of two MAN B&W 9 L 40/54 "father" engines with an output of 5,994 kw at 514 rpm each and two MAN B&W 6 L 40/54 "son" engines, each developing 3,996 kw at 514 rpm. The engine output is being transmitted via double reduction gears with integrated lamella couplings to the controllable pitch propeller plants. The main and auxiliary engines are designed to operate on heavy fuel oil IFO 600.

To insure an optimum maneuverability, the Horizon was fitted with two controllable pitch propeller plants, two bow thrusters, one stern thruster and two flap rudders which are operated by a joystick.

The stabilizers, which are absolutely necessary for a cruise vessel, are capable of reducing the rolling motion by 90 percent at a speed of 19.5 knots.



The 12-deck, MAN B&W-powered Horizon plies the waters of the Hudson River assisted by Moran tugs in her New York debut.

The 1,354-passenger Horizon was built in compliance with the rules and regulations of the classification society Lloyd's Register of Shipping to the class notation + 100 A1 Passenger Ship + LMC, UMS World-wide Unrestricted Service.

The Liberian-flagged vessel has 533 outside and 144 inside cabins. She has been designed with five decks, 4, 5, 6, 9 and 10, for cabin

accommodations so that they are completely separated from public rooms. There are a total of 14 public rooms covering an area of about 6,100 square meters and arranged on decks 4, 5, 7, 8, 11 and 12.

For free literature giving complete details on the facilities and capabilities of Meyer Werft,

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## ELECTRONICS UPDATE

### Furuno Introduces New Autopilot, Compact, Lightweight Gyrocompass, And 10-Inch Color Video Sounder

Furuno U.S.A., San Francisco, Calif., recently announced the introduction of several new products.

Furuno's new FAP-55 microprocessor-controlled autopilot features five operating modes, a large easy-to-read LCD display, built-in dodge steering, heading input from magnetic compass, gyro, or fluxgate sensor and optional dual station with full function remote. All systems inputs are made via sealed touchpads and the large backlit LCD screen shows full digital system information and mode selected; an analog portion of the display shows rudder direction indicators and operator's choice of course deviation, rudder angle or cross-track error.

The new GY-700 gyrocompass is a high-precision, reliable instrument for marine navigation. The self-contained master compass is compact and lightweight enough for installation on almost any vessel, from workboat to megayacht. The combined advanced electronic technology and precision mechanical design result in a gyro with greatly reduced settling time: 30 minutes for  $\pm 1$  percent accuracy, and 60 minutes for  $\pm 0.5$  percent accuracy once estimated latitude and heading are entered.

Furuno's new FCV-271 is a compact, simple-to-operate color video sounder designed for sport and commercial fishermen. It features a bright, high resolution 10-inch CRT that displays fish and bottom echoes in eight vivid colors to



Furuno's FCV-271 10-inch single frequency color video sounder.

depths of 6,000 feet. Output power is 1,000 W rms, with choice of 28, 50, 88, or 200 kHz operating frequency.

Standard performance features, all selected from convenient front panel controls, include user's choice of range scale, six zoom and bottom lock ranges, variable range marker, surface clutter control, switchable noise limiter, signal level, blue/dark blue/black background color, fish/bottom/temperature alarm, and automatic bottom tracking.

For more information on the new FAP-55 autopilot from Furuno,

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For free literature on Furuno's GY-700 gyrocompass,

Circle 38 on Reader Service Card

For literature giving complete information on the new 10-inch color video sounder from Furuno,

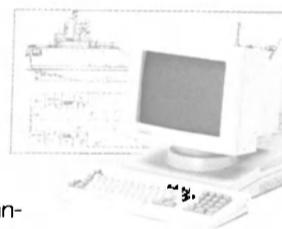
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## HOW WE CAN GIVE YOU MORE ILLUMINATION WITH FEWER LIGHTS.

Avoid the expenses of installing extra fixtures, as well as the equipment needed to operate them, with the computer-aided lighting layout (CALL) program from Phoenix. CALL helps develop ideal lighting systems by computing the precise number, type and mounting locations of fixtures needed for your vessel. Select from more than fifty 35-1000 watt incandescent, fluorescent

and HID lights, including hazardous location models. Also, Phoenix can modify fixtures for special applications. From fishing boats to aircraft carriers, Phoenix has lights that are

right for your vessel. For a free brochure, contact: PHOENIX PRODUCTS CO., INC., 6161 N. 64th St., Milwaukee, WI 53218; Phone 414-438-1200; TELEX 910-262-3389; FAX 414-438-1330.



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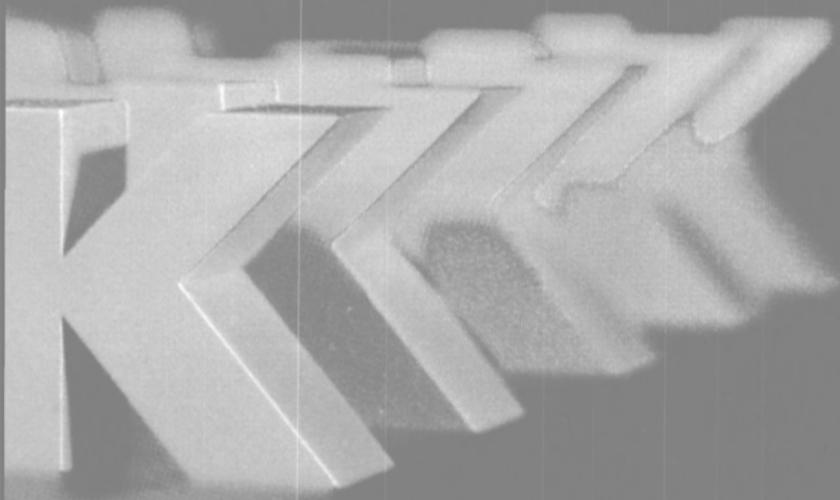
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## ELECTRONICS UPDATE



Radio Holland's Datamation is a complete integrated ship management system. One navigator can control and operate all the nautical and technical equipment on board.

### Radio Holland's Datamation: A Complete Integrated Ship Management System

—Free Literature Available—

Radio Holland USA, Houston, Texas, part of the Radio Holland Group, offers a full package of service and support to the shipping industry. This also means that Radio Holland helps to ensure optimal, efficient and safe navigation.

With the introduction of Datamation, an integrated management system, the Radio Holland Group has provided shipping with a bridge of the future.

From this fully integrated bridge, it is possible for one navigator to control and operate all the nautical and technical equipment on board.

The Datamation bridge interfaces various components used in navigation, control and communication. In other words, Datamation is a total system enabling the navigator to interfere in the vital functions of all the navigation and engine room equipment on board. The navigator can operate the internal and external communication systems on board.

With dual construction, two navigators can, if desired, carry out the same activities on both sides of the ship's control module.

The Datamation system is primarily set up from the main groups, navigation, communication, engine room control and cargo and ballast control.

The system interfaces equipment of most leading manufacturers to form one whole entity.

In addition to the advantages of universal interfacing and man-power savings, there are five aspects which deserve special attention: safety, flexibility, electronic chart, easy installation and the future.

The fact that all equipment on board required for safe voyage can be controlled from the integrated bridge certainly means increased safety on board. The navigator is now able to give his undivided attention to supervising and maintaining safety during the voyage.

In addition, since the system is

ergonomically designed, there is less chance of physical fatigue for the navigator. Also, the introduction of an electronic chart or Anschutz automatic chart plotter means that there is no time wasted at the chart table.

The Datamation system is flexible because it can be assembled completely to the customer's requirements. Other key features include built-in safety provisions for propulsion control, as well as the ability to carry out cargo and ballast control with the use of a PC.

A notable development is the electronic chart. The Radio Holland Group has also been involved in the future alternative to conventional sea-charts, also known as the "electronic chart display information system." In the near future, the electronic chart will completely replace the conventional sea chart, according to Radio Holland.

The Datamation concept from Radio Holland has in fact provided a bridge ready for the future. It provides efficient ship management, which is becoming more and more valued by shipowners.

Furthermore, future requirements, such as a black box, can be easily integrated into the Datamation bridge.

Besides its main headquarters in Houston, Radio Holland USA has service and support depots located in Panama City and Ft. Lauderdale, Fla., Norfolk, Va., Long Beach and Oakland, Calif., Kenilworth, N.J., Seattle and Vancouver, Wash., Mobile, Ala., New Orleans, La. and Corpus Christi, Texas. Additionally, the Radio Holland Group also has a member branch, Radio Holland Canada, located in North Vancouver, British Columbia.

For a free color brochure fully detailing Radio Holland's Datamation, the integrated ship management system,

Circle 64 on Reader Service Card

### McDermott Awarded \$27-Million Exxon Contract For Offshore Platform

McDermott Marine Construction, a major operating unit of McDermott International Inc., has been awarded a contract by Exxon Company U.S.A. valued at approximately \$27 million. The contract calls for the fabrication and installation of an 18-slot drilling/production platform for offshore Louisiana. The platform, part of Exxon's Alabaster development, will be installed in the Gulf of Mexico in 468 feet of water. Completion of this work is scheduled for the fall of 1991.

The 4,650-ton jacket will be the first that McDermott Marine Construction will fabricate in its Harbor Island Yard in Corpus Christi, Texas. Jacket components, piles and conductors will be fabricated at McDermott's facility in Amelia, La., with actual assembly scheduled to begin at Harbor Island later this fall. The 1,850-ton deck and modules will be constructed in McDer-

mott's New Iberia, La., fabrication yard.

McDermott International, Inc., is a leading worldwide energy services company. The company and its subsidiaries manufacture steam-generating equipment, defense products, and tubular products. They also provide engineering and construction services for industrial and utility facilities onshore, and the oil and gas industry offshore.

For free literature containing full information on all of McDermott Marine services,

Circle 95 on Reader Service Card

### NABRICO Delivers First Of Five Chemical Barges

The Nashville Bridge Company (NABRICO), Nashville, Tenn., has delivered the first of five 30,000-barrel double-skin chemical barges to Maryland Marine, Inc. The chemical barge, MMI 601, along with her sisters will be placed on a long-term charter to the company.

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## Avondale To Bid On Construction Of World's Largest Passenger Ship

U.S. shipbuilder Avondale Industries, Inc., New Orleans, La., has signed an agreement with the World City Corporation, Oslo, Norway, to prepare and submit a firm offer and delivery schedule for the construction of what would be the world's largest cruise ship.

The 250,000-gt, 5,600-passenger vessel, called the Phoenix World City, was conceived and developed by **Knut Utstein Kloster**, chairman of the World City Corporation. The Phoenix World City would be three times larger than the largest cruise ship operating today, and if constructed in the U.S., would be the first major passenger ship built by a U.S. yard in more than 30 years.

**Albert L. Bossier Jr.**, chairman and chief executive officer of Avondale, said: "Avondale is pleased to be included as part of the team working to bring this historic project to completion. Our company believes that its modular construction techniques and productive labor force will enable it to submit a firm offer demonstrating our capability of producing a vessel of this scale and complexity on terms which will be competitive in the world market.

"Avondale has participated in innovative construction projects for ships as well as large scale industrial projects, and the Phoenix World City project is a continuation of this type of innovative effort."

The Phoenix World City project has been in design and development for more than five years under the leadership of Mr. **Kloster**, who was founder and chairman of the group now known as Kloster Cruise Limited (owners of Norwegian Cruise Line, Royal Viking Line, and Royal Cruise Line). In that capacity, Mr. **Kloster** initiated the acquisition of the S/S France and her conversion to the highly successful S/S Norway.

Mr. **Kloster** stated: "The agreement with Avondale represents an important step in the development of Phoenix World City. It provides for performance of the extensive shipyard work on which any firm offer for construction of a project of this magnitude must be based, and, even more importantly, it now assures that World City will receive a timely offer and fixed delivery schedule, prerequisites for completion of financing arrangements."

The Phoenix World City, which is scheduled to enter service in 1994,

will be almost a quarter of a mile long, with a maximum width nearly the length of a football field. One of the many distinctive features of the ship will be three hotel towers containing most of the guest accommodations, which rise from a three-deck "downtown" area featuring streets and avenues lined with restaurants and cafes, shops, and galleries.

The "floating city" will also feature a large marina within the hull, reached through massive portals in the stern of the ship. Four 400-passenger daycruisers—ships themselves—dock inside the marina and will be deployed at high speeds to and from ports and a variety of destinations.

**Ron McAlear**, project leader of Avondale's Phoenix World City team, cited a number of factors that have contributed to the company's ability to bid competitively for this project even though construction of large passenger cruise ships has for many years been the exclusive preserve of overseas shipyards.

Among the factors cited by Mr. **McAlear** are: an extensive Avondale program which brought about a transfer of up-to-date technology and methodology from abroad; major investment in capital equipment; wage rates that are competitive with those in leading foreign shipyards; the low dollar relative to currencies of major shipbuilding nations; long expertise in modular con-

struction acquired in offshore, naval, and other projects; and development of enhanced construction techniques for sophisticated Navy ships.

Mr. **McAlear** added that, if the Avondale bid is successful, the construction of Phoenix World City in the U.S. would generate substantial work not only for ship construction personnel, but for businesses and workers across the country.

For free literature detailing the shipbuilding facilities of Avondale Industries,

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### Free Color Brochure Details Lonseal Flooring For Marine Applications

Lonseal, Inc., of Carson, Calif., has issued a new brochure illustrating their complete line of vinyl resilient sheet flooring for all applications.

The 12-page brochure gives an excellent overview of the colors, styles and textures that are available, and gives helpful suggestions about specific applications for each design. It also provides specific technical data regarding hardness, strength, fire retardancy and resistance to staining or exposure to various substances.

For a free copy of this brochure, Circle 109 on Reader Service Card

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## Eckermann Appointed President Of Marathon LeTourneau Marine



Dan C. Eckermann

Dan C. Eckermann has been named president of Marathon LeTourneau Marine Company, a division of Marathon LeTourneau Company. Mr. Eckermann will be located in Houston at the company's marine headquarters.

The announcement was made by J. Earl Beckman, president and chief executive officer of Marathon LeTourneau Company.

Mr. Eckermann succeeds William K. Trimble, who has resumed the duties of president at the company's Marine Division in Vicksburg, Miss. There, Mr. Trimble will be responsible for all offshore construction work, including the recently contracted mobile jack-up rig for a Norwegian company.

A native of Bellville, Texas, Mr. Eckermann comes to Marathon from Pennzoil Products Company, where he had been the vice president of a Pennsylvania manufacturing operation. Prior to joining Pennzoil, Mr. Eckermann was associated with Marathon Manufacturing, Morco Division, and Union Carbide, where he served in various manufacturing and engineering management positions.

## OWWA Signs Accord With Unitor-Magsaysay —Color Brochure Available

Responding to the need to enhance the welding skills of Filipino seafarers, the Philippine governmental agency Overseas Workers Welfare Administration (OWWA) has formally signed an agreement with Magsaysay Lines Inc. to make funds available to support seafarers training at the Unitor-Magsaysay Maritime Training Center in Manila.

The Unitor-Magsaysay Maritime Training Center offers six different maritime welding courses which are highly individualized with hands-on training in various welding techniques. Steps are now being taken to extend the training center's activities to also cover training in the other fields covered by Unitor Ships Service AS.

Unitor has a network of 54 branch offices and 201 agents covering 830 ports worldwide servicing the international shipping and shipbuilding industries.

For further information and free literature from Unitor,

Circle 18 on Reader Service Card

## Singmarine Wins \$16 Million Contract For New Chemical Tanker

Singapore shipbuilder Singmarine Industries Limited, through its ship repair and shipbuilding division, Singmarine Dockyard & Engineering Pte. Ltd., has been awarded its first Italian newbuilding contract, worth \$16.2 million.

The order calls for the construction of a sophisticated 9,300-dwt

chemical tanker for Mediterranea Di Navigazione, and is to date the largest single vessel contract received by Singmarine Dockyard.

When completed, the 407-foot long tanker will have a cargo capacity of 11,000 cubic meters and will be capable of storing three different types of chemicals. Its center and side tanks can also accommodate chemicals up to IMO II and IMO III classes, respectively. Delivery of the vessel is scheduled for mid-1991.

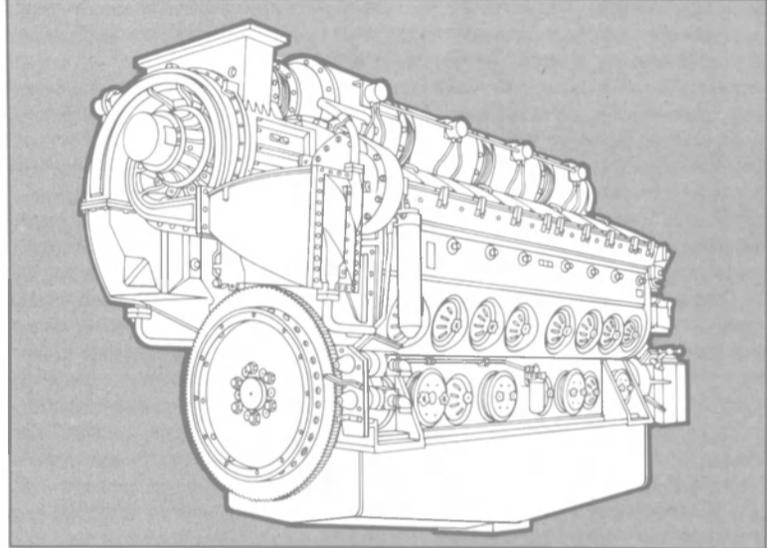
Singmarine Dockyard has recent-

ly acquired the 35-acre yard in Jurong, formerly owned and operated by Marathon LeTourneau. Development of this facility, designated the Main yard, is well underway. Upon its completion, Singmarine will have the capacity to build large, more sophisticated ships up to 490 feet.

For literature containing complete details on the services offered by Singmarine dockyard,

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## PROPULSION UPDATE

### Hamilton Introduces Advanced Water Jet For Wide Range Of Vessels

Founded over 30 years ago, C.W.F. Hamilton & Co. Ltd. of New Zealand has introduced a new water jet for use aboard a wide range of vessels in both the commercial and passenger boat markets.

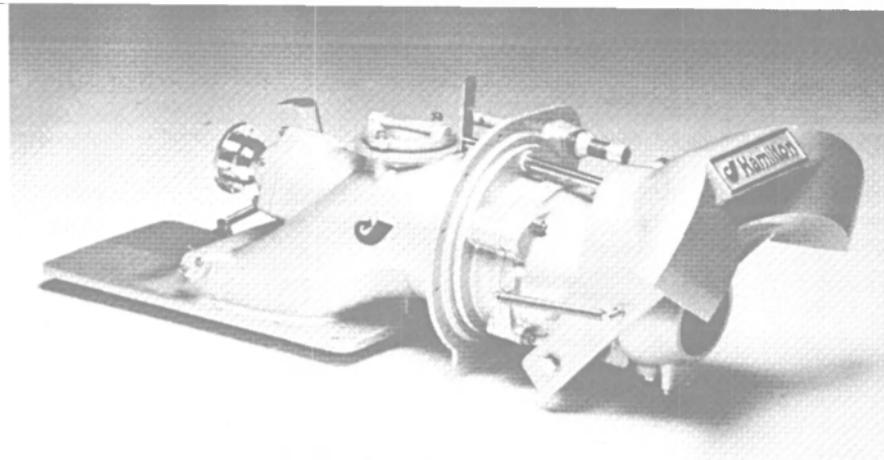
The Hamilton Model 211 has been developed through the technology of computer-aided design to provide a high efficiency propulsion system for a wide range of commercial and pleasure craft.

Of heavy duty construction for trouble-free service under continuous use conditions, the 211 unit has been developed primarily for coupling to ultra high rpm diesel engines up to 200 hp or big block

gasoline engines in the five to eight liter range.

Of similar configuration to other highly successful new generation Hamilton water jets, the 211 shares the same split duct reversing deflect for powerful astern thrust, integral corrosion protection and "T3" steering system for precise, powerful control. Installation is simplified as an aluminum intake base is supplied, either for aluminum or GRP/wooden hulls. The GRP version eliminates the need for builders to mold a thick GRP block.

Extensively tested in both Hamilton's static test rig and test craft, the 211 unit is said to be an ideal



The new Hamilton Model 211 was designed to be used with high rpm diesel engines.

propulsion unit for both high speed workboats and large pleasure craft and small commercial passenger craft where operations require proven performance and reliability.

For example, in displacement speed craft, with maximum speeds of up to 10 knots, such as a pilot boat with a 6-ton displacement, a single jet arrangement can be used, with a maximum recommended power input of 60 kw (80 hp). A double jet arrangement can be utilized in 13-ton-displacement scalloper, while a triple jet arrangement would suffice in a 22-ton-displacement workboat. For displacement speed hulls, speed depends more efficient hull shape than displacement or input power. The displacements in the examples provided can be at least doubled, according to Hamilton, for long narrow, easily driven craft.

New generation Hamilton water jets reflect the latest technological

advances. Computer-aided impeller designs, tested by using a closely monitored closed circuit water tunnel, give high propulsive efficiencies.

Inboard mounted, near the stern, Hamilton water jets draw water through an intake duct and debris screen, fitted flush to the bottom of the hull.

Normally directly driven via a short slip-jointed universal drive-shaft coupled to the engine flywheel adaptor, Hamilton water jets are available in models compatible to most popular high-speed marine diesel engines up to 1,400 hp.

All units are supplied factory tested, assembled as a complete package including integral steering and reverse systems, reflecting simple low-cost installation.

For a free brochure fully detailing the Model 211 Hamilton water jet, **Circle 89 on Reader Service Card**

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### Allison-McDermid Gets \$180-Million Order For 3 Drill Rigs

Capital Maritime Corporation, of Greenwich, Conn., has placed an order with the Allison-McDermid Yard, located in Brownsville, Texas. The \$180-million order, for three harsh-environment drilling rigs, includes an option for three more jack-ups.

For the project, Allison-McDermid has come up with a new design of cantilever jack-up, which has been described as a state-of-the-art unit, designed to operate in depths approaching 300 feet. Capital plans to call the new rig the Optima 300 class.

The specifications called for in the Optima's design will enable the rigs to meet standards for high-pressure drilling operations in the North Sea. The first rig's scheduled delivery date is in April 1992; the second one in October of that year and the third in April of 1993.

For further information on construction services available from Allison-McDermid,

**Circle 3 on Reader Service Card**

### Hyundai To Build Three Containerships For CMB

Hyundai Heavy Industries, South Korea, has received an order to construct three 2,000-TEU container-

ships for Belgian liner operator CMB NV.

According to a spokesman for CMB, the vessels will be 594 feet long and attain a service speed of 18 knots. While the spokesman would not comment on the value of the contract, speculation in the market put the cost at nearly \$120 million.

For more information about facilities and services available from Hyundai Heavy Industries,

**Circle 4 on Reader Service Card**

### Sigma Offers New Information Guide To Antifouling Coatings

In order to make the decision about antifouling products easier, Sigma Coatings has produced the Sigma Antifouling File. It explains the difference between the three Sigma lines of antifouling—Sigma-plane, Sigma Pilot and Sigma Classic—and also details the new "Ecol" range of tin-free antifouling, which can allow vessels to operate in areas where the use and application of antifouling containing tin are prohibited.

The file contains a series of information-packed fact sheets, and contains everything necessary to help make the right choice of Sigma antifouling product.

For a free copy of the Sigma Antifouling information file,

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# POWERED BY THE REALLY RELIABLE ENGINE

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## Halter Marine To Convert Supply Vessel For EPA Under \$4.2-Million Pact

The Maritime Administration has announced the recent award of a \$4.2-million contract to Halter Marine, Inc, Gulfport, Miss., a member of the Trinity Marine Group.

Under the terms of the contract, Halter will convert the Marsea

Fourteen, an offshore supply vessel owned by the Environmental Protection Agency, into a research vessel. MarAd will supply technical assistance.

Among the projects included in the conversion are the removal of drilling mud tanks and replacing them with scientific laboratories, the addition of new crew quarters, expansion of the superstructure to provide more working spaces, and

installation of new scientific and navigational equipment.

Upon completion, the ship, to be renamed the R/V Lake Guardian, is scheduled for use in the Great Lakes region, operating out of Bay City, Mich. The Lake Guardian will be the third largest vessel operated by the EPA.

For more information on services available from Halter Marine,

Circle 124 on Reader Service Card

## Kloster Orders \$80-Million Cruise Ship From Schichau

The Schichau Seebeckwerft yard in Bremerhaven, West Germany, has received an order from Kloster Cruise, Ltd., for a 10,000-gross ton, 212-passenger luxury cruise ship. According to a representative of Kloster, all of the ship's cabins will be outside staterooms. The \$80-million ship will fly the Royal Viking Line pennant. RVL hopes that the new vessel's ability to call at the smaller, more exotic ports will give the line a larger share of this increasingly competitive market.

Schichau Seebeckwerft officials have scheduled the delivery for February of 1992.

For more information about facilities and services available from Schichau Seebeckwerft,

Circle 104 on Reader Service Card

## Magnavox Introduces New Integrated GPS/Transit Satellite Navigation System



The Magnavox MX 4102GPS

Magnavox has announced the introduction of an integrated GPS/Transit satellite navigation system for the commercial marine market.

The new MX 4102GPS is a complete dual navigation system, allowing users to make use of both the existing Transit navigation system and the as-yet-unfinished Global Positioning System (GPS). The GPS capability is provided by Magnavox's six-channel MX4200 GPS receiver module, interfaced with the MX 4102 SatNav.

The combined GPS/Transit package will provide users with an optimal worldwide navigation aid during the transition period while GPS is being deployed. The MX 4102GPS provides a constant update of GPS-derived position whenever signals from a sufficient number of GPS satellites are available. At all other times, the system automatically switches over to the Transit system, updating position between Transit fixes with automatic dead reckoning.

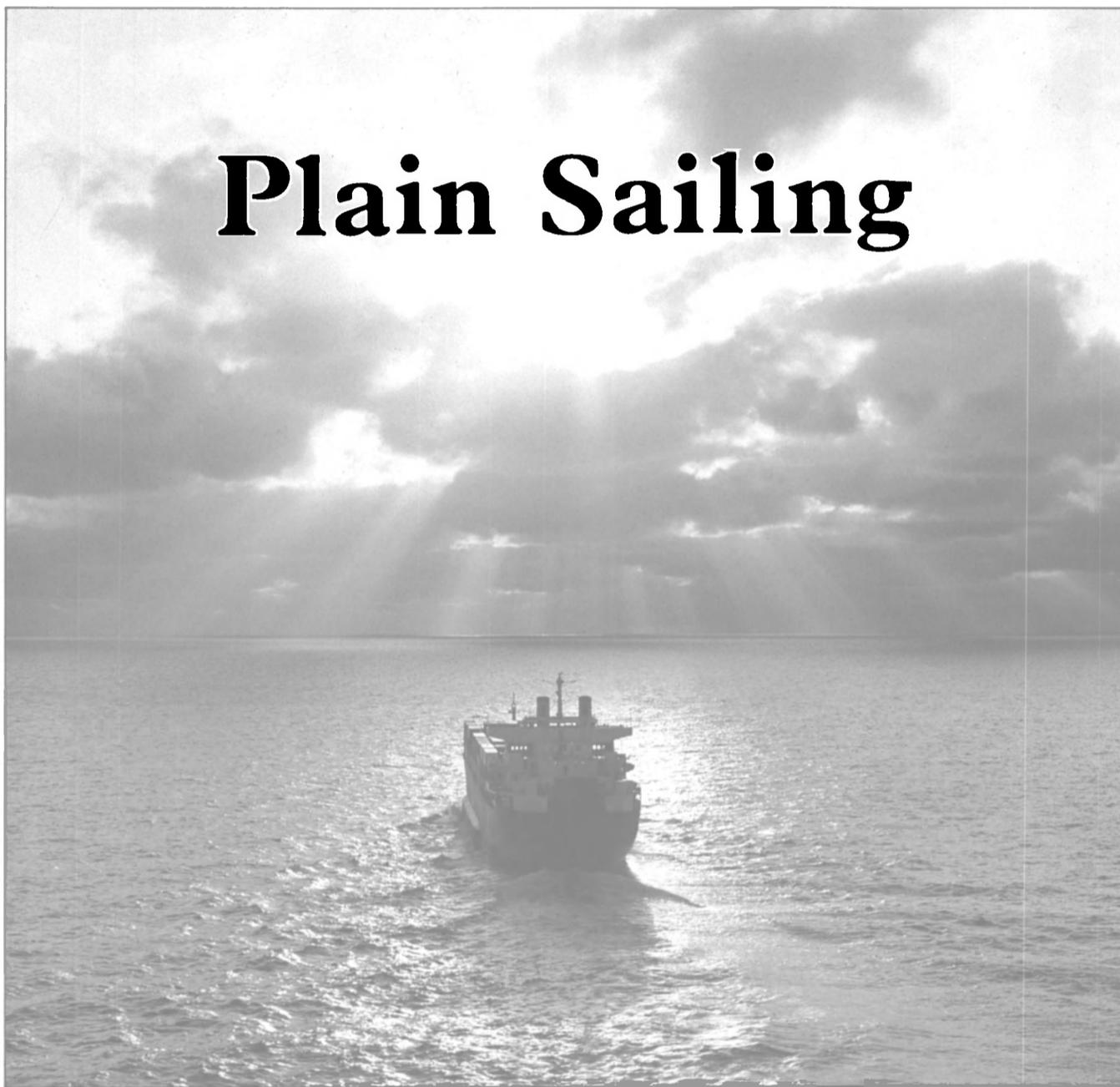
GPS is currently in its test and evaluation phase, with a total of 13 operational satellites in orbit out of a scheduled 24. Once the GPS satellite system is complete, the Transit system will be phased out. Current U.S. Government plans call for GPS to be fully deployed and operational in 1993; Transit will be kept on the air through the end of 1996.

Magnavox Advanced Products and Systems Company, located in Torrance, Calif., is a leading manufacturer of Transit and GPS satellite receivers, as well as other advanced electronics for military and commercial applications.

For free literature describing the MX 4102GPS,

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## FELS Gets \$81-Million Oil Rig Contract

It was recently announced that the Santa Fe International Corporation has placed an order worth about \$81,195,000 with Far East Levingston Shipbuilding Ltd. (FELS), Singapore, for the construction of a jack-up oil rig. Delivery is scheduled for early 1992.

This award is the fourth of its kind that FELS has in its order-book, and is the third they will be building for Santa Fe. **Choo Chiau Beng**, managing director, said that the order from Santa Fe "reflects the growing demand for a new generation of jackups as...a cost-effective alternative to semi-submersibles and platform rigs in harsh environment[s]."

Meanwhile, **Gordon M. Anderson**, the president of Santa Fe Drilling, said that the company expects to experience what he called "an escalating rig demand into the 90's." Mr. **Anderson** also said, "Santa Fe is committed to maintain a modern offshore drilling fleet."

For more information about facilities at Far East Levingston Shipbuilding,

Circle 123 on Reader Service Card

## Baker Marine Energy Receives \$100-Million Rig Order From China

The China National Offshore Oil Corporation recently placed an order for \$100 million with Baker Marine Energy for the construction of two production rigs to be used in China's offshore oil industry.

Included in the package are plans for project management, procurement, engineering design and the building of submerged pipelines. The rigs are to be installed in the South China Sea's Pearl River Basin. The Singapore-based rig builder has scheduled the project for delivery in 1992.

## Soundcoat Offers Adhesives To Complement Acoustical Materials

The Soundcoat Company, Deer Park, N.Y. has engineered a variety of adhesives, designed in combination with their acoustical materials, to serve a wide range of needs.

Soundcoat adhesives have undergone tests to determine their reliability under a variety of conditions including heat, humidity, chemicals, shocks, and vibrations. The result: Soundcoat acoustical materials come complete with a convenient and effective adhesive system, either pressure-sensitive, epoxy-based, or sprayable liquid, ready for use on the assembly line or for field retrofit at a cost-effective price.

Properties and specifications for all Soundcoat adhesives are described in detail in Bulletin #720. For a free copy,

Circle 16 on Reader Service Card

## Leevac Shipyards Awarded Supply Boat Contract

Leevac Shipyards, Inc., based in Jennings, La., was recently awarded a contract by a U.S. Gulf Coast firm to build a 200-foot offshore supply boat. This will be one of the first contracts for the construction of an offshore supply boat in the United States in about five years.

The vessel, with a 40-foot beam and a draft of 15 feet, will be powered by 12-645C EMD engines, providing approximately 3,000 hp, and a 600-hp bow thruster.

The vessel will have capacity of 1,600 barrels of liquid mud, 5,000 cubic feet of bulk mud, and about 50,000 gallons of fuel. The as-yet-unnamed ship is scheduled for delivery in December.

Located on the Mermentau River,

32 miles north of the Gulf Intracoastal Waterway, Leevac Shipyards, Inc. has been in the business of building, converting and repairing supply, geophysical, fishing and excursion vessels, as well as inland and offshore tank and cargo barges since 1913.

For more information about Leevac Shipyards' facilities,

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# 3. MAJ ALL YEAR ROUND

Circle 286 on Reader Service Card

# DIESEL POWER REVIEW

Selecting the appropriate propulsion or auxiliary power system for a vessel is one of the most difficult and important tasks facing the naval architect, marine engineer and vessel owner. With so many marine diesel engines on the market—low-speed, medium-speed and high-speed units; two-stroke and four-stroke cycle designs; cross-head- and trunk-piston types; loop-scavenged styles; and conventional and opposed-piston machines—the editors of *MARITIME REPORTER* asked the major makers of marine diesel engines to provide information on their latest developments and advancements in the propulsion and auxiliary power field.

Free product literature is available from the manufacturers included in this review. To obtain copies of brochures and technical literature from the companies, circle the appropriate Reader Service Number(s) on the postpaid card bound in the back of this issue.

## ALASKA DIESEL ELECTRIC

Circle 68 on Reader Service Card

Alaska Diesel Electric, Seattle, Wash., manufacturer of Lugger marine diesel and Northern Lights generators, will introduce several new propulsion diesels for the 1990 season.

The first will be a low profile version of its model L6140A. The 600 horsepower, 15-liter, turbocharged-aftercooled in-line six has been well received by owners of charter, work and fishing vessels. The new model is aimed at high performance vessels with smaller engine compartments.

The popular L6125A now has a new liquid-cooled, high efficiency turbocharger and other improvements which increased power output to 460 horsepower.

The new Lugger L6108A will be available in January 1991. This turbocharged-aftercooled, seven-liter diesel features four-cycle operation for smooth, quiet, fuel-efficient service. Power ratings for this new model have not been released but, according to Alaska Diesel Electric, it will compete in the 250 to 350 horsepower class.

Furthermore, Alaska Diesel Electric is developing a new 31-liter, V-12 marine diesel engine. With an expected output of 1,200 horsepower and a high power-to-weight ratio, the engine will target the high performance passenger vessel market. Alaska Diesel Electric also expects to market a heavy workboat version of the engine.

At present, Alaska Diesel Electric offers nine diesel models ranging from 61 to 600 hp. Extremely com-

pact, in-line Luggers are excellent choices for small engines. All are direct injected four cycles and can be customized with everything from front PTOs to flexible engine mounts.

## BERGEN DIESEL

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One of the latest designs from Bergen Diesel of Norway, the Type BR, is a four-stroke, turbocharged and intercooled engine with a bore of 320 mm and stroke of 360 mm. It is available in an in-line configuration with six, eight, or nine cylinders, with maximum continuous ratings of 425-500 bhp per cylinder at engine speeds of 720/750 rpm.

Type BRM for main propulsion has engine ratings of 3,000-4,500 bhp at 750 rpm. Ratings of the Type BRG for power generation range from 2,015 to 3,020 kw at 720 rpm/60 Hz, and 2,100-3,150 kw at 750 rpm/50 Hz. Backed by more than 20 years of experience with heavy fuel operation, Bergen's BR series is an engine design that aims at very high reliability and long intervals between overhauls, even when running on the poorest qualities of heavy fuel. Excellent access is provided for all maintenance work, and special tools such as hydraulic tightening jacks for the important bolt connections further ease and reduce maintenance time.

The cylinder block is a one-piece design with underslung crankshaft, a very rigid structure in nodular cast iron. Cylinder liners are centrifugally cast, with bore cooling only for the upper part where needed. The cylinder head is a bore-cooled design with thick bottom for good control of mechanical and thermal loads. The fully forged crankshaft with continuous grain flow has a large diameter journal and pin for low bearing loads.

Connecting rods are forged in alloy steel and machined all over. Bearings are steel-backed with lead/bronze bearing material and soft overlay. Pistons are of two-piece design, with three compression rings and one oil scraper ring, all chromium-plated to insure low wear rates. The fuel injection system of L'Orange make was developed for 1,400 bar injection pressure and has constant pressure unloading for cavitation-free operation at all loads/speeds.

## COLTEC

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Fairbanks Morse Engine, a divi-

sion of Coltec Industries, Inc., manufactures some of the largest engines in North America and has built a strong market by specializing in the production of engines for U.S. Navy ships and power generating utilities.

The parent company of Fairbanks Morse Engine recently changed its name from "Colt Industries" to "Coltec Industries," reflecting the withdrawal of the company from the firearms business. However, the name change has no effect on Fairbanks Morse Engine or the commitment of Coltec Industries to ensure that Fairbanks Morse Engine remains a world leader in diesel engine production.

Fairbanks Morse Engine has two basic product lines: Colt-Pielstick engines that generate between 4,400 and 29,000 horsepower and opposed-piston engines that range from 680 to 4,200 horsepower.

Colt-Pielstick engines propel the Navy's T-AO Class oilers, which transport fuel, cargo and personnel to ships at sea, and the LSD (dock landing ship) class of fast, modern assault vessels. They also generate power for electric utility companies. A dual-fuel version of the engine operates on a mixture of natural gas and diesel fuel.

The smaller opposed-piston engines generate power aboard ships and serve as backup propulsion power plants on nuclear submarines. A version fueled by natural gas pumps natural gas and oil in the petroleum industry.

Fairbanks Morse Engine products are being upgraded with higher horsepower and engine efficiency as the company's technology improves. Less expensive versions of the opposed-piston engines are being developed for niche markets, and new products are being built that produce lower emissions as air quality standards continue to toughen.

The six-liter TAMD61A remains unchanged at 306 hp at 2,800 rpm for light applications and 228 hp at 2,500 rpm for medium duty.

## CUMMINS

Circle 91 on Reader Service Card

One of the first vessels built in the Pacific Northwest with Cummins' new 6BTA5.9-M2 engines is the aluminum workboat Lucinda Rose.

Built in 18 days from start of construction to delivery by B&H Metal Products, Lewiston, Idaho, the bow-ramp, shallow-draft vessel was immediately hired by Exxon for the Exxon Valdez oil cleanup effort. Coast Guard certified to carry 49 passengers, the Lucinda Rose ferried beach cleanup crews until the

spill cleanup effort was discontinued last fall. The twin Cummins 6BTA5.9-M2 engines, coupled with Kodiak 303 waterjet propulsion units, are rated at 300 horsepower at 2,800 rpm. In a light-boat condition, the Lucinda Rose achieves a speed of 28 to 30 knots at a cruising rpm of 2400 to 2600.

In addition to excellent performance, fuel consumption on the initial trial amounted to only 7.3 to 7.8 gallons per engine at 2400 to 266 rpm. The vessel's fast, economical performance is attributed to the hull's flat-bottom design and the Cummins/Kodiak package.

The Lucinda Rose, designed for a variety of cargo transportation and fishing applications as well as carrying passengers, can haul six tons of cargo at 30 knots and carry up to 20 tons of payload off plane at 10 to 12 knots. The boat's bus-type seats are mounted on skids and can easily be removed so that the deck can be converted to carry commercial cargo, or fitted with a reel for gillnet salmon and herring fishing.

## DEUTZ MWM

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The cornerstone of the Deutz MWM line-up for the commercial marine market is the BVD 628 Series medium-speed diesel. Conceived and built in Germany to rigid specifications, and with some of the world's most resilient and durable components, the 628 has been logging some impressive statistics in engine longevity, performance, reliability, and fuel efficiency.

Deutz MWM first introduced their engines in the U.S. in 1863. From New England to the West Coast, and from the Gulf of Mexico to the Beaufort Sea, the 628 has found a strong niche among commercial fishermen, tugboat operators, and the general marine industry. Abroad, this engine, ranging from an inline six to a V-16 at 10,000 bhp, may be found in virtually all types of marine systems, including some of the world's most luxurious motor yachts.

There have been several published cases where after more than 20,000 hours between overhauls, certain 628 Series parts have been tested at new factory tolerances.

To answer the needs of the luxury, recreational, and high-speed naval and customs markets, Deutz MWM is offering two lightweight, high-speed models.

The 604B Series fits up to 2,600 hp at 1,800 rpm in its V-16. This engine is relatively small, very smooth operating, offers mechanical and technological advances un-

thinkable a decade ago, yet is amazingly simple in design. Its two outstanding features are access ports to the crankcase (for inspection of pistons, liners, and big end bearings); and a Hallo-swirl® design that virtually eliminates white smoke at low load and during acceleration. Except for information-feeding systems, electronic controls are kept to a minimum, thereby reducing potential problems that cannot be dealt with on board.

The "baby" of the water-cooled diesel family at Deutz MWM is the 234 Series. It carries the best of all the features that have made Deutz MWM one of the most respected names in the business. Neat, trim, and mean, the 234 is in great favor with sportfishermen and on yachts from 49 to 70 feet. It has an output of 1,100 hp at 2,300 rpm.

Best of all, though, is Deutz MWM's reputation for painstaking thoroughness and professionalism in all its installations. And its parts and service support are fast, efficient, and thorough.

### ELECTRO-MOTIVE

Circle 70 on Reader Service Card

In 1985, Electro-Motive Division of General Motors Corporation introduced the 710 G Series of medium-speed diesel engines. The larger displacement of the 710 engine as compared to the previous 645 model is a result of increasing the stroke by one inch.

This year, EMD introduced the first upgraded model of the new engine series. It has been designated the 710 GA. Whereas the 710 G provided as much as a 4 percent fuel economy advantage over the latest 645 model, the GA Series offers an additional 1.5 percent savings over the 710 G engine model.

The GA engine package includes new power assembly components, improved aftercoolers, and newly matched turbocharger and fuel injector components. The new components represent a further optimization of the air and fuel management resulting in increased combustion efficiency, and therefore improved fuel economy performance. The upgraded components are a result of state-of-the-art analytical and experimental methods used at EMD. Currently, performance improvements can be investigated through the use of computer simulations and qualified mechanically by other analytical means such as finite element analysis. Different designs can be evaluated before money is spent on expensive prototype hardware.

While performance improvement is the driving force behind engine design, changes are not acceptable if they compromise engine reliability. The present 710 engine averages a mean time between failures (MTBF) of approximately 400 days. The GA engine components have all been subjected to extensive experimental testing to guarantee the end product remains highly reliable. EMD calls the 710 engine the most efficient, most powerful, and most reliable diesel engine in its class.

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### GE ALCO POWER

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The ALCO 251 four-cycle diesel engine, which has proven its capabilities in the marine sector, as well as in power generation, locomotive and special-purpose applications around the world, is now part of General Electric's product offering. The ALCO 251 is a four-stroke

diesel engine, available in five sizes—six-cylinder in-line and eight-, 12-, 16-, and 18-cylinder V configurations. Maximum operating speed is 1,200 rpm for the six-, 12- and 16-cylinder models and 1,000 rpm for the eight- and 18-cylinder units. All of ALCO's 251 Series engines have the same bore (9 inches) and stroke (10.5 inches), and employ the same operating principles.

According to GE, several thousand ALCO 251 diesel engines are in operation throughout the world, with some delivering more than 25,000 hours of service between major overhauls. GE believes that the design simplicity of the 251 diesel is the key contributing factor in the engine's reliability, low-operating cost and ease of field maintenance.

(continued)

**MAN B&W**

**Two-Stroke Engines**

Model	Power Output (kW)
K90 MC/C	~45,000
K90 MC/MCE	~35,000
L90 MC/MCE	~30,000
S80 MC/MCE	~25,000
K80 MC/C	~20,000
L80 MC/MCE	~15,000
S70 MC/MCE	~12,000
L70 MC/MCE	~10,000
S60 MC/MCE	~8,000
L60 MC/MCE	~7,000
S50 MC/MCE	~6,000
L50 MC/MCE	~5,000
L42 MC/MCE	~4,000
L35 MC/MCE	~3,000
S26 MC	~2,000

**Four-Stroke Engines**

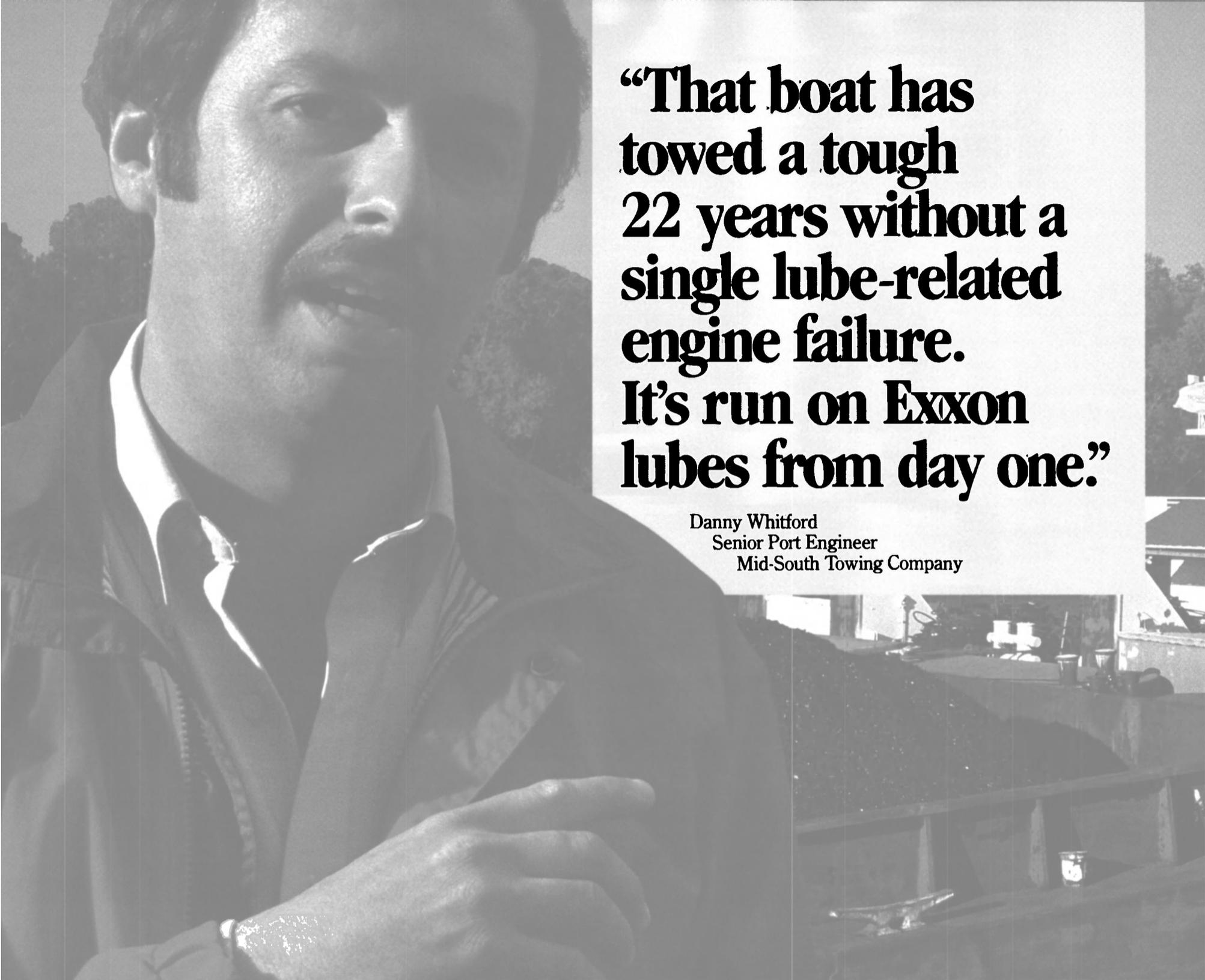
Model	Power Output (kW)
V52/55B	~15,000
L58/64	~12,000
V40/45	~10,000
L48/60	~8,000
V32/36	~6,000
L40/45	~5,000
L40/45	~4,000
V28/32A	~3,000
V25/30	~2,500
L32/36	~2,000
L28/32A	~1,500
L25/30	~1,200
V20/27	~1,000
L23/30	~800
L20/27	~600

Two-stroke engines with speeds ranging between 57 and 250 rpm develop between 1,200 kW and 49,300 kW supercharged output using our durable NA-series turbochargers.

Four-stroke engines with speeds ranging between 400 and 1,000 rpm develop between 500 kW and 14,000 kW supercharged output. NR and NA-series turbochargers for optimum utilization of fuel.

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**“That boat has  
towed a tough  
22 years without a  
single lube-related  
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It’s run on Exxon  
lubes from day one.”**

Danny Whitford  
Senior Port Engineer  
Mid-South Towing Company

He’s not talking pleasure cruises.

He’s talking 22 years of hard, honest work—often 24 hours a day, 7 days a week. He’s talking 165,000 hours per engine on the original crankshafts. He’s talking engine performance so outstanding on all 12 boats in the Mid-South fleet, Whitford calls it “abnormally good”!

And he’s crediting the Exxon difference—for helping Mid-South’s uncompromising maintenance program make its boats more productive from day one.

That difference is the Exxon Marine Lubrication Program—a unique collection of top-notch products and services for the shallow-draft marine industry. It helps Mid-South get maximum work from every boat, every day. It can do the same for your fleet.

Start with DE-MAR® 17 zinc-free heavy-duty engine oil. Its superior formulation provided such remarkable protection from engine liner and ring scuffing in Detroit Diesel’s

severe 6V92TA test, Detroit Diesel put the results in writing—saying DE-MAR 17 is “the first product of this type to pass.” The proof gets even sweeter. Because it’s also approved for all EMD engines. And recommended for the Caterpillar 3600 series.

Fact is, this Generation 5 API CD/CD-II quality oil is formulated for exceptional performance in *all* mains and auxiliaries. One oil, no matter what you’re running. And it’s supported by EXXGARD® Oil Analysis, featuring easy Quickdraw sampling. To help you catch problems before they catch you up a creek without an engine.

For more complex problem-solving, Exxon provides the computerized Equiptrak Reporting system. It summarizes long-term trend data on your equipment, your fleet *and* your industry. To help you manage with savvy. And our Marine Lubrication Chart gives you easy reference to the recommended lubes for every

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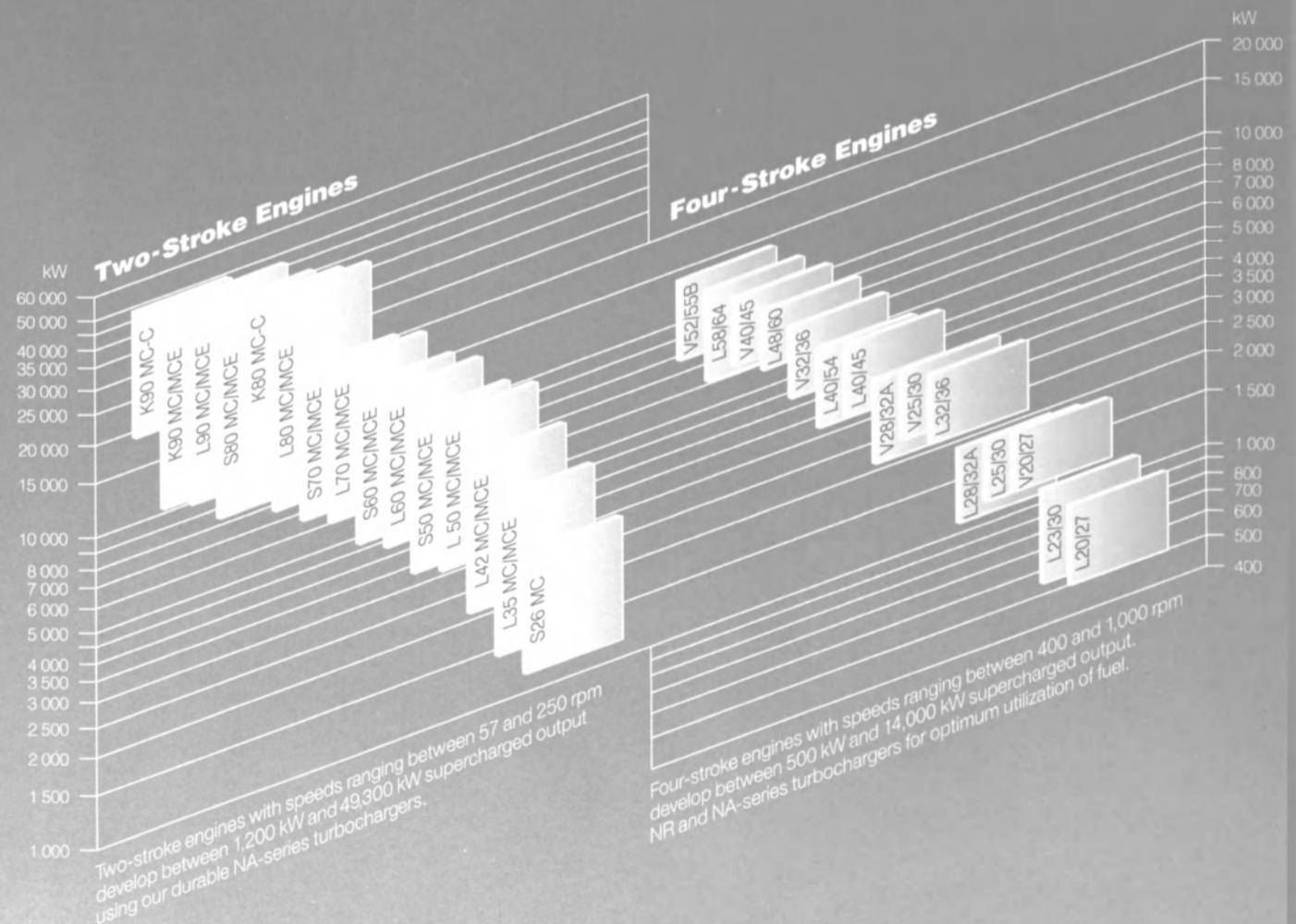
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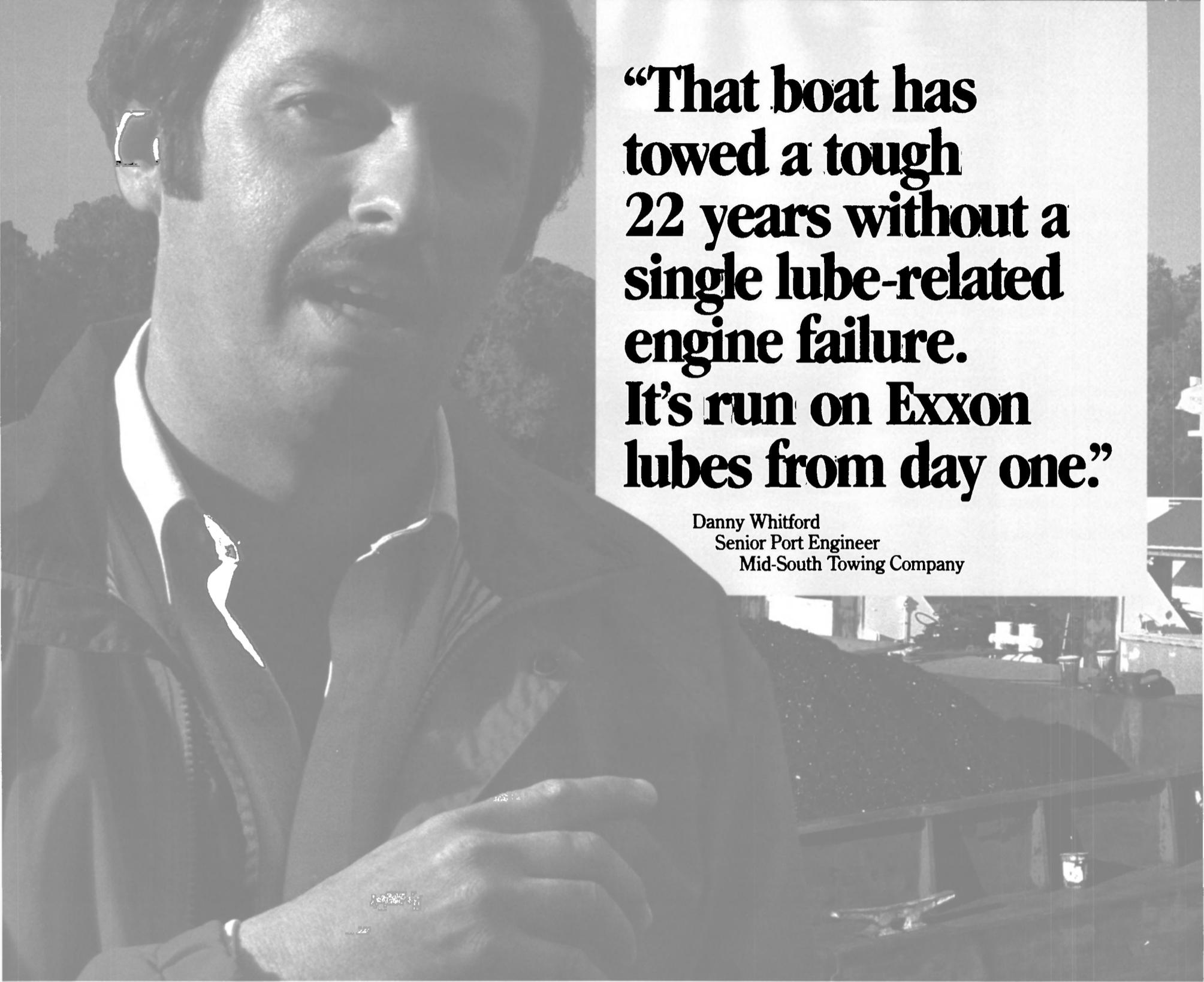
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To put the program to work, you get ongoing support from the Exxon marine team of dedicated industry specialists. As well as dependable local supply through the extensive Exxon dockside and midstreamer distribution network.

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## Diesel Power Review

(continued)

Also, a new redesigned cylinder head will shortly be available for the 251 series diesel. Preliminary indications from GE ALCO are that under testing these new heads (called 251 Plus) have outperformed the older design by a factor of two, and some aftermarket replacement heads by a factor of ten.

General Electric of Canada signed an asset purchase agreement in 1989 with Bombardier, Inc. to acquire its Rail and Diesel Product Division. ALCO was included in the acquisition. The company's manufacturing and international distribution is handled through Montreal, Canada, while its distribution in the U.S. is handled by a network of five distributors located throughout the country.

The ALCO business and GELC are part of GE Transportation Systems in Erie, Pa., which is also responsible for GE's locomotive, transit, off-highway truck systems and 7FDL diesel engine line.

## GMT

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Fincantieri's Diesel Engine Division, with the collaboration of specialized shipyards and technical experts, has designed and is ready to supply complete propulsion and power generation systems to meet the different requirements of various international navies, shipbuilders and ship designers.

The GMT (Grandi Motori Trieste) Model B/BL 230 diesel is the typical "naval" engine used in the Italian Navy. Its wide selection of models (six to 20 cylinders) and power ranges (1,000 to 5,600 kw) provides the possibility to use a standard cylinder for all types of vessels, ranging from minehunters, patrol craft and corvettes to frigates, destroyers and cruisers.

The engine is classified as a medium-speed unit, in accordance with the U.S. Navy specification MIL-E-23457. The main characteristics of the B/BL 230.8M (low magnetic signature and short stroke version) are: a piston bore of 230 mm, piston

stroke of 270 mm, and engine speed of 1,200 rpm in an eight-cylinder, turbocharged and intercooled model. The long-stroke version of this engine has a piston stroke of 310 mm and an engine speed of 1,050 rpm.

The use of low magnetic permeability materials in the occupied engine volume provides the optimal technical engine design, thus maintaining the same power level and TBO of the standard commercial engine, and at the same time, fulfilling the magnetic signature imposed by the Italian Navy.

In order to minimize the overall dimensions of the propulsion plant, the engine can be directly flanged to the reduction gear forming a rigid monoblock. The power transmission is connected via a flexible coupling and a friction clutch that can be located inside the engine—red gear connection housing. The whole propulsion set is designed to be installed on an anti-shock and anti-vibration elastic mounting system.

## HEDEMORA DIESEL

Circle 73 on Reader Service Card

During the 25 years since the completion of its first prototype submarine diesel engine, Hedemora Diesel AB of Sweden has made impressive progress not only in engine design, but also in the specialized field of exhaust turbocharging. The company's latest design is the twin-turbocharged VB 210 series 18-cylinder engine.

Their submarine background has given Hedemora engines an image of sturdy reliability. This image was successfully transferred to the general merchant marine and offshore market and the compact nature of the engines found favor in the oil drilling rigs which during a decade starting in 1974 provided the core of Hedemora's marine business.

For over two decades, the Hedemora VA 185 mm range of engines has provided the power for generator sets on Swedish coastal submarines. At present, 12-cylinder VA 185 engines are providing propulsion for the Swedish Navy's Vastergotland Class of submarines.

Hedemora first introduced the VA 185 Series of diesel engines in the early 1960s and since has added the VB 210 Series of diesel engines.

With the addition of the new 18-cylinder VB 210 Series, Hedemora diesels now have a power output range of 500 kw to 3,200 kw (670-4,291 hp).

There have been power improvements throughout the VA and VB ranges. One of the most notable recent developments is the availability of a new 2,100-kw (2,816-hp) model of the VB 210 12-cylinder engine.

Hedemora Diesel was selected to be the supplier of the main engines for the new Type 471 submarine for the Royal Australian Navy. The new submarines will each be equipped with three Hedemora VB 210 18-cylinder diesel generator sets with a combined output of more than 4 mw electrical power. Hedemora will supply a total of 19 engines under

the contract.

Type 471 submarines, which will replace the older Oberon Class, will be harder to detect, have greater range and speed and more endurance than their predecessors.

## ISOTTA FRASCHINI

Circle 74 on Reader Service Card

Fincantieri's Isotta Fraschini ID 36 diesel engines are designed to achieve maximum power-to-weight ratios, maintaining the original characteristics of reliability and long TBO.

The compactness of the engine permits its utilization in small engine rooms. The engine also exhibits very low noise emissions.

In fact, the propulsion or power generation sets driven by ID 36 engines can be easily contained in acoustic enclosures and fitted on a double system of elastic mountings.

The extremely compact engine architecture, along with its reliability, are the main reason for the ID 36's selection for propulsion aboard corvettes, fast patrol craft, harbor tugs, firefighting vessels, etc.

The engine is classed as a high-speed engine, in accordance with the U.S. Navy specification MIL-E-24455.

The main characteristics of the ID 36-AM (low magnetic signature model) are: a piston bore of 170 mm, stroke of 170 mm and engine speed of 1,200 rpm.

The original compact design of the engine and the selection of proper low magnetic permeability materials give the ID 36 engine low magnetic signature characteristics.

The modular design of the ID 36 engine series makes for simple installation as a propulsion or power generation unit.

Fincantieri's Diesel Engine Division produces low-magnetic signature engines covering a power range from 160 to 4,050 kw (215-5,431 hp), with a wide range of power selections combined with varying rpm.

Shock testing on ID36SS8V-AM diesels was recently successfully completed on behalf of the U.S. Navy. One propulsion and one generating set utilizing ID36SS8V-AM engines will be installed aboard the Navy's new minehunter ship USS Osprey.

## JOHN DEERE

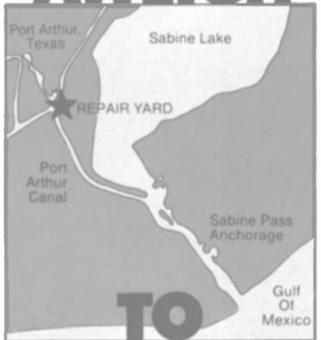
Circle 75 on Reader Service Card

Deere & Company's Engine Group will begin to market John Deere marine engines for commercial applications in 1991. The company announced its plans to enter the marine engine business last fall at Fish Expo in Seattle, where they unveiled two prototype engines.

According to Deere, two marine models, rated at 80 and 250 hp (propulsion), are slated for introduction in early 1991. Three more models will be available later in 1991, with the final engine coming about a year later. The engines will be used in propulsion, genset, and auxiliary power applications for fishing craft and workboats.



# ANCHORS AWEIGH



When your ship or drill rig needs maintenance or repair, there's one facility designed to meet all your needs—Sabine Yard in Port Arthur, Texas.

Conveniently located only eight miles upstream from the Sabine Pass Anchorage on the Gulf Coast, Sabine Yard has the unique capability to handle both large ships and mobile offshore drill rigs, and there is easy access as no bridges obstruct the channel.

- Ship docking area of 122' x 829'
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So when you need convenient and reliable service, contact Robert E. Lowrey, Bethlehem Steel

Corporation, Sabine Yard, P.O. Box 1448, Port Arthur, TX 77641; (409) 985-0571; FAX: 409-985-0555.

# Bethlehem



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application, on every boat in your fleet.

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More work.

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MREN

## Diesel Power Review

(continued)

Also, a new redesigned cylinder head will shortly be available for the 251 series diesel. Preliminary indications from GE ALCO are that under testing these new heads (called 251 Plus) have outperformed the older design by a factor of two, and some aftermarket replacement heads by a factor of ten.

General Electric of Canada signed an asset purchase agreement in 1989 with Bombardier, Inc. to acquire its Rail and Diesel Product Division. ALCO was included in the acquisition. The company's manufacturing and international distribution is handled through Montreal, Canada, while its distribution in the U.S. is handled by a network of five distributors located throughout the country.

The ALCO business and GELC are part of GE Transportation Systems in Erie, Pa., which is also responsible for GE's locomotive, transit, off-highway truck systems and 7FDL diesel engine line.

## GMT

Circle 72 on Reader Service Card

Fincantieri's Diesel Engine Division, with the collaboration of specialized shipyards and technical experts, has designed and is ready to supply complete propulsion and power generation systems to meet the different requirements of various international navies, shipbuilders and ship designers.

The GMT (Grandi Motori Trieste) Model B/BL 230 diesel is the typical "naval" engine used in the Italian Navy. Its wide selection of models (six to 20 cylinders) and power ranges (1,000 to 5,600 kw) provides the possibility to use a standard cylinder for all types of vessels, ranging from minehunters, patrol craft and corvettes to frigates, destroyers and cruisers.

The engine is classified as a medium-speed unit, in accordance with the U.S. Navy specification MIL-E-23457. The main characteristics of the B/BL 230.8M (low magnetic signature and short stroke version) are: a piston bore of 230 mm, piston

stroke of 270 mm, and engine speed of 1,200 rpm in an eight-cylinder, turbocharged and intercooled model. The long-stroke version of this engine has a piston stroke of 310 mm and an engine speed of 1,050 rpm.

The use of low magnetic permeability materials in the occupied engine volume provides the optimal technical engine design, thus maintaining the same power level and TBO of the standard commercial engine, and at the same time, fulfilling the magnetic signature imposed by the Italian Navy.

In order to minimize the overall dimensions of the propulsion plant, the engine can be directly flanged to the reduction gear forming a rigid monoblock. The power transmission is connected via a flexible coupling and a friction clutch that can be located inside the engine—red gear connection housing. The whole propulsion set is designed to be installed on an anti-shock and anti-vibration elastic mounting system.

## HEDEMORA DIESEL

Circle 73 on Reader Service Card

During the 25 years since the completion of its first prototype submarine diesel engine, Hedemora Diesel AB of Sweden has made impressive progress not only in engine design, but also in the specialized field of exhaust turbocharging. The company's latest design is the twin-turbocharged VB 210 series 18-cylinder engine.

Their submarine background has given Hedemora engines an image of sturdy reliability. This image was successfully transferred to the general merchant marine and offshore market and the compact nature of the engines found favor in the oil drilling rigs which during a decade starting in 1974 provided the core of Hedemora's marine business.

For over two decades, the Hedemora VA 185 mm range of engines has provided the power for generator sets on Swedish coastal submarines. At present, 12-cylinder VA 185 engines are providing propulsion for the Swedish Navy's Vastergotland Class of submarines.

Hedemora first introduced the VA 185 Series of diesel engines in the early 1960s and since has added the VB 210 Series of diesel engines.

With the addition of the new 18-cylinder VB 210 Series, Hedemora diesels now have a power output range of 500 kw to 3,200 kw (670-4,291 hp).

There have been power improvements throughout the VA and VB ranges. One of the most notable recent developments is the availability of a new 2,100-kw (2,816-hp) model of the VB 210 12-cylinder engine.

Hedemora Diesel was selected to be the supplier of the main engines for the new Type 471 submarine for the Royal Australian Navy. The new submarines will each be equipped with three Hedemora VB 210 18-cylinder diesel generator sets with a combined output of more than 4 mw electrical power. Hedemora will supply a total of 19 engines under

the contract.

Type 471 submarines, which will replace the older Oberon Class, will be harder to detect, have greater range and speed and more endurance than their predecessors.

## ISOTTA FRASCHINI

Circle 74 on Reader Service Card

Fincantieri's Isotta Fraschini ID 36 diesel engines are designed to achieve maximum power-to-weight ratios, maintaining the original characteristics of reliability and long TBO.

The compactness of the engine permits its utilization in small engine rooms. The engine also exhibits very low noise emissions.

In fact, the propulsion or power generation sets driven by ID 36 engines can be easily contained in acoustic enclosures and fitted on a double system of elastic mountings.

The extremely compact engine architecture, along with its reliability, are the main reason for the ID 36's selection for propulsion aboard corvettes, fast patrol craft, harbor tugs, firefighting vessels, etc.

The engine is classed as a high-speed engine, in accordance with the U.S. Navy specification MIL-E-24455.

The main characteristics of the ID 36-AM (low magnetic signature model) are: a piston bore of 170 mm, stroke of 170 mm and engine speed of 1,200 rpm.

The original compact design of the engine and the selection of proper low magnetic permeability materials give the ID 36 engine low magnetic signature characteristics.

The modular design of the ID 36 engine series makes for simple installation as a propulsion or power generation unit.

Fincantieri's Diesel Engine Division produces low-magnetic signature engines covering a power range from 160 to 4,050 kw (215-5,431 hp), with a wide range of power selections combined with varying rpm.

Shock testing on ID36SS8V-AM diesels was recently successfully completed on behalf of the U.S. Navy. One propulsion and one generating set utilizing ID36SS8V-AM engines will be installed aboard the Navy's new minehunter ship USS Osprey.

## JOHN DEERE

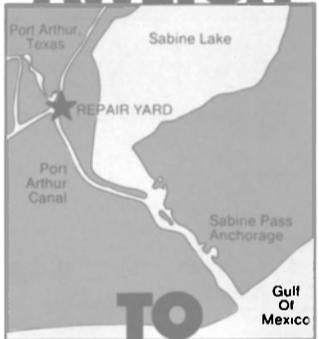
Circle 75 on Reader Service Card

Deere & Company's Engine Group will begin to market John Deere marine engines for commercial applications in 1991. The company announced its plans to enter the marine engine business last fall at Fish Expo in Seattle, where they unveiled two prototype engines.

According to Deere, two marine models, rated at 80 and 250 hp (propulsion), are slated for introduction in early 1991. Three more models will be available later in 1991, with the final engine coming about a year later. The engines will be used in propulsion, genset, and auxiliary power applications for fishing craft and workboats.



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**Bethlehem** 

Circle 202 on Reader Service Card

**Fred Thorne**, Deere's director of engine marketing, explained that the company's decision to enter this market is based on several factors including Deere's experience in designing and manufacturing reliable, durable, heavy-duty diesel engines.

"We plan to leverage our expertise and success in heavy-duty diesels to help address the types of problems and concerns voiced by marine engine users we've interviewed," said Mr. **Thorne**. He also cited a moderate rate of growth in the market and requests from Deere engine distributors as the reasons for the company's action.

Deere plans to begin testing its marine engines in fishing boats and a variety of workboats this fall. A network of marine servicing dealers is being established to support the engines. Mr. **Thorne** emphasized that these dealers will receive comprehensive training on Deere marine engines and will be served by the John Deere parts system—a computerized network of 11 regional depots supported by a central parts distribution center near Deere's corporate headquarters in Moline, Ill.

After showing the two prototype engines at various shows (a 240-hp, 7.6-liter, aftercooled, six-cylinder diesel with a Twin Disc marine gear and a 80-hp, 3.9-liter, four-cylinder diesel attached to a 20-kw Lima generator), designs have been revised to reflect customer suggestions.

"We want to ensure these engines address the specific needs of the commercial marine market. And the best way to accomplish that is to listen to those who will depend on these engines for their livelihoods," said Mr. **Thorne**. "Equally important is the feedback we receive from commercial boat manufacturers."

Although the company's announcement marks Deere's official entry into the marine business, John Deere engine distributors have been sending marinized engines to work on the water for several years. This means Deere will enter the marine market with several experienced marine distributors. Deere also brings 40 years of diesel design and manufacturing to the marine market.

## KRUPP MAK

Circle 65 on Reader Service Card

Krupp MaK diesel engines have been utilized in a wide range of propulsion and auxiliary power applications, from pushboats operating on the inland waterways to large luxurious oceangoing cruise ships.

When American Commercial Barge Lines (ACBL), one of the largest inland barge operators in the U.S., decided to refit new engines aboard its pushboat M/V Bill Elmer, three new Krupp MaK 6M 453 engines were selected. Since commissioning, the three diesels, each rated at 1,800 kw (2,414 hp) at 600 rpm, have run for 45,000 hours in heavy fixed-pitch propeller operation, with speed reduction and frequent load changes.

According to Krupp MaK, upon their latest overhaul, the condition of wear on the parts confirmed the excellent heavy oil capabilities of the model M 453 engines. The piston crowns were exchanged after 36,500 hours, although their replacement was not required. After 25,000 hours, the residual chromium layer still existed on the piston ring and the liners showed a wear rate of 0.01 mm per 1,000 hours of operation.

In a recently delivered 220-foot Canadian trawler, the Cape Adair, Krupp MaK supplied the entire propulsion and auxiliary power package. The economic and flexible propulsion and power package included a model 9M 453C, rated at 3,300 kw (4,425 hp) at 600 rpm, for main propulsion and a model 6M 332 diesel, rated at 1,280 kw at 900 rpm, for auxiliary power. The flexible system has three operating modes—(1) in sea operation, with-

out the refrigeration system, ship's power is supplied by the shaft-driven generator (PTO); (2) in sea and trawling operation, ship's power is supplied by the shaft driven generator (PTO) and power is supplied to the refrigeration system by the diesel auxiliary unit; and (3) emergency operation with diesel-electric propulsion, power is supplied for propulsion (and the refrigeration sys-

(continued)

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For more information, contact:  
GE Transportation Systems (USA)  
814/875-5757  
GE Locomotives Canada (Montreal, QC)  
514/253-7315



### Locomotive Power 251 Plus Diesel Engines Bore: 9.0 In. Stroke: 10.5 In.

Engine Speed (RPM)	Number of Cylinders				
	6	8	12	16	18
Engine Gross (GHP)	1500	1820	3000	4000	4500
Horsepower (CV)	1520	1845	3040	4055	4565

NOTE: 1. Engine gross output complies with AAR and UIC classifications.  
2. Other site conditions and ratings are available.

### Marine & Industrial Power 251 Diesel Engines Bore: 9.0 In. Stroke: 10.5 In.

			Engine Speed			
			900 RPM	1000 RPM	1100 RPM	1200 RPM
6 Cylinder Inline	Continuous BHP	1025	1215	1335	1400	
	Overload BHP	1125	1335	1470	1540	
8 Cylinder Vee	Continuous BHP	1455	1620	—	—	
	Overload BHP	1600	1780	—	—	
12 Cylinder Vee	Continuous BHP	2185	2430	2673	2800	
	Overload BHP	2405	2670	2940	3080	
16 Cylinder Vee	Continuous BHP	2915	3240	3560	3725*	
	Overload BHP	3205	3565	3920	4100*	
18 Cylinder Vee	Continuous BHP	3280	3645	4000	—	
	Overload BHP	3605	4010	4400	—	

NOTE: 1. Continuous BHP conforms with DEMA or DIN site. Other site conditions and ratings are available.  
2. Engine complies with major classification society requirements.  
\*3. Consult engineering for marine applications.

### Generator Power 251 Diesel Engines Bore: 9.0 In. Stroke: 10.5 In.

		Frequency/Speed		
		50 Hz/1000 RPM	60 Hz/900 RPM	60 Hz/1200 RPM
6 Cylinder Inline	Continuous KW	865	730	1000
	Standby KW	950	800	1100
8 Cylinder Vee	Continuous KW	1160	1040	—
	Standby KW	1270	1140	—
12 Cylinder Vee	Continuous KW	1730	1560	2000
	Standby KW	1900	1715	2200
16 Cylinder Vee	Continuous KW	2315	2075	2650
	Standby KW	2535	2280	2915
18 Cylinder Vee	Continuous KW	2780	2500	—
	Standby KW	3060	2750	—

NOTE: 1. KW output at generator terminals, and based on DEMA or DIN site. Other site conditions and ratings are available.  
2. Engine complies with major classification society requirements.  
3. Specifications subject to change without incurring any obligation for equipment previously or subsequently sold.

**GE Transportation Systems**  
ALCO Power

Circle 301 on Reader Service Card

## Diesel Power Review

(continued)

tem, if required) by the 1,280-kw diesel auxiliary unit. The shaft driven generator drives as a motor (PTI) the variable pitch propeller with nominal speed and reduced pitch. The ship's power supply is provided by a harbor diesel.

Two cruise ships being built at Rauma Shipyard for Discoverer Reederei GmbH of Bremen, West Germany, will each be fitted with two Krupp MaK model 8M 453C diesels and two 6M 332C engines. The two larger 8M 453Cs, rated at 2,940 kw (3,943 bhp) each at 600 rpm, will provide main propulsion, while the smaller 6M 332Cs, rated at 1,200 kw each (1,609 bhp) at 900 rpm, will provide auxiliary power.

Of particular note is that both the main and auxiliary engines operate on heavy oil IF 380. With these two vessels, now there are 30 "One Fuel Ships" with Krupp MaK engines.

In addition, the main and auxiliary engines are provided with resilient mountings to reduce the structure-borne noise as much as possible, a priority on board cruise ships.

### MAN B&W DIESEL

Circle 76 on Reader Service Card

More than 100 engines developing a total of 1 million horsepower have been sold in the newly-formed family of MAN B&W Diesel medium-speed, four-stroke diesel engines. This is convincing proof of the early success of the new family, which consists of the three in-line models L40/54, L48/60 and L58/64 in the power output range of 5,300-16,300 hp.

The design principle behind the engine family—a concept which represents a consistent response to the demands of the operators of freight and passenger vessels—has proved its soundness in more than 600,000 hours of operation. A number of original- and license-built plants have accumulated in excess of 30,000 operating hours.

The wear and lube oil consumption rates now available in a considerable body of figures confirm the soundness of MAN B&W's design considerations and expectations regarding the service lifetime of the key components.

Liner wear at top-dead-center position of the first ring is in the area of between 0.01-0.02 mm/1,000 hours. The wear of the first ring lies in the range of between 0.01-0.02 mm/1,000 hours.

Based on this, the lifetime of the liner can be calculated to be approximately 80,000 operating hours and for the first ring about 12,000 operating hours. In the case of the piston rings, it proved possible to even exceed these expectations in 58/64 engines in some cases.

The lube oil consumption rate showing consistently low values in the range of 0.7-1.0 g/kwh (0.5-0.7 g/hph) after more than 30,000 operating hours, also confirms the soundness of the design concept of MAN B&W's medium-speed engines.

The method of cylinder lubrication employed by MAN B&W has played a major role in achieving these favorable wear and lube oil consumption rates. This method of cylinder lubrication brings the correct volume of oil to where the oil is needed at the correct time. The result is cleanliness and perfect functioning of the ring package, even after lengthy operating periods.

Even at ignition pressures in the range of 160 to 180 bar in the L40/54 and L48/60 engines, a composite piston featuring a GGG piston skirt results in optimum piston running behavior and in a very low level of coke deposits at the fire lands.

Based on the experience to date with MAN B&W's state-of-the-art series of medium-speed four-stroke engines indicates that the service lifetimes of the key components first targeted have been achieved, and in some cases, surpassed. The picture emerging is that, with the MAN B&W design concept, it has been possible to achieve these values despite the firing pressure level. In fact, most of the service intervals lie within the range of time intervals between two dockings sought by operators.

With the exception of the piston rings and the injection nozzles, the lifetimes of all major components are in excess of 20,000 operating hours.

No doubt it is that these figures are dependent upon the variety of conditions the engine is operated in and whether or not it has been well maintained. All the claims made above assume that the requirements laid down by the manufacturer for service, maintenance, operating media, etc., have been adhered to rigidly.

In addition to long component life and long maintenance intervals, a simple, and, to the greatest possible extent, fault-excluding maintenance concept, possibly in connection with an effective diagnosis system, make a significant contribution to the overall economy of the engine plant.

Based on the accumulated data, the new MAN B&W Diesel engine family has established new standards of excellence.

### MTU

Circle 77 on Reader Service Card

In late 1989, MTU introduced its TE-designated split-circuit cooling system which now has been applied across the range of the company's popular Series 396 marine diesel engine program.

The most important feature of the TE designation is a controlled, internal charge-air cooling system (using engine coolant to cool the charge air), which adapts the temperature of the combustion air to match the various operating conditions. At idle and during low-load operation, the charge-air temperature is kept high, while in the medium- and full-load ranges, high engine power output with uniformly low thermal loading is ensured.

This coolant-temperature variation is achieved through the use of a thermostat which alters the amount

of coolant passing through the heat exchanger. At full power, the entire flow of charge-air coolant is directed through the heat exchanger—the temperature drops from approximately 85 degrees C to 50 degrees C (185 degrees F to 122 degrees F). At idle speed, the coolant bypasses the heat exchanger and remains at the engine outlet temperature of approximately 75 degrees C to 85 degrees C (167 degrees F to 185 degrees F).

As already employed in MTU's Series 183 engines, Series 396 TE engines use plate-core heat exchangers rather than traditional tube-type units. As the plates are constructed of titanium, they are both light and corrosion-resistant. And, since raw (sea) water no longer passes through the intercooler, corrosion and resulting leaks are eliminated. Additional advantages include improved heat-exchanging characteristics and ease of maintenance, as the plates are easily accessible for disassembly and cleaning.

Additional improvements to the TE engines are provided by MTU's R 082 electronic governor, a torsionally resilient steel-spring coupling (Geislinger system) and MTU's sequential turbocharging, which adds or deletes turbochargers depending on the amount of power required. The oil system, exhaust system and crankshaft bearings also have been subjected to further design developments.

MTU Series 396 TE engines are rated from 680 kw (925 hp), the model 8V396TE64 engine, to 2,240 kw (3,050 hp), the 16V396TE94 unit. Of special note for applications with higher horsepower requirements, MTU will continue to produce the 12V396TB94 (1,920 kw/2,610 hp), the 16V396TB84 (2,240 kw/3,050 hp) and the 16V396TB94 (2,560kw/3,480 hp). A complete listing of MTU marine diesel engines from 52 kw/71 hp to 7,400 kw/10,060 hp is available from MTU North America.

### PAXMAN DIESELS

Circle 78 on Reader Service Card

Paxman Diesels Ltd., one of the United Kingdom's principal manufacturers of high-power, high-performance diesel engines, has been a major supplier to the British Royal Navy for well over a half century.

Paxman has supplied low magnetic signature marine diesel engines for the Sandown Class single-role minehunters, developed and built for the Royal Navy by the U.K.'s Vosper Thornycroft. These GRP-hulled vessels are each powered by two Paxman Valenta 6RP200E propulsion engines. These Valenta six-cylinder engines, which were chosen for their overall reliability, economy of operation and high-shock resistance, have a continuous rating of 500 kwb (670 bhp) at 1,200 rpm. When installed in minesweepers, the power rating of these engines is raised to 755 kwb (1,012 bhp) at 1,460 rpm.

The advance of magnetic signature ranging techniques has allowed the basic Paxman Valenta engine to be developed for MCM applications. Significant advantages are

gained in using Valenta RP200E engines for MCMs, according to Paxman, including: extended periods between overhauls, increased reliability and ease of maintenance. These are all major factors when considering propulsion machinery for MCM vessels.

The RP200E is available in six in-line and 8- and 12-cylinder V configurations, with continuous ratings from 560 kwb (750 bhp) at 1,000 rpm up to 1,510 kwb (2,024 bhp) at 1,460 rpm.

In other work for the British Royal Navy, Paxman has provided diesel power modules for the combined diesel and gas turbine (CODLAG) propulsion system in the new Type 23 Antisubmarine Warfare frigates. Twelve of these ships are now under construction or on order. The first of the class, the HMS Norfolk, is due to be commissioned shortly.

Four Paxman Valenta 12RP200CZ power modules each having a continuous power output of 1.3 mw 440/600 v at 1,200 rpm, provide the power for the propulsion system and ship's electrical supplies aboard each frigate.

Besides its work on Royal Navy MCMs and frigates, Paxman has supplied diesel engines to more than 50 navies from around the world.

### STEWART & STEVENSON

Circle 129 on Reader Service Card

Stewart & Stevenson Services, Inc., with branches in Harvey, La., and Houston, Texas, is one of the world's largest distributors of Detroit Diesel and General Motors-EMD engines from 50 to 4,300 hp.

With a normal inventory of hundreds of diesel engines and generators, a staff of experienced mechanical, electrical, and marine engineers, along with 24-hour worldwide parts and service, Stewart & Stevenson offers an excellent support network to its customers.

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Stewart & Stevenson can provide custom-engineered power systems for all marine applications.

### SULZER DIESEL

Circle 66 on Reader Service Card

Sulzer Diesel Ltd. is the new name for the diesel engine company of Sulzer Brothers Ltd. The decision to change from MBS Diesel Engines Ltd. arose early this year when the West German Government vetoed the proposed takeover of the company's diesel engine activities.

Sulzer Brothers Ltd. will adhere to its strategic intention of seeking a partner to participate in its diesel engine subsidiary. Sulzer Diesel Ltd. is continuing diesel activities as before and maintaining the same high level of research and development.

Sulzer Diesel recently introduced a new low-speed engine type, the RTA84C, tailored for large contain-

erships. The first engine was demonstrated at the Aioi engine works of Diesel United in Japan. Already there are orders for 14 of the model RTA84C engines with six, eight, nine and 10 cylinders and a total power output of 615,000 bhp.

The RTA84C provides up to 3,820 kw per cylinder (5,200 bhp per cycle) at 100 rpm. Thus, with up to 12 cylinders, the RTA84C can supply a maximum continuous output of 45,840 kw (62,400 bhp). It responds to the trend towards larger, faster containerhips that require much more propulsion power.

The first RTA84C will be installed on a 3,600-TEU container-ship under construction at the Kure shipyard of Ishikawajima-Harima Heavy Industries Co. Ltd of Japan. The unit will be a nine-cylinder model of 33,100 kw (45,000 bhp) at 100 rpm.

Sulzer RTA Series engines have been very successful in the propulsion of large containerhips, particularly with the 840-mm bore RTA84 and RTA84M models. Of the 117 engines of these models ordered so far, 55 have been for containerhips. However, in discussions for new-building projects in the past two to three years, there have been increasing indications towards the need for higher shaft speeds and higher power outputs.

### VOLVO PENTA

Circle 79 on Reader Service Card

Volvo Penta of America recently announced that it has increased horsepower ratings for most of its marine diesel models.

Leading the way is the 16-liter TAMD162B, producing 612 hp at 2,100 rpm, for pleasure or light-duty application. The 162B is turbocharged and aftercooled and features four valves per cylinder all contributing to highly efficient combustion and low emission levels. The TAMD162 is also available in a medium-duty rating of 490 hp at 1,900 rpm and a heavy duty version rated at 470 hp at 1,800 rpm.

Volvo Penta's popular 12-liter TAMD122 is now available in a higher output, lower profile "D" model with 480 hp at 2,050 rpm. Other versions of this engine include the light or medium-duty TAMD122A, developing 450 hp at 2,000 rpm and 400 hp at 1,900 rpm, respectively. The continuous (heavy) duty 122A produces 380 hp at 1,800 rpm.

Suited for smaller vessels are the 10-liter model TMD102A and the 12-liter TMD122A. Available in continuous ratings of 238 hp at 1,800 rpm (102A) and 300 hp at 1,800 rpm (122A). These turbocharged (non-aftercooled) diesels provide reliable, economical propulsion or auxiliary power in all types of installations.

The turbocharged, aftercooled TAMD71 and TAMD61 represent the very latest development in marine diesel technology. The seven-liter model TAMD71B is an in-line six-cylinder power plant that produces 380 hp at 2,600 rpm and is suited for high performance fishing and pleasure boats. Its counterpart, the TAMD71A is available in light,

medium and heavy duty versions. Horsepower ratings are 350 hp at 2,500 rpm, 286 hp at 2,500 rpm and 218 hp at 2,000 rpm.

The six-liter TAMD61A remains unchanged at 306 hp at 2,800 rpm for light applications and 228 hp at 2,500 rpm for medium duty.

### WARTSILA DIESEL

Circle 67 on Reader Service Card

Wartsila Diesel Inc., the U.S. subsidiary of Wartsila Diesel, has acquired the Power Systems division of the Morrison-Knudsen Corporation, Rocky Mount, N.C. The company will be renamed MKW Power Systems Inc. Both Wartsila Diesel Inc. and MKW Power Systems supply diesel engine packages to the power plant and marine propulsion systems in North American market. Operations include service and spare parts sales.

The acquisition will expand the U.S. market for Wartsila Diesel heavy oil and gas engines. MKW Power System Inc. will also use

Wartsila Diesel engines in its power system packaging.

According to **Clas-Eirik Strand**, president of Wartsila Diesel Inc., the company acquired is one of the leading diesel engine system packagers in the U.S.

"The company also designs and manufactures first-class control systems," said Mr. Strand. "Thanks to the acquisition, we will be able to offer our customers more competitive products with an extremely short turnaround time."

**Pentti-Juhani Hintikka**, president of the Wartsila Diesel Group, explained that in the future, the company will concentrate more on comprehensive packaging for modular and standard power plant types and on ready solutions in general. "We will be investing more and more in ecofriendly gas and multi-fuel engines," said Mr. Hintikka.

Wartsila Diesel is one of the world's leading manufacturers of diesel engines, with production plants located around the world.

The company recently acquired a 60 percent share in Dutch Stork-

Werkspoor Diesel, now Stork-Wartsila Diesel. The engine manufacturer now offers one of the most complete medium-speed engine lines on the market. Both the wide product range and the combined market positions of the two companies enhance the competitiveness of the new venture.

Wartsila Diesel's product range includes the well-known Vasa 22, 32 and 46 engine series. The Vasa 22 and the Vasa 32 are widely used in the marine market as main and auxiliary engines in a variety of vessel types.

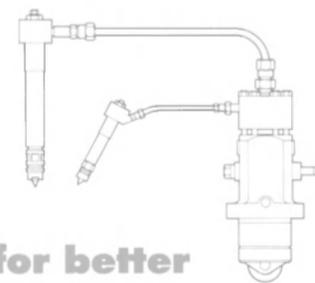
The Stork-Wartsila Diesel engine line reinforces Wartsila Diesel's product range for both marine and land-based installations. The SW 280 complements the Vasa main engine range, and is suitable for various small and medium-sized vessel applications such as tugs and dredgers. The TM 410 and 620 engines have excellent operational records in a wide scope of marine propulsion applications. Both engine types are suitable for diesel power plants, a growth sector for Wartsila Diesel. ■

## L'Orange injection: the heart of the driving force



Since the invention of the diesel engine, the course of its development has been shaped by L'Orange injection systems. The diesel's present significance as a highly loaded engine is still tightly connected with the name L'Orange. Major engine manufacturers have placed their trust in L'Orange injection technology as the key to the design and operation of very economical large diesels. In close co-operation with the international diesel-engine industry, L'Orange is active in the development of new injection systems and the improvement of those already in operation. The aim is further optimization of the diesel engine - optimization defined as increased performance, reduced fuel consumption and longer service life. This is a development which is assured by the engineering excellence of L'Orange in the field of injection technology.

## L'Orange Injection Systems



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diesels

L'Orange GmbH



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Circle 217 on Reader Service Card

# MARINE LUBRICANTS

The trend toward upgrading output and efficiency of marine diesel engines, as well as improving their ability to burn heavy residual fuels with high sulfur content, has placed increasing demands on the petroleum industry to improve their products. The oil producers have responded by offering new and reformulated marine lubricants, including highly alkaline cylinder oils to protect against the acidity resulting from the burning of residual fuels, and improved system oils to meet the severe-service demands of the latest engines.

The following review is based on data supplied by the major producers of marine lubricants. Free brochures and data sheets giving full details on the formulations and capabilities of these oils are available from all of the producers included in this review. To obtain copies, just circle the appropriate Reader Service Number(s) on the postage-paid card in the back of this issue.

## CASTROL MARINE OILS

Circle 82 on Reader Service Card

The cylinder lubrication of slow-speed crosshead engines has always been considered an extremely critical area in the field of marine lubrication. This area has become even more critical with modern engines generating very high pressures and temperatures compounded by the widespread use of poor quality fuels.

Almost 20 years ago, engineers realized that uprated crosshead engines would require higher quality cylinder lubricants than those that were available. Because uprated crosshead engines burn more fuel per cylinder unit volume and have a higher tendency to convert the fuel's sulfur into its acid component, engineers addressed the alkalinity of the cylinder oil as measured by Total Base Number (TBN). Over the intervening years, all of the major oil companies conducted extensive R&D programs which showed that indeed alkalinity was the major influence on wear performance. Sporadic use of high TBN products confirmed this fact, yet no oil company took the step of formally launching a higher than 70 TBN oil, largely because such a product could not be made commercially attractive.

The Castrol Company was a major groundbreaker in this field. Early in 1989, the company launched its unique Castrol Marine Cyltech 80. This highly successful crosshead engine cylinder oil has a TBN of 80 and contains a unique antiwear additive combination, which offers the shipowner the best of both worlds.

The owner can either use Cyltech 80 at the same feed rate as a conventional product and achieve savings through greatly reduced wear of components or he can reduce the feed rate of Cyltech 80 by at least 15 percent and achieve direct cost savings on his cylinder oil bill while still maintaining or improving the wear profile of cylinder liners and pistons.

According to Castrol, Cyltech 80 has been in use for over 12 months and consistently exceeded the company's performance predictions. Castrol reports that cylinder liner wear can be reduced by up to 60 percent and piston ring wear by almost 50 percent.

In an effort to maintain a leading position in the marine lubrication technology field, Castrol has extended its R&D program to investigate the effects on lubrication of high surface temperatures on cylinder liners and piston rings.

## CHEVRON

Circle 87 on Reader Service Card

Chevron has introduced Chevron DELO Marine Oil 477 for the inland marine trade class. It is marketed as Chevron DELO 6170 Oil for customers on the western and eastern seaboard.

Chevron's DELO Marine Oil 477 (DELO 6170 Oil) is test proven, demonstrating superior results in the field for today's new generation high-performance diesel engines. This product is designed especially for use in engines for towboat service where some current lubricants may have limited performance and is compounded to a high alkalinity level, measuring 17 TBN (Total Base Number) by ASTM Method D-2896.

New engine designs require improved oxidation and viscosity control for operating demands of fuel efficient engines with higher combustion pressures and temperatures. Increased alkalinity reserve is required for corrosive wear protection and especially for operations requiring extended drain intervals.

DELO Marine Oil 477 (DELO 6170 Oil) was field tested in marine and locomotive service in GE and EMD engines with full approval from these engine manufacturers. Field testing demonstrated increased oxidation and viscosity control compared to typical Generation 4 lubricants. This increased oil control can allow increased drain intervals for GE engines and due to increased drain intervals, the added alkalinity reserve also provides the ability to extend drain intervals. This superior oxidation stability and viscosity control was also demonstrated in EMD engines

modified to run at higher operating temperatures to increase efficiency.

Chevron DELO Marine Oil 477 (DELO 6170 Oil) provides an optimized engine oil formulation for today's service requirements for industrial engine design in marine towboat and ferry service.

## EXXON

Circle 83 on Reader Service Card

De-Mar<sup>®</sup>, formulated by Exxon Company, USA, is reportedly the first zinc-free, high-TBN marine lubricant to pass Detroit Diesel's severe 6V92TA engine dynamometer test. As a result, Detroit Diesel has approved De-Mar 17 for use in main propulsion and auxiliary diesel engines. The approval is based upon the evaluation of wear protection performance and valve guttering protection of the lubricant in Detroit Diesel's two-cycle engines.

According to Detroit Diesel, the acceptable results obtained from its severe 100-hour 6V92TA engine test demonstrated the wear protection capability of De-Mar 17. In addition, the inspection data of towboats operating DDC 8V71N auxiliary engines indicated that De-Mar 17 did not cause valve distress in those engines at the 11,000-hour inspection.

Exxon backs its products with the De-Mar 17 marine engine oil limited warranty. This is said to be the industry's first written warranty providing engine repairs if damage is directly caused by the recommended Exxon lube.

As part of a comprehensive inland marine program, Exxon also provides several lubrication services. The Exxgard<sup>®</sup> oil analysis program with Exxon's unique "Quickdraw" sampling method helps detect engine problems before they cause failures. Clean, hassle-free sampling makes the Exxgard program convenient to use. Proper sampling ensures consistent, meaningful analyses.

Equiptrak Reporting comprises another Exxon lubrication service. The program tracks unapparent long-term operating trends by engine and fleet to promote smarter fleet management. It also flags problem trends so that preventive maintenance programs can be designed. In addition, Equiptrak is cross-referenced to help guide management decisions from personnel to purchasing.

Exxon also provides a marine lubrication chart that recommends appropriate lubes for every need to prevent misapplication. The chart helps to narrow the number of products needed, resulting in inventory cost savings. With the marine lubrication chart, Exxon can design cus-

tomers lube programs quickly and efficiently.

Exxon offers a comprehensive line of heavy-duty marine lubricants backed by an experienced technical support and marine sales team dedicated to the workboat industry. In addition, Exxon's large distributor base provides convenient access to the marine lubrication program elements.

## MOBIL OIL

Circle 84 on Reader Service Card

Mobil Oil Corporation's newest lubricants for marine engines include:

*Mobilgard 570 SAE 50*, a superior quality marine diesel engine cylinder oil, is formulated to provide excellent performance in high output crosshead engines with brake mean effective pressures (BMEP) of 16-18 bar and peak pressures of about 160 bar. These highly loaded crosshead diesel engines are operated on heavy fuel oil with high sulfur content in order to reduce operating costs. Concurrently, advances in engine thermodynamics have permitted decreases in specific fuel consumption from 155 to 115 g/hp/hr.

Mobilgard 570 was developed to provide high load carrying characteristics, improved spreadability, tenacious film retention, and to minimize port and piston deposits. Because of its high alkalinity (70 Total Base Number), it provides better protection against corrosive wear by neutralizing large amounts of strong acids. This oil is compatible with oils normally used in the crankcases of crosshead engines.

*Mobilmar 300 Series* marine diesel engine lubricants are high-ash, zinc-containing oils formulated specifically to withstand the unusually heavy stresses found in high-temperature, low-oil consumption, four-cycle, highly turbocharged engines. Mobilmar 300 Series oils optimize engine life by assuring outstanding control of varnish, ring carbon, and piston undercrown deposits. These lubricants provide very good water separation and offer a high TBN level (14.7) with excellent alkalinity retention. Their sustained alkalinity provides excellent protection against corrosion when using fuels containing up to 1.54 percent sulfur.

Mobilmar 300 Series engine oils are available in two SAE grades: 30 and 40.

Mobilmar 300 Series engine oils are specifically recommended for the Caterpillar 3600 and 3500 Model diesel engines.

*Mobilmar 100 Series* diesel engine oils are low-ash, zinc-containing (continued)



**At this point  
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you money**

**At this point we can show you how . . . .**

Castrol Marine Cyltech 80 is a new generation cylinder oil for crosshead engines which gives the first breakthrough in over 20 years in the battle against corrosive and abrasive wear. Developed after years of intensive research and testing, Cyltech 80 has been designed to satisfy the demands of the latest high powered super-long-stroke crosshead engines. Incorporated in its formulation is a new family of highly efficient acid neutralizing agents plus a special anti-wear additive combination\* making Cyltech 80 eminently

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el. ....	

suitable for the cylinder lubrication of all crosshead engines.  
\* patent applied for



Castrol Marine Cyltech 80 can give reductions in liner and ring wear rates of at least 30% and overhaul intervals extended by 30-50%. It can reduce down time and provide an added safety factor against excessive wear. All of these benefits – not the least being an overall improvement in engine efficiency – lead to cost savings and even greater savings can be achieved in many cases through reduced cylinder oil feed rates when using Cyltech 80.

**Castrol Incorporated Marine Department**, Raritan Plaza II, Raritan Center, Edison, N.J. 088 37. Telephone: (201) 225 6390. Fax: (201) 225 1069.

## Marine Lubricants

(continued)

ing lubricants which provide protection against ash deposits and valve guttering. The lubricants offer high-temperature detergency and provide a unique degree of high dispersancy during intermittent, cyclic, and high-idling service, thereby

controlling soot and minimizing sludge formation. As a result, their protection of slipper bushings and piston liners against wear is excellent. They also provide excellent valve train wear protection.

Mobilmar 100 Series oils are available in three SAE grades: 30, 40, and 50 to optimize film thickness. These oils meet the low-ash requirements of heavy-duty, two-

cycle diesel engines.

*Mobilgard 450 SAE 40* engine oil is formulated with high quality base stocks which provide low consumption characteristics, high temperature oxidation resistance and thermal stability. These base stocks are combined with specially selected stable additives resulting in an engine oil with well-balanced properties.

Its detergent/dispersant qualities

result in increased filter life and engine cleanliness levels.

Mobilgard 450 engine oil has proven its superior heavy duty service with fuel oil up to two percent sulfur. Mobilgard 450 has proven its performance in extensive service in engines manufactured by Electro-Motive Division of GM, General Electric, ALCO, Fairbanks Morse, Detroit Diesel, Caterpillar and Cummins.

## SHELL OIL

Circle 85 on Reader Service Card

With the introduction of Caprinus® UE Multigrade, 17 Total Base Number (TBN) and Caprinus U Multigrade (13 TBN), Shell Oil now offers two new products for tugs, workboats, coastal tankers, auxiliary power generators and other medium-speed diesel applications.

The 17 TBN Caprinus UE 20W-40 is formulated for extended oil life in newer, low-oil-consumption engines such as GE's in severe service. Caprinus U has its widest application in EMD diesels and GE engines in less severe service.

According to Shell, compared to the single grade oil now used, Caprinus multigrade oils can cut oil and fuel consumption. This was proven during an 18-month field testing using 16-cylinder EMD diesels. Oil consumption reportedly dropped over 20 percent. In load-box and dynamometer tests conducted on two- and four-stroke cycle engines, Shell reports a fuel savings of 1 percent.

Shell reports that less wear, better cold starts and extended drain intervals should also accompany installation of Caprinus multigrade oils. When Caprinus multigrade oil is pitted against an SAE 40 grade, Shell claims bearing weight loss is cut almost in half.

Almost all operators want to extend drain intervals between scheduled shutdowns for maintenance. An oil's ability to do its job over the extended interval is usually limited by one of two things—the loss of grade due to viscosity increase or by exhaustion of capacity to absorb acid by-products of combustion, as measured by TBN. Regarding the viscosity increase, Shell's Shellvis viscosity index improver does an excellent job of grade retention. And the high alkalinity of Caprinus UE (TBN 17), which results from Shell's proprietary detergent technology, should furnish all the acid-absorbing capacity needed for longer drain periods.

Operations with EMD diesels, where long-term TBN management is not as pivotal an issue, will also benefit. Thanks to Shell's detergent technology, Caprinus U Multigrade with a 13 TBN offers a TBN retention comparable to many competitive 17 TBN products.

## TEXACO

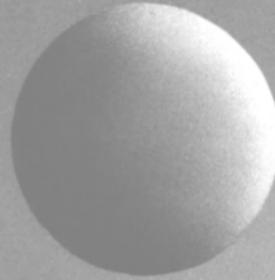
Circle 110 on Reader Service Card

Texaco offers a complete line of quality marine lubricants which are available worldwide to meet the

(continued on page 51)

← Circle 233 on Reader Service Card

# Asea Brown Boveri service has the speed and skill to keep the ball in the air.



The great majority of diesel engines over 500 kW have BBC turbochargers, so an extraordinarily wide-spread, fast and efficient service organization to spare you nasty surprises will come as no surprise.

From the first (which we were) our aim has been to lead (which we do) in achieving the highest benefits at the lowest costs. And we do it most effectively. It's been proved by experience.

Every year we train over a hundred technicians in providing fast, flawless service at minimum cost. They are based at service centers strategically located all over the world. And backed by a central register containing instant, precise details about your turbocharger. Their job is to keep things running. To keep the ball in the air.

Authorized BBC Turbocharger Service Centers in the USA.

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Fax 201-932-6378

Golten Service Co. Inc.  
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Karl Senner, Inc.  
New Orleans, LA 504-469-4000

Ciserv—San Francisco  
San Francisco, CA 415-655-7377

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ENGINEERING NEWS

**JULY 1990**

# EMD

## A Name The World Has Grown To

# *Trust*

60,000 engines!  
No other manufacturer of  
medium speed Diesel engines  
has produced as many.

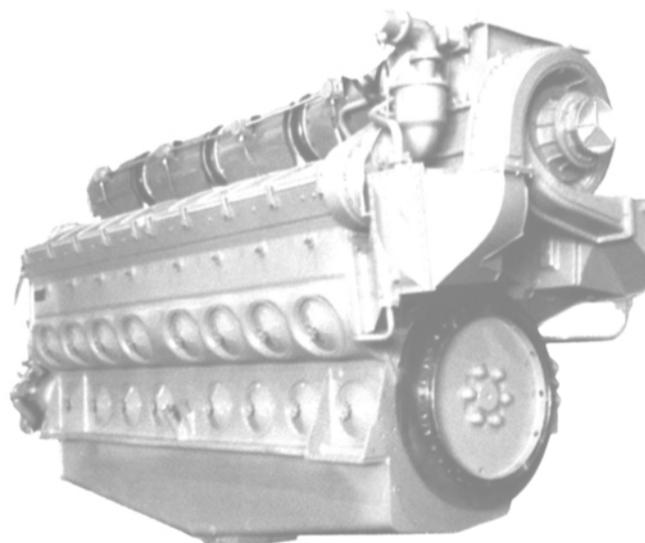
General Motor's Electro-Motive Division is the leading manufacturer of medium speed Diesel engines, building more engines than any other manufacturer in its class.

EMD employs advanced engineering technologies and proven manufacturing processes to produce Diesel engines that are reliable, economical and easy to maintain. Our commitment to quality is built into every engine.

At EMD, this commitment has provided world-class products for the past fifty years. That tradition continues today.



**A Proud  
Tradition  
Continues**



## COAST GUARD



### U.S. Coast Guard Celebrates 200 Years Of Service

Although formed under the Treasury Department from the Lifesaving Service and Revenue Cutter Service in 1915, the roots of the U.S. Coast Guard can be traced to August 4, 1790. It all began with a request by the Secretary of the Treasury, Alexander Hamilton, to Congress for the authorization of the construction of 10 revenue cutters to stop smugglers trying to evade payment of import taxes.

This gave birth to the Coast Guard and earned Secretary Hamilton the title of "The Father of the Coast Guard." Besides their smuggler interdiction duties, revenue cutter sailors had to battle pirates and privateers, and enforce U.S. quarantine laws.

As the nation grew, larger and more heavily armed cutters were built and used in the country's first war—the Quasi-War with France (1797-1801). In the 1800s, revenue

cutter sailors fought in the War of 1812, the Mexican-American War, the Civil War and the Spanish American War. For instance, in the War of 1812, the Revenue Cutter Vigilant captured the British privateer Dart, which had seized nearly 30 American vessels.

Revenue cutters fought on both sides of the Civil War. The Revenue Cutter Harriet Lane opened the Civil War's naval conflict, when it fired the first maritime shot at the steamship Nashville in Charleston Harbor.

A revenue cutter rescue at Cardenas Harbor, Cuba, was one of the most dramatic incidents in the Spanish-American War in 1898. While under fire from shore, the Revenue Cutter Hudson towed the damaged USS Winslow to safety.

The Life Saving Service, formed in 1848, and Bureau of Navigation, begun in 1838, became key to the service's safety mission. They eventually joined the Revenue Cutter Service and the Lighthouse Service,

begun in 1716, to form today's U.S. Coast Guard.

Federal lifesaving stations were first built in 1848 and daring surfmen carried out a number of dramatic rescues. In 1889, for example, Ramus Midgett single-handedly waded through the treacherous surf of North Carolina's Outer Banks to rescue all 10 passengers and crew from the barkentine Priscilla. The surfman even saved the ship's dog.

A key mission of the Lighthouse Service has been and continues today (under the auspices of the Coast Guard) to be accident prevention. Lighthouse keepers have guided ships into the nation's harbors since colonial times.

The Coast Guard's environmental responsibilities also have a long history. Beginning in 1890, the Revenue Cutter Bear introduced a herd of reindeer to Alaska to help supplement the Eskimo food supply. The International Ice Patrol was established after the sinking of the Titanic, and today, Coast Guard air-

craft still patrol the busy, fog-shrouded, ice-laden waters between the United States and England.

The modern Coast Guard began in 1915 when the Revenue Cutter Service and the Lifesaving Service merged and took the name Coast Guard. The Lighthouse Service joined in 1939. The Bureau of Navigation and Steamship Inspection Service joined in 1942.

The Coast Guard served during World War I, as well as in the Roaring '20s in the battle against rum runners.

During World War II, the Coast Guard underwent its greatest expansion, growing to more than 240,000 members. The vast majority were reservists. The Coast Guard played a vital role in the North Atlantic convoy duty and landed soldiers and Marines on the beaches during every major amphibious operation. Signalman First Class Douglas Munro, who lost his life rescuing a company of Marines at (continued on page 38)

Photo: The U.S. Coast Guard barque Eagle.

## Our Third Century

Admiral J.W. Kime, Commandant,  
United States Coast Guard

**Editor's Note:** Adm. John William Kime was recently named the 19th Commandant of the U.S. Coast Guard. He was nominated to the position while serving as Commander, Eleventh Coast Guard District, headquartered in Long Beach, Calif.

During that time he also served as the Commander of the Central California Sector of the U.S. Maritime Defense Zone, Pacific; and as Coordinator of the Pacific Region of the Pacific Region of the Office of National Drug Control Policy.

As the United States Coast Guard enters a third century of service to Americans, our future is as bright as it is challenging. Our anthem has a line that sums up our existence: "Semper Paratus (always ready) is our call." For two centuries of service, we have lived up to that goal.

Last year saw us answer the call many times. We answered the call from mariners in need of help 60,000 times. We answered the call to battle drug smugglers, and seized almost 33,000 pounds of cocaine and a quarter million pounds of marijuana. Whether it was destruction by hurricanes like Hugo, or earthquakes in San Francisco, Coast Guard men and women were there to help.

Just as we tried to save people from the environment, so we tried to save the environment from people. Large oil spills received national attention. But we also answered the call to another 8,000 oil and chemical spills last year. Large or small, the Coast Guard responded and did what we could. We can take pride in our accomplishments, but they are in the past.

Today we are working hard. Our men and women are knowledgeable and dedicated. Where do we go from here? Our watchword as we enter our third century must be balance. We must recognize that all of our operational missions are equally important.

We cannot forget our humanitarian tradition. We are first and foremost "the lifesavers." Our roots are found in the brave men and women who risked their lives so that others might live. Our technology will change, but our commitment to saving lives and property will not.

Our leadership in maritime law enforcement is well established. Unfortunately, drugs will continue to plague the nation as the Coast Guard enters its third century. Fisheries are growing in importance, and that will continue. Our role in these missions will continue to grow, and we will continue to build partnerships with the Office of National Drug Control Policy, Department of Defense, Customs Service, Drug Enforcement Administration, and National Marine Fisheries Service.

In the mid-1980s we assembled the right mix of interdiction re-

sources and virtually shut down large shipments of marijuana across the Caribbean. We went from two or three motherships a week, with 20-40-ton loads, to one or two ships a month, with 5 to 10-ton loads.

In the last 8-12 months, we have seen a dramatic decline in cocaine shipments across the Caribbean. Increased pressure in Colombia, increased Department of Defense resources have made the difference. We wholeheartedly welcome the other armed services into this effort. We have not won the war on drugs. But we are winning an important battle. We need to keep the pressure on the Caribbean, and be ready as the smugglers shift to new methods.

In the future, the environment will take on greater importance for the nation and the Coast Guard. We must maintain our leadership role in both the national and international areas. We will improve our oil spill response capability. But we must also improve our ability to prevent spills. Equal parts of the balance must be operational readiness and regulatory prevention. Keep the oil

in the ship if we can, but answer the call to clean it up if it gets out.

The Coast Guard needs to recognize the balance between operational and support functions. The pilots cannot fly to a rescue, the boat crews cannot search for drugs, and oil won't get cleaned up if the spare parts aren't ordered, the paperwork isn't completed, and the lawyers don't dot the "I's" and cross the "T's." Both elements need to be done right if we are to answer the call.

A good example of mission balance is the design of our new seagoing buoy tenders. The present fleet of 180-foot buoy tenders are all approaching 50 years of service—a good return on the taxpayers' dollars—but now the costs of maintenance and repair are getting prohibitive. These ships need to be replaced. Our engineers are working on a design for an oil-skimming capability. For the first time, this will provide the United States with an open-ocean skimming capability. These vessels will be scattered in ports around the country and put to work servicing aids to navigation.

When an oil spill occurs, they can respond instantly to begin a cleanup operation. They will be an important segment in the joint effort to protect our environment.

As this is being written, Congress is in conference formalizing an oil spill bill. The final form is yet unknown, but both the House and Senate versions contain increased responsibilities for the Coast Guard. More strike teams are needed to respond to spills. More vessel traffic systems are also required to prevent spills. Funding for equipment and personnel will need to be addressed, but it seems certain some form of this legislation will pass and be signed into law.

Our sister military services have been our partners in war and peace for many years. If changes in Europe cause the United States to draw down troop levels overseas, the importance of military sealift capability will grow. That means the Coast Guard's roles in port security and the maritime defense zone will remain part of our balance. As we have for our first two centuries, we will remain flexible and adapt to changing requirements.

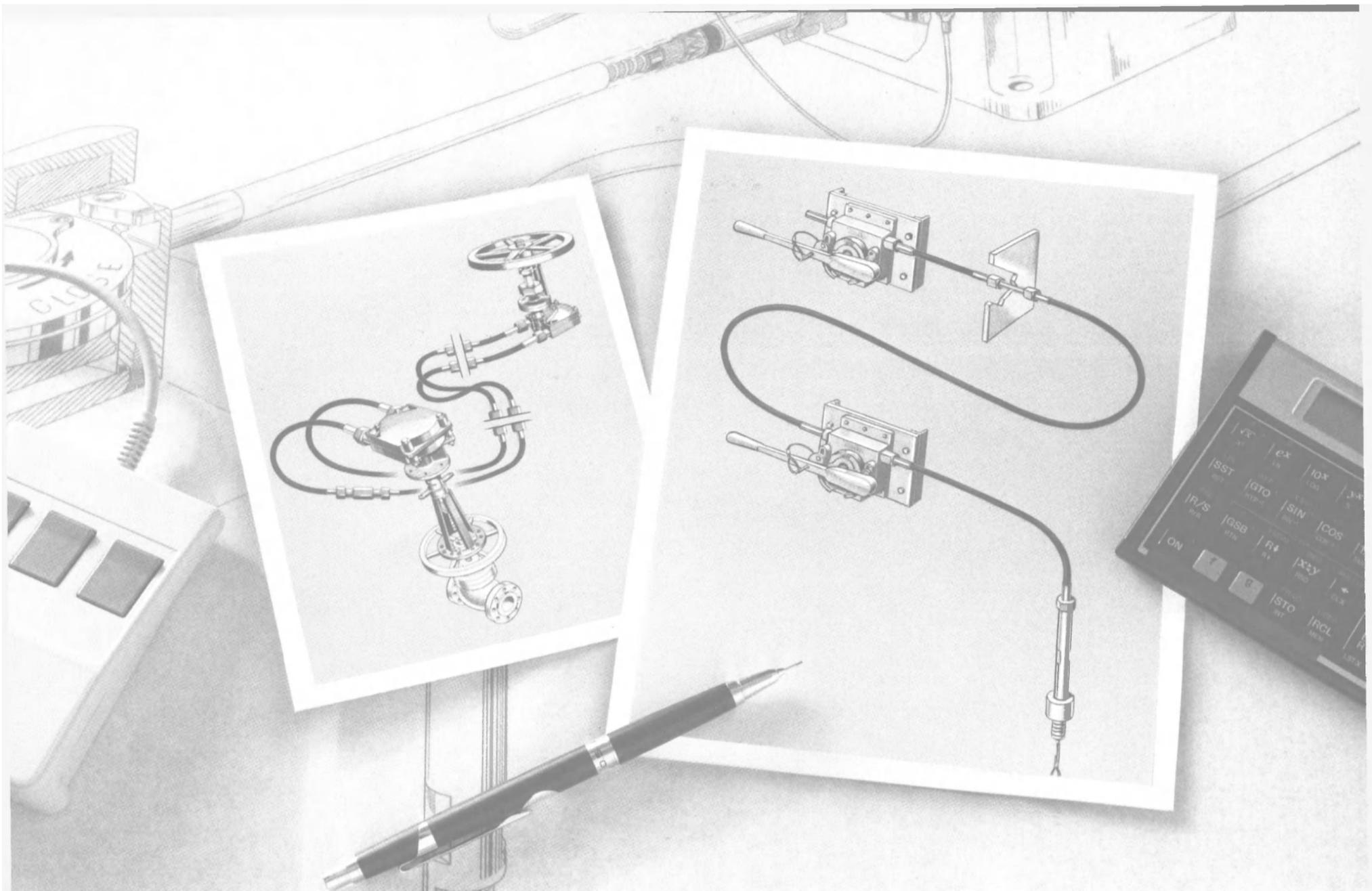
Drug interdiction, maritime safety, environmental protection, and national security are all important, but the most important element we need for balance is people. We ask a great deal of our Coast Guard men and women. They willingly go into harms' way for the good of others. They spend long hours serving their country, often separated from home and family for extended periods. Taking proper care of them is the top responsibility for their Commandant.

Most Coast Guard stations are small, 20-25 people. Many are in areas with no big military bases nearby, no commissaries or military hospitals. Most of our people don't have access to military housing. They are often stationed in resort areas because that is where the work is. But that is also an expensive place for a young seaman or petty officer to rent housing. We ask so much of them, we must ensure they get adequate housing and medical care. We must balance our operational needs with the needs of the people who answer our operation calls.

As we enter our third century, I see a strong Coast Guard with strong men and women carrying out vital missions. The future looks good. As always, there are challenges to be met and changes to be made. We have answered the call for two hundred years. The young men and women I have met throughout today's Coast Guard are our future, and they will uphold the great traditions of those who have gone before them.



Admiral J.W. Kime



Left: Remote Mechanical Valve Actuator. Right: Remote Trip Valve Actuator.

## ***RMVA, and now RTVA Teleflex designs solutions for Remote Valve Operation***

Engineering solutions aren't born. They're carefully designed. Consider RMVA, the Remote Mechanical Valve Actuator System from Teleflex, Inc. Naval Technologies Division.

The RMVA System serves as the industry standard for quality and performance in remote valve operation, and has been installed on virtually every ship class in the U.S. Navy.

Teleflex engineers solve problems using first-hand knowledge gained through years of experience on Naval vessels.

Teleflex has now found the solution to the problems long associated with Trip Valve Operators: the Remote Trip Valve Actuator System, or RTVA.

The RTVA System is designed first for survivability, as it eliminates shock-induced valve closures associated with the current cable/pulley systems.

The RTVA System is cost effective. It is completely sealed, permanently lubricated and corrosion resistant.

It's maintenance-free operation saves valuable manpower—allowing the ships' force to work on more critical tasks.

Design simplicity assures ease of installation with minimal labor requirements. Installation may be accomplished during overhaul, repair, or new construction.

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For RMVA Brochure, circle 319 on Reader Service Card. For RTVA Brochure, circle 320 on Reader Service Card.

# COAST GUARD

## Overview Of Coast Guard's Fiscal Year 1991 Request

As tensions ease abroad, the U.S. Coast Guard's role in defense readiness increases in importance. In addition, the service has a central role in several of the most crucial topics facing the U.S. today—marine safety, oil spill prevention and drug smuggling. The following is an overview of the Coast Guard's Fiscal Year 1991 Budget Request.

### Search & Rescue Operations

Search and Rescue (SAR) is one of the Coast Guard's oldest missions. Rescuing those in peril at sea has priority over all other Coast Guard peacetime missions. The Coast Guard keeps a nationwide system of boats, aircraft, cutters and rescue coordination centers on 24-hour alert, ready to respond to vessels in distress.

The Coast Guard operates a mix of cutters, boats, helicopters and fixed-wing aircraft. Table 1. shows the present fleet of vessels operated by the Coast Guard in U.S. coastal, harbor and inland waters.

As a result of Coast Guard SAR efforts between 1984 and 1988, more than 29,000 lives and \$4.8 billion in property were saved.

The Coast Guard has requested \$505.9 million for operating expenses for SAR, \$70.9 million for acquisition, construction and improvements (AC&I), and \$5.9 million for research, development, test and evaluation.

Items of particular interest listed by the Coast Guard to effectively conduct its SAR operations in FY 1991 are: motor lifeboat replacement acquisition, the 378-foot heavy endurance cutter (WHEC) FRAM (Fleet Rehabilitation and Maintenance), and 210-foot medium endurance cutter (WMEC) MMA (Midlife Maintenance Availability).

### Environmental Protection

Perhaps the hottest topic in the news, marine environmental protection is one of the Coast Guard's top priorities. Marine environmental response and port safety and security are the two major missions of the Coast Guard's marine environmental protection program.

As part of marine environmental response, the Coast Guard must minimize damage caused by pollutants released in the coastal zone and reduce the threat of spills of oil or hazardous substances.

Besides safeguarding shoreline property and facilities as part of port safety and security, the service must monitor oil transfer and hazardous cargo operations to prevent spills.

The Coast Guard has requested a

total of \$222.3 million for operations, acquisition, construction and improvements and research in this area. Among the topics under discussion are the acquisition of National Strike Force equipment and research into pollution response.

### Law & Treaty Enforcement

Between 1984-1988, the Coast Guard confiscated nearly 4,300 tons of marijuana, 42,800 pounds of cocaine, seized 854 drug smugglers' vessels and issued more than 2,500 citations for fisheries law violations.

The Coast Guard has requested \$1.07 billion in operating, acquisition and research funds for FY 1991. Among the main areas of interest are the patrol boat capability replacement, the WHEC FRAM, WMEC MMA, and the development and evaluation of electro-optical sensor systems for USCG vessels.

### Ice Operations

In the area of polar and domestic ice operations, the Coast Guard has requested \$112 million in the FY91 budget. Polar icebreaker reliability

Vessel Type	Length (in feet)	Number
High Endurance Cutters	378	12
Medium Endurance Cutters	180-270	38
Surface Effect Ships	109	3
Buoy Tenders	65-180	79
Harbor Tugs	65	14
Icebreaker Tugs	140	9
Icebreakers	290-400	3
Patrol Boats	82-110	98
Training Cutter	295	1
Small Craft	16-63	2,000
<b>TOTAL FLEET—</b>		<b>2,257</b>

improvement project, boat and cutter survey and design, C<sup>3</sup> systems development and design (shipboard tactical information systems and local area network for cutters), the development of covert telecommunications and encryption systems and video sensor data transmission systems are among the major areas included in this program.

### Aids To Navigation

The Coast Guard has requested a total of \$546.4 million in the FY91 budget for the aids to navigation

program. Under AC&I, the service hopes to replace its current coastal and oceangoing buoy tender fleet.

### Marine Safety

The Coast Guard's marine safety program consists of two major activities: commercial vessel safety and recreational boating safety. The service has requested a total of \$165.7 million to support such programs as marine fire research and development and fire safety engineering methodology in cutter design and modification.

Table 2.—Overview of Coast Guard's Budget Authority Funding History

(Dollars in millions)	1984 Actual	1985 Actual	1986 Actual	1987 Actual	1988 Actual	1989 Actual	1990 Enacted	1991 Request	+/(-) 90/91
Operating Expenses (1)	\$1,690.5	\$1,753.6	\$1,747.9	\$1,907.3	\$1,909.1	\$2,122.4	\$2,210.3	\$2,391.4	\$181.1
Acquisition, Construction and Improvements (2)	669.0	374.2	453.8	543.0	267.0	435.8	444.2	419.5	(24.7)
Environmental Compliance/Restoration (3)	—	—	—	—	—	—	—	7.0	7.0
Reserve Training	55.4	59.2	58.9	64.4	62.9	67.0	71.6	78.9	7.3
Research, Development, Test and Evaluation	22.5	23.0	17.8	20.0	19.0	18.8	20.5	23.0	2.5
Alteration of Bridges (4)	8.6	13.6	5.0	0.0	0.9	13.5	2.3	—	(2.3)
Boat Safety Account	12.5	28.6	33.1	32.6	22.5	29.0	29.9	30.0	0.1
Retired Pay	315.2	330.8	339.5	356.0	386.7	410.8	420.8	437.3	16.5
Pollution Funds	5.8	9.4	5.9	6.8	5.2	31.0	5.7	5.7	—
Miscellaneous Funds	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	—
<b>TOTALS:</b>									
Current Dollars	\$2,779.5	\$2,592.4	\$2,661.9	\$2,930.1	\$2,673.3	\$3,128.3	\$3,205.3	\$3,392.9	\$187.6
Constant 1991 Dollars	\$3,478.0	\$3,147.7	\$3,153.6	\$3,386.6	\$2,987.4	\$3,357.9	\$3,316.8	\$3,392.9	\$76.1
(1)	Includes from DOD: \$115.0 in 1986; \$90.0 in 1987; \$105.0 for "services-in-kind" and \$3.0 for 100 LEDETS in 1988; \$140.0 for "services-in-kind," \$60.0 "cash" and \$6.0 for 200 LEDETS in 1989; \$140.0 for "services-in-kind" and \$160.0 "cash" in 1990. Includes from Boat Safety: \$15.0 in 1986 and 1987; \$21.6 in 1988; \$30.0 in 1989; \$29.9 in 1990; and \$30.0 in 1991. Includes \$12.0 in new BA in 1988 from FY88 \$60M Reprogramming Supplemental. Includes \$16.0 in 1989 from Anti-Drug Abuse Act of 1988. Includes \$4.5 transfer from Acquisition, Construction & Improvements in 1989.								
(2)	Includes from DOD: \$300.0 in 1984; \$235.0 in 1986; \$245.0 in 1987; and \$20.0 from Coastal Defense Augmentation Account in 1988. In 1989: includes \$50.3 MilCon Appropriation for Shore Facilities and \$100.0 from Anti-Drug Abuse Act of 1988; reflects transfers of \$4.5 to Operating Expenses and \$5.0 to Alteration of Bridges.								
(3)	Prior to FY 1991, activities of this nature were included in the Acquisition, Construction & Improvements appropriation.								
(4)	Includes \$5.0 transfer from Acquisition, Construction & Improvements in 1989; legislation is pending to transfer this program to the Corps of Engineers. If transfer legislation is not enacted, \$6.4 will be required to fund this program in FY 1991.								

## Defense Readiness

The service has requested a total of \$138.8 million for defense readi-

ness. Some requested funds would be put toward WHEC FRAM, WMEC MMA and a WHEC weapons system installation, as well as coastal defense support and port

safety and security research.

## Summary

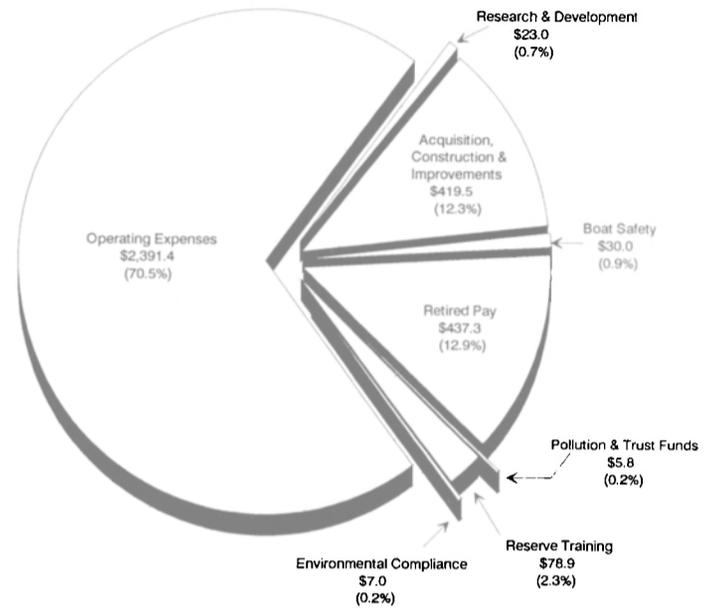
The 1991 budget strategy provides sufficient resources for the Coast Guard to maintain current operations. AC&I resources for continuation of the renovation and

modernization programs for the 378-foot and 210-foot cutters, and C<sup>3</sup> systems upgrades are intended to maintain the Coast Guard's capability to track, intercept, and apprehend smugglers. A number of initiatives are proposed in OE to support operation of equipment provided in previous budget years. ■

Table 3—Highlights of FY91 Budget Request

Program	\$ Amount (In millions)
<b>Vessels</b>	<b>\$162.2</b>
WLB Replacement Project	\$ 2.2
44-ft. MLB Replacement Project	\$ 1.0
Patrol Boat Capability Replacement	\$ 5.5
WLM Replacement Project	\$ 3.1
Construction of ATON Barges - 9th District	\$ 6.4
Replacement Buoy Boats	\$ 5.6
Tactical Data Information System	\$ 1.8
378' WHEC FRAM	\$78.2
210' WMEC MMA	\$32.5
Service Life Extension Project (SLEP)	\$20.0
Polar Class Icebreaker Reliability Improvement - Phase III	\$ 2.7
378' WHEC Weapons System Modernization	\$ 3.2
<b>Command, Control &amp; Communications &amp; Related Systems</b>	<b>\$24.5</b>
Replace AR&SC Computer System - Phase III	\$ 1.5
GPS Installation - Phase II	\$ 1.6
Configuration Management	\$ 6.0
Upgrade NORPAC Loran-C Stations - Phase 1	\$ 6.0
Marine Safety Information System Replacement (MSIS II)	\$ 2.5
Computer for Service Record Automation	\$ 1.2
Vessel Identification and Documentation System	\$ 2.2
Law Enforcement Information System Improvements	\$ 1.8
Personnel Management Information System/Joint Uniform	
Military Pay System II	\$ 1.7
<b>AC&amp;I Program Support</b>	<b>\$36.5</b>
Personnel and Related Costs	\$30.5
Survey and Design - Boats and Cutters	\$ 1.0
Survey and Design - Shore Construction	\$ 5.0

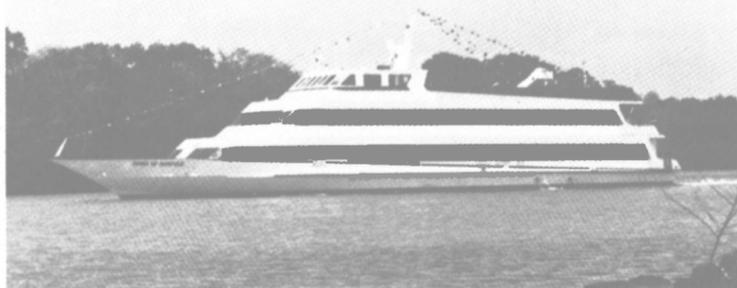
1991 Budget Request by Appropriation



Total Request: \$3,392.9  
(Dollars in millions)

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## COAST GUARD

(continued from page 33)

Guadalcanal, was awarded the Medal of Honor. He was the only coast-guardsmen so honored.

By the end of World War II, the Coast Guard was a true multimission service. It broke ice, marked rivers, helped with flood relief, and continued ocean patrols, aiding ships and planes in distress and providing vital weather information.

Ice operations expanded after the war. In 1957, the cutters Storis, Bramble and Spar began Arctic ice operations by crunching through the Northwest Passage. This proved that ships that were building the Distant Early Warning Line, a series of radar stations, could escape to the east if necessary.

Coastguardsmen fought on foreign shores once again, during the Vietnam War, to block seaborne supply routes. With Coast Guard cutters patrolling, a small wooden sampan had only a small chance of getting through, while a steel-hulled vessel had none at all.

During the 1970s, a series of oil tanker accidents led to an expansion of the Coast Guard's marine safety mission. The Coast Guard created Pollution Strike Teams and greatly increased the ship inspection and pollution monitoring programs.

The 1980s opened with a nonstop search and rescue case—the Cuban boat lift. More than 225,000 Cubans

jammed into boats of every conceivable size, shape and condition and fled Cuba for the United States. Many had to be rescued.

In 1980, Coast Guard pilots assisted by U.S. Air Force and Canadian pilots carried out one of the most dramatic helicopter rescues in history. When the cruise ship Prinsendam caught fire off the coast of Alaska, helicopters flew to the limit of their range and saved all of the more than 500 passengers and crew.

The Coast Guard Auxiliary has been a vital part of the service's safety mission. Since it was formed in 1941, the auxiliary has taught boating safety courses to thousands of people, conducted numerous boat safety inspections, and assisted the Coast Guard with search and rescue efforts.

The Coast Guard was started as a law enforcement agency and in the 1980s, the service is still at it. The Coast Guard enforces fisheries laws in the frigid New England and Alaskan waters and stops illegal migration in southern waters.

Stopping entry of illegal drugs is the Coast Guard's largest law enforcement mission today. The Coast Guard has intercepted thousands of cargoes of marijuana and cocaine.

As it begins its third century of service, the Coast Guard remains Semper Paratus—Always Ready—to enforce U.S. laws and respond to future challenges in the maritime region. ■

## Major Navy Contracts

Compiled by Maritime Reporter Staff

**Unisys Corporation**, Great Neck, N.Y., was awarded a **\$9,500,000** firm-fixed-price contract for the AN/SPG-55B radar refurbishment for CG 21, CG 28 and CG 32. Work is expected to be completed in March 1991. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-5637).

**Avondale Industries, Inc., Shipyard Division**, New Orleans, La., was awarded a **\$24,441,592** fixed-price with performance fee incentive contract for the Regular Overhaul (ROH) of USS Stump (DD 978). Work is expected to be completed in July 1991. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-85-H-8113).

**Norfolk Shipbuilding & Drydock Corporation**, Norfolk, Va., was awarded a **\$25,271,481** fixed-price with performance fee incentive contract for the Regular Overhaul (ROH) of USS Briscoe (DD 977). Work is expected to be completed July 15, 1991. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-85-H-8195).

**Bay Ship Management, Incorporated**, Englewood Cliffs, N.J., was awarded a firm-fixed-price plus reimbursables contract for the operation and maintenance of eight fast sealift ships. The contract performance period is three years, with two one-year options. The firm-fixed-price portion totals **\$73,927,864** for all five years. Work is expected to be completed by August 1, 1993. The Military Sealift Command, Washington, D.C., awarded the contract (N00033-90-C-4008).

**General Electric Company, Naval & Drive Turbine Systems**, Fitchburg, Mass., was

awarded an **\$11,810,960** firm-fixed-price letter contract for ship service turbine generator sets for SSN 21 class submarines. Work is expected to be completed in February 1993. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-4066).

**FMC Corporation, Naval Systems Division**, Minneapolis, Minn., was awarded a **\$9,609,000** cost-plus-award-fee contract for design agent technical engineering services for the MK-41 Vertical Launching System (VLS) Program in support of CG 47, DDG 51 and DD 963 class ships. Work is expected to be completed December 31, 1990. This contract combines purchases for the U.S. Navy and the governments of Japan and Australia under the Foreign Military Sales Program. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-3206).

**AT&T Technologies, Inc.**, Greensboro, N.C., was awarded a **\$25,366,901** modification to a previously awarded cost-plus-fixed fee contract for oceanographic services. Work is expected to be completed August 30, 1990. The Space and Naval Warfare Systems Command, Washington, D.C., awarded the contract (N00039-90-C-0087).

**Newport News Shipbuilding**, Newport News, Va., was awarded a **\$38,400,000** cost-plus-fixed-fee contract for research and development work for advanced class submarines. Work is expected to be completed September 30, 1990. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-2900).

**NASSCO**, San Diego, Calif., was awarded a **\$6,647,165** cost-plus-award-fee contract to exercise an option for USS Peoria (LST 1183) under the Phased Maintenance Program. Work is expected to be completed March 30, 1990. The Supervisor of Ship-

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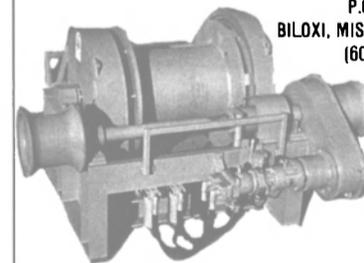
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Maritime Reporter/Engineering News

building, Conversion and Repair, San Diego, Calif., awarded the contract (N00024-85-C-8502).

**Metro Machine Corporation**, Norfolk, Va., was awarded a **\$25,595,172** firm-fixed-price contract for the New Threat Upgrade, Regular Overhaul of USS Wainwright (CG 28). Work is expected to be completed August 30, 1991. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-85-H-8187).

**Ingalls Shipbuilding, Inc.**, Pascagoula, Miss., was awarded a **\$12,158,193** cost-plus-award-fee modification for the first option period of follow yard services for DDG 51 class follow ships. Work is expected to be completed December 14, 1990. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-88-C-2252).

**Unisys Corporation**, Salt Lake City, Utah, was awarded a **\$5,934,921** modification to a previously awarded firm-fixed-price contract for 12 OJ-172 data exchange auxiliary consoles for destroyer and frigate class ships. Work is expected to be completed in October 1992. This contract combines purchases for Taiwan, Japan, Germany and Spain under the Foreign Military Sales program. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-85-C-7004).

**Raytheon Company, Submarine Signal Division**, Portsmouth, R.I., was awarded a **\$6,680,808** firm-fixed-price contract for 4,220 transducers for SSN submarines. Work is expected to be completed in December 1994. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-6088).

**General Instrument Corporation, Underseas Systems Division**, Westwood, Mass., was awarded a **\$12,874,140** firm-fixed-price contract for transducers and hydrophones for SSN submarines and surface ships. The base year (FY-90) is for **\$1,460,519** with options for FY-91 through FY-94 totalling **\$11,413,621**. Work is expected to be completed by December 1994. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-6101).

**Norden Systems, Inc.**, Melville, N.Y., was awarded a **\$6,768,692** firm-fixed-price modification for seven AN/SPS-67(V)3 radars and associated materials and services for DDG 57 through DDG 63. Work is expected to be completed in August 1993. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-89-C-5616).

**Avondale Industries, Inc., Shipyard Division**, Avondale, La., was awarded a **\$104,429,334** fixed-price-incentive contract for detail design and construction of T-AGS 45, an oceanographic survey ship. Work is expected to be completed in October 1992. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-2307).

**General Dynamics Corporation, Electric Boat Division**, Groton, Conn., was awarded a **\$31,496,351** cost-plus-fixed-fee contract modification for design agent services for Ohio class submarines. Work is expected to be completed February 28, 1994. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-2115).

**Robert E. Derecktor of Rhode Island, Inc.**, Middletown, R.I., was awarded a **\$7,303,009** option exercise to a previously awarded firm-fixed-price contract for one large tug for the U.S. Army. Work is expected to be completed June 14, 1992. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-88-C-2136).

**Kollmorgen Company**, Northampton, Mass., was awarded an **\$8,975,954** firm-

fixed-price contract for three optical sights for DDG 51 class ships. Work is expected to be completed November 30, 1991. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-5655).

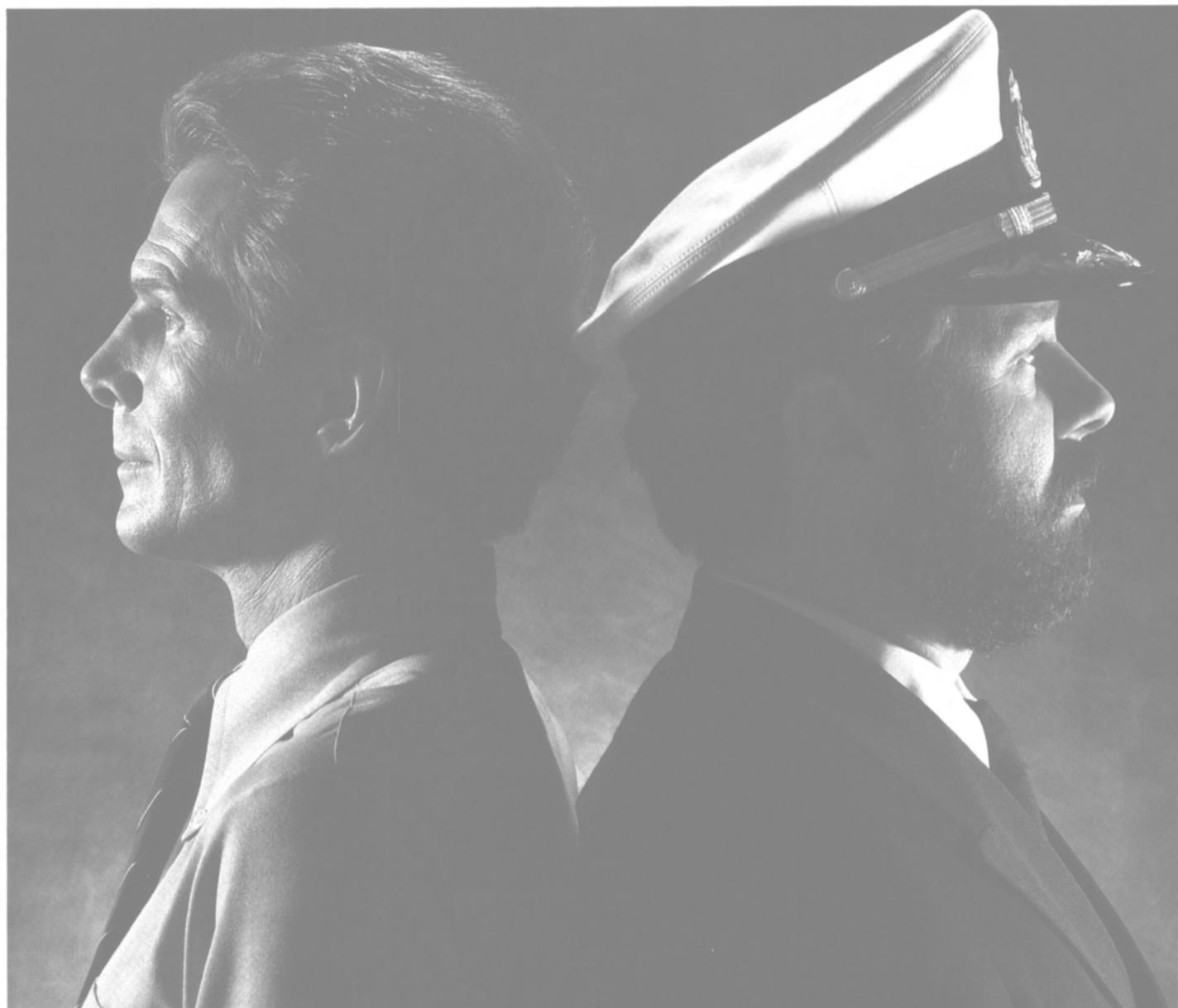
**Israel Military Industries**, Chevy Chase, Md., was awarded a **\$17,402,798** firm-fixed-price with incentive fee contract for 256 MK-13 Mod 0 and 218 MK-14 Mod 1 canisters for the MK-41 vertical launching systems of DDG 51 and DD 963 class ships. Work is expected to be completed in June

1992. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-3216).

**Raytheon Company, Equipment Division**, Wayland, Mass., was awarded a **\$41,254,618** fixed-price-incentive contract for NATO Seasparrow Surface Missile Systems (NSSMS) for LHD and AOE class ships. Work is expected to be completed in December 1993. This contract combines purchases for the U.S. Navy and the governments of Norway, Italy, Germany and Turkey. The Naval Sea Systems Command,

Washington, D.C., awarded the contract (N00024-90-C-5145).

**Raytheon Company, Equipment Division**, Wayland, Mass., was awarded an **\$83,912,679** firm-fixed-price contract for five shipsets of Aegis weapons system SPY transmitter and MK-99 fire control system auxiliary equipment for DDG class ships and various Aegis battle spares. Work is expected to be completed in November 1993. The Naval Sea Systems Command, Washington, D.C., awarded the contract (N00024-90-C-5144).



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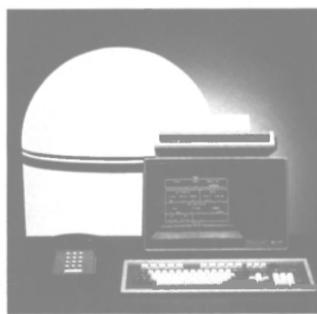
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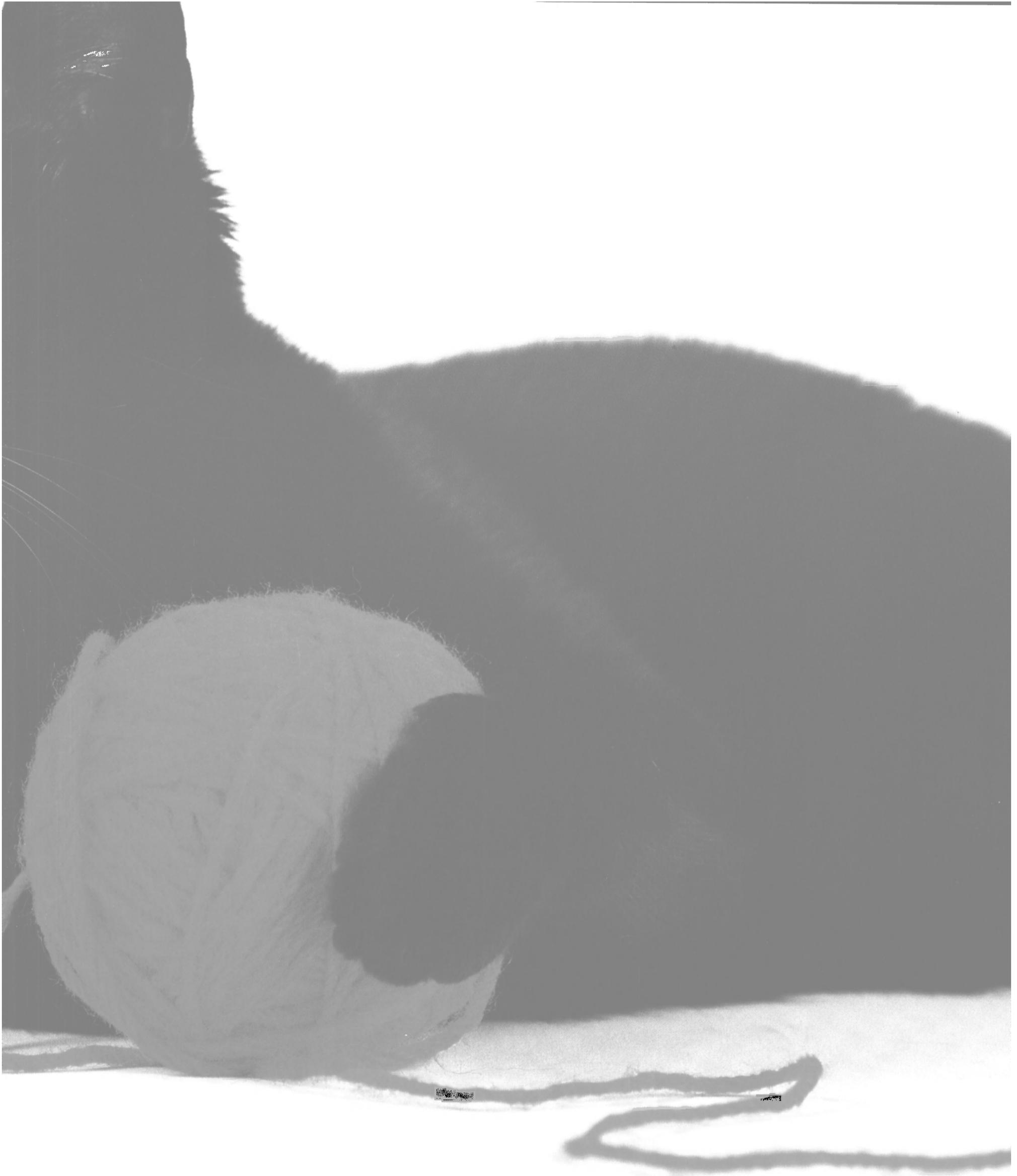
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## BOATS & BARGES



Willard Marine's 18-foot RIB at speed.

### Willard Marine Continues Work With U.S. Coast Guard; Introduces SOLAS-Approved 18-Foot RIB

California-based Willard Marine Inc., a leading manufacturer of fiberglass planing-hull and rigid inflatable boats for the U.S. Coast

Guard and U.S. Navy for over 30 years, will introduce its new SOLAS-approved 18-foot Rigid Inflatable Boat, or RIB, at the New

Orleans Work Boat Show in November.

The new RIB is a smaller version of its 24-foot RIB which the U.S. Navy is using to replace many of its 26-foot whaleboats aboard various U.S. naval ships.

Like the 24-foot version, Willard Marine's newest RIB is an open craft with a rigid fiberglass hull and a rubberized inflatable collar. The 18-foot RIB is powered by a Kodiak 3.3D diesel marine engine which develops 98 horsepower coupled to a Kodiak 120 Waterjet drive. It can carry up to eight people or a medium size load.

In comparison, the 24-foot RIB is powered by Cummins' 6BT5.9-M in-line, six-cylinder turbocharged diesel which develops 210 horsepower and is coupled to a SternPower 113E126LL stern drive. The 24-foot RIB can carry up to 18 people.

"We're very excited about our 18-foot RIB," said **Bob Percy**, president of Willard Marine, who explained the reasoning for the smaller RIB: "We've seen great success with the 24-foot RIB and felt there was a need for a lighter, smaller rescue craft that was even easier to transport but shared the same stability and safety features as the larger craft. We take pride in the fact that Willard Marine builds the only U.S.-made RIB that's SOLAS-approved." Over the years, Willard Marine has constructed several vessels for the Coast Guard, including fifty-six 32-foot ports and waterways boats for harbor patrol and

firefighting, and 22 smaller, self-righting craft for ocean surf rescues. For the Navy, Willard Marine has constructed scores of 24-foot RIBs, 50-, 40-, and 33-foot utility boats and 40- and 33-foot personnel boats. Willard Marine's boats are used at naval and Coast Guard installations throughout the country.

Willard Marine's RIBs are constructed with high-quality fiberglass and an inflatable collar that is mechanically fastened to the hull. The collar is constructed of heavy polyester-weave fabric and has a neoprene-hypalon coating for extra durability.

"The Coast Guard has found them to be excellent rescue craft," **Rod Swift**, vice president of Willard Marine pointed out. "They're light and can easily be transported by aircraft or trailered to a rescue or oil-spill site. They're very stable as a work platform because of the buoyancy collar, and the soft gunnels prevent victims from becoming injured during open sea rescues."

Besides its use by the U.S. Coast Guard, Willard Marine envisions two primary commercial applications for its RIBs in the future. First, for marine rescue operations performed by municipalities, and the offshore oil industry, and second for rapid responses to oil spills.

For free literature from Willard Marine giving complete information on the new RIB,

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## BOATS & BARGES

### Bollinger Receives \$73.4-Million Modification To Build USCG Patrol Boats

Bollinger Machine Shop & Shipyard, Inc., a family-owned builder located on Bayou Lafourche outside of New Orleans, recently received a \$73.4-million modification to a previously awarded firm-fixed contract to construct twelve 110-foot Island Class patrol boats.

The new contract is a follow-on to one awarded by the Coast Guard to Bollinger in 1987. The original contract for sixteen 110-foot patrol boats had been awarded to the yard in 1984. Although these vessels are for the Coast Guard, they are being procured by the Navy under Congressional direction. With the present award, a total of 49 Island Class patrol boats have been contracted at Bollinger.

The WPB 110-foot Island Class patrol boats will be outfitted with ZF's BW-755 transmissions. ZF has received orders for 26 of the transmissions from Caterpillar, manufacturer of the engines for the boats.

The 12 new boats will be 110 feet

long, with a 21-foot beam and a 7-1/3-foot draft. Standard displacement will be 141 tons. Each boat will be powered by two Cat 3516-DITA engines, capable of providing 2,740 bhp at 1,910 rpm. The BW-755 transmissions will provide a 2.33:1 reduction ratio. The Island Class patrol boats will attain an estimated speed of 26 knots.

The Island Class is principally designed for offshore surveillance and search-and-rescue operations. It is capable of maintaining high speeds in heavy seas.

The first of the new patrol boats is scheduled for launch in December 1990. ZF Marine transmissions were also specified for the 37 Island Class patrol boats previously built for the Coast Guard.

Adm. **K.G. Weiman**, Coast Guard Chief of Engineering, said in a letter for newspaper syndication, "With regard for Bollinger Shipyard, it is without doubt the finest boatbuilder we have ever done busi-



The USCG patrol boat Farallon, first of the Island Class built by Bollinger Machine Shop & Shipyard, is powered by two Paxman Valenta engines.

ness with."

According to Bollinger, working with the Navy and the Coast Guard has dramatically improved its facility. Some of the services and facilities available from Bollinger Larose and Lockport yards include: new construction, quality assurance, engineering, gas-freeing, plasma cutting and welding. Bollinger has on-site machine, propeller, aluminum, electrical/electronic, hydraulic, carpenter, and mechanic shops.

Bollinger recently acquired Algiers Iron Works & Dry Dock Co., Inc., New Orleans, La., which spe-

cializes in the offshore and workboat sectors. The company will operate as a wholly owned subsidiary of Bollinger.

Over the past 40 years, Bollinger has constructed 168 vessels, ranging from exploration and research vessels, oilfield supply vessels, drill rigs and jack-up boats to oceangoing vessels, deck barges, tugs, push boats and fishing vessels.

For free literature detailing the facilities and services of Bollinger Machine,

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## \$15 Million Subcontract To Tracor For Navy Surface Ship Programs

Tracor Applied Sciences, Austin, Texas, a subsidiary of Tracor, has been awarded a subcontract by Vredenburg of Reston, Va., to provide engineering and technical services to the Naval Sea Systems Command (NAVSEA 63Y1) in the areas of antisubmarine warfare (ASW) systems and programs. Tracor's share of this five-year contract is approximately \$15 million.

K. Bruce Hamilton, Tracor Applied Sciences Group vice president, announced that the company will provide engineering services to support the design, installation, test and evaluation, and life-cycle maintenance of surface ship in-service ASW systems. Tracor has been providing similar support to NAVSEA 63Y1 since 1978.

## PacOrd To Install New Threat Upgrade On Two Navy Cruisers

PacOrd, a member of the Philadelphia-based SPD Technologies family of companies, has been selected to install the New Threat Upgrade (NTU) on two CG-26 class cruisers.

NTU is designed to upgrade the Anti-Warfare capabilities of the U.S. Navy's older cruisers and guided missile destroyers. It entails extensive modernization of the Terrier Missile system and replacement of the majority of the ship's search radar systems and Naval Technical Data computer installations.

PacOrd has extensive experience with NTU, starting with the 1987 overhaul of the USS Mahan (DDG-42), the Navy's prototype for NTU.

PacOrd's newest NTU jobs will be on board USS William H. Standley (CG-32) at Northwest Marine Iron Works in Portland, Ore., and USS Wainwright (CG-28) at Metro Machine in Norfolk, Va.

For nearly 40 years PacOrd has been an important full-service combat systems contractor supporting the U.S. Navy through private shipyards, DoD contracting agencies and OEMs.

For literature describing PacOrd's available services and applications,

Circle 55 on Reader Service Card

## D. W. Pryor Appointed At Diversified Technologies

Naval architecture and marine engineering firm Diversified Technologies has recently appointed David W. Pryor as senior engineer responsible for commercial ship and U.S. Navy non-combatant ship support programs. Mr. Pryor has 11 years' experience in marine design and analysis and was Chief Engineer with Colonna's Shipyard before joining Diversified Technologies.

## Morgan Crane Receives Order For Knucklebooms For Three Corvettes

Since its recent product line expansion and move to new facilities, Morgan Crane Company, Inc., Santa Ana, Calif., has received several government and commercial orders.

Among the orders received by

Morgan Crane, which now offers articulating cranes from 1- to 75-ton capacities, are installations aboard SWATH oceanographic research vessels T-AGOS-20, -21 and -22, and AGOR-23, the NOAA ships Delaware 2 and Oregon 2, and several commercial merchant vessels.

A recent order includes three 60-ton knuckleboom cranes with 14,000-pound constant tension winches installed. This equipment will

be state of the art, from the high speed constant tension winches to the special digital remote control system. These large knuckleboom cranes will be installed on the SA'AR 5 Class corvettes being built by Ingalls Shipbuilding, Inc., Pascagoula, Miss., for Israel.

For free literature detailing the full range of cranes offered by Morgan Crane Co.,

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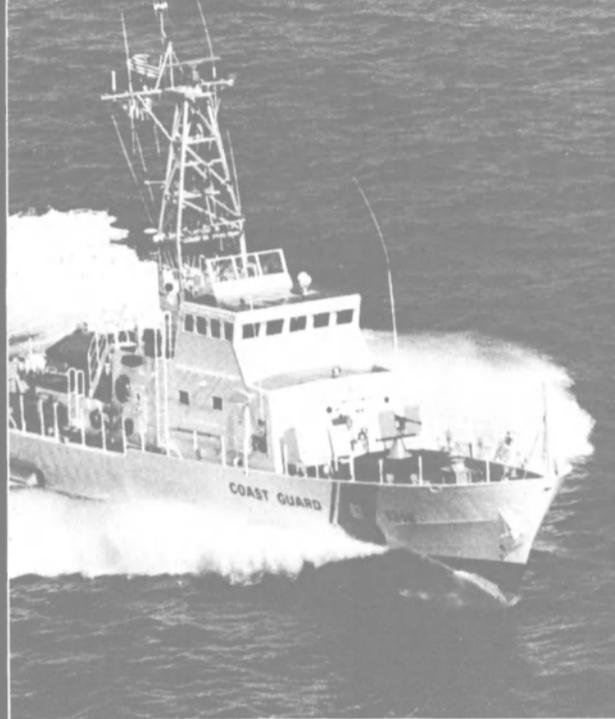
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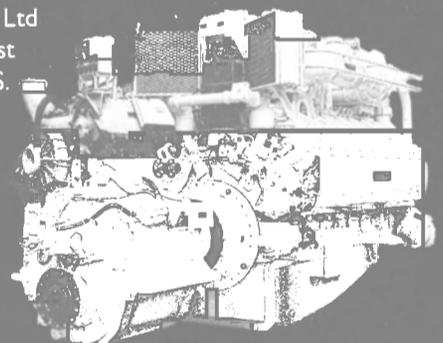
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## CONGRATULATIONS TO THE U.S. COASTGUARD SERVICE

Paxman Diesels Ltd extend their best wishes to the U.S. Coastguard Service on the occasion of their Bicentenary.

The U.S. Coastguard Fleet of 37 110ft. Island Class cutters are powered by the Paxman Valenta diesel engine some within excess of 8,000 operational hours. Now with some 74 Paxman engines in service in these vessels, the U.S. Coastguard Service looks forward to another century. Paxman are proud of their association with the U.S. Coastguard Service.



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## New Navy Report Outlines Potential Submarine Threat From Third World Nations

A new U.S. Navy report, "Anti-submarine Warfare: Meeting the Challenge," outlines what it calls the emergence of "a significant ASW problem" from Third World and nonaligned nations with submarine forces. The report, therefore, represents a major shift from the Navy's almost exclusive focus on the Soviet threat.

According to the 72-page report, the availability of modern diesel-electric submarines combined with the latest in torpedo and cruise missile technology make the submarine forces of Third World and non-aligned nations an increasingly more potent threat.

Of the two dozen countries cited in the report, only China and India have nuclear-powered submarines among their forces. The rest of forces of the Third World and non-aligned nations outlined are composed of diesel-electric submarines, some of which are the new air-independent propulsion type.

The emergence of modern, relatively inexpensive, air-independent propulsion technology has turned diesel-electric submarines into true submersibles.

The report states, "Able to stay submerged for extended periods, using these new propulsion systems to recharge their batteries without noisy snorkel operations, hybrid-diesel submarines equipped with modern cruise missiles and torpedoes are a significant ASW problem. The

availability of this technology to Third World and nonaligned nations will make ASW a major consideration in future low-level regional conflicts."

Because of the ready availability of these quiet submarines, as well as the existence of quieter Soviet submarines, the Navy report stresses the need for the development and funding of various Antisubmarine Warfare (ASW) programs in the years ahead in order to maintain an edge in underwater surveillance operations.

Among the ASW programs cited by the report for continued support include: advanced underwater vehicles for submarines, improvement of SQQ-89 sonar for surface ships, refinement of bi-static and multi-static active sonar systems for surface ships, advanced active and passive sonobuoys for patrol aircraft, upgrade of the mobile passive sonar system, and deployment of a fixed active system.

Some of the newest class of ASW platforms in the U.S. include the Arleigh Burke Class (DDG-51) Aegis destroyer, the improved version of the Los Angeles Class (SSN-688) attack submarine, the new Seawolf Class (SSN-21) submarine, and the Small Waterplane Area, Twin-Hull (SWATH) T-AGOS ocean surveillance ship with the Surveillance Towed Array Sensor System (SURTASS).

## Avondale Awarded Navy \$24.4-Million Contract For Destroyer Overhaul

The U.S. Navy has awarded a \$24.4-million contract to Avondale Industries, Inc. for the overhaul of the Spruance Class destroyer USS Stump (DD-978) at Avondale's main yard in New Orleans, La. The announcement was made by Senator **J. Bennett Johnston**, Congressman **Bob Livingston** and Congresswoman **Lindy Boggs**, members of the Appropriations Committee.

The repair and overhaul work will be performed at the company's main yard and at its Algiers facility. The contract will require about a year to complete.

Avondale Industries, Inc. is one of the nation's leading marine fabricators. In addition to its shipbuilding operations, the company specializes in boat and LCAC construction, and is a major repair contractor for commercial and Navy ships.

For further information regarding Avondale Industries' service capabilities,

Circle 98 on Reader Service Card

## US Navy Homeports Select Seaward Marine Fenders

Seaward International, Inc. has recently received its largest order ever for the supply of foam-filled marine fenders to the U.S. Navy. The order was placed by Firth Construction Company of Baton Rouge, La., who was awarded the prime construction contract from the Naval Facilities Engineering Command to supply and install the homeport fender systems.

Over 75 Sea Guard® model netless fenders, ranging in sizes from 4 by 8 feet to 8 by 16 feet, will be delivered for installation at the new U.S. Naval homeports in Ingleside, Texas, Pascagoula, Miss. and Pensacola, Fla. Included in this purchase are special high-capacity Sea Guard fenders, measuring 6 by 20 feet, which will be installed on fabricated steel used to berth aircraft carriers at the Pensacola and Ingleside locations.

The completion of this order will bring to five the number of Sea Guard fenders which have been or will be installed at Navy homeports: Eleven fenders are to be installed in Mobile, Ala., and 28 fenders are already in place at the new Navy facility in Staten Island, N.Y.

For more information on fenders available from Seaward International,

Circle 113 on Reader Service Card

## NASSCO Wins \$233,372 Contract For USS Schenectady

National Steel and Shipbuilding Company, San Diego, Calif., was recently awarded a \$233,372 cost-plus-award-fee contract for advance planning work for the Drydocking Phased Maintenance Availability of the USS Schenectady (LST-1185) for fiscal year 1991. The work will be performed in San Diego, and is expected to be completed by mid-January 1991.

The contract includes options for advance planning and production work for nine availabilities over the next five years. If exercised, these options could amount to nearly \$44 million for NASSCO. The expected completion date for all availabilities is in May of 1995.

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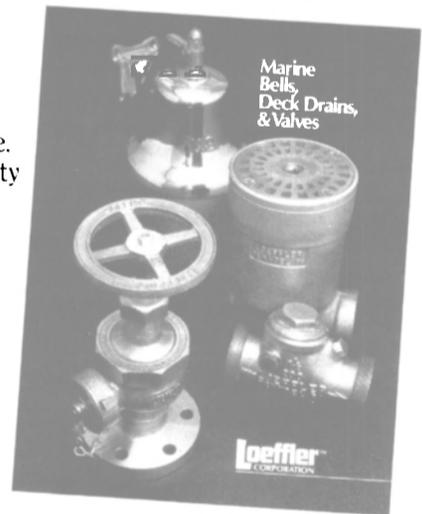
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**SPD Technologies Names  
Daniel J. Schuster  
Director of Marketing**



Daniel J. Schuster

Daniel J. Schuster has been named director of marketing for SPD Technologies, a leading developer of electrical protection and control systems for naval applications. In his new position he will be responsible for worldwide marketing of SPD's line of circuit breakers, switchgear and electronic battery monitoring systems as well as new products now in development.

Mr. Schuster had previously directed the company's service center operations and business development. He joined the company in 1976.

SPD Technologies is one of the largest producers of military circuit breakers and a world leader in advanced electrical protection equipment. The company is also heavily involved in providing ship control and interior communication systems designed for U.S. Navy ships. SPD, which is headquartered in Philadelphia, has service and repair facilities across the U.S. and serves military markets throughout the world.

**NORSHIPCO Completes  
Conversion of Crane  
Ship (T-ACS 9) For Navy**

The Navy's newest crane ship, SS Green Mountain State (T-ACS 9), was named recently during a ceremony at Norfolk Shipbuilding and Drydock Corporation, in Norfolk, Va.

The ship, named for the state of Vermont, will be under the operational control of the Navy's Military Sealift Command.

The principal speaker at the ceremony was Senator **James M. Jeffords** (R-Vt.); his wife **Elizabeth** was the ship's sponsor. Capt. **Thomas P. McGuire**, USN, Commander, Military Sealift Command, Middle Atlantic, represented the MSC and spoke at the ceremony.

Green Mountain State is 665.7 feet long with a 75 foot beam. With an operating draft of 27 feet, her displacement is 22,900 long tons.

When not in operation, Green Mountain State will be assigned to the Ready Reserve Force. When called into service, she will carry a

total crew of 69 and can be fully activated within five days of notification.

The conversion of ex-Mormacaltair, a general cargo/container ship built in 1965 and jumboized in 1976, to the crane ship SS Green Mountain State began in February of 1989. The conversion included the installation of two 60-ton twin-

boom cargo cranes with two 1,200-kilowatt diesel generators to provide the electrical power to operate them, a cargo crane control room for operations, major modifications to the cargo holds, the installation of approximately 4,500 long tons of ballast to compensate for the crane weights and the installation of small craft mooring fittings on the ship's

hull above the waterline. Green Mountain State is the fourth crane ship converted for the Navy by NORSHIPCO.

For free literature outlining NORSHIPCO's construction and repair services,

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88-043

## Tano Marine Named Single System Vendor For T-AGS 45

Tano Marine Systems, Inc., New Orleans, La., has been named the Single System Vendor (SSV) responsible for integration of the complete propulsion system for a new oceanographic survey ship. The contract was awarded by Avondale In-

dustries, Inc., Shipyards Division.

Under the contract, Tano received the SSV designation for the T-AGS 45 survey ship, which will be built by Avondale Industries, Inc., in New Orleans for the U.S. Navy, for operation by the Military Sealift Command.

As SSV, Tano will be responsible for overall engineering design, integration, selection of equipment suppliers, sensor interfaces, regulatory body approval and procurement for

the integrated electric machinery plant, including the centralized engine room and ship control system. Tano will also design and manufacture the ship's bridge and engine room consoles, remote data gathering units to collect data across the ship, and remote alarm panels.

For more information on Tano's automation and control systems and applications,

Circle 21 on Reader Service Card

## MSC Awards \$73.9-Million Contract To Bay Ship Management

The Navy's Military Sealift Command awarded a firm-fixed-price plus reimbursables contract totaling \$73,927,864 to Bay Ship Management, Inc., Englewood Cliffs, N.J., for the operation and maintenance of eight Fast Sealift Ships: USNS Algol, USNS Altair, USNS Antares, USNS Bellatrix, USNS Capella, USNS Denebola, USNS Pollux, and USNS Regulus. The contract is for three years with two one-year options. The two option years are included in the fixed price.

Before they were awarded the contract, Bay Ship Management, Inc., was responsible for the operation and maintenance of four of the Fast Sealift Ships.

## Marinette Marine Launches Its Third MCM Vessel USS Patriot (MCM-7)



The USS Patriot (MCM-7) is launched at Marinette Marine.

Marinette Marine Corporation, Marinette, Wis., recently launched its third mine countermeasure ship, the USS Patriot (MCM-7).

The Mine Countermeasure Ship is a new design, designated the "Avenger" class. The ships are 224 feet in length, have a beam of 37 feet, a draft of approximately 11 feet, and a full load displacement of about 1,300 tons. They are equipped with the latest state-of-the-art combat systems equipment designed to search and destroy mines. The system includes the AN/SQQ-30(V) mine-hunting sonar, the EX1 MOD 0 mine neutralization system, and a precise navigation system (AN/SSN-2[V]). The ships carry a complement of 81 crew and officer personnel and are designed to operate independently in any area of the world for an indefinite period.

In preparation for the launch, the ship was moved from its construction site in Marinette Marine's Ship Erection Building to the designated launch site, approximately 900 feet away. The vessel, which weighed in at over 900 tons at launch, was literally "walked" to the site supported by Marinette's Dual Walking Beam, a computer-controlled, hydraulically operated 1,600-ton capacity transfer system.

For more information on Marinette Marine's services and facilities,

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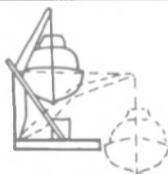
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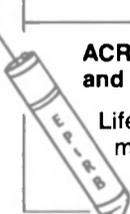
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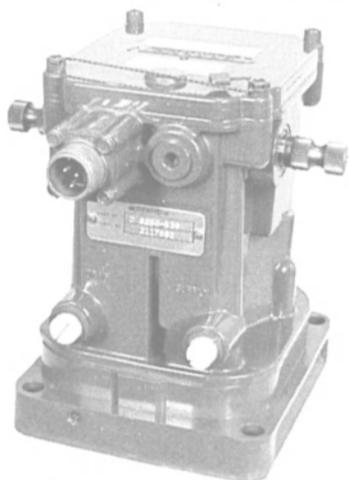
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## Louis T. Codega Joins Blount & Associates

Louis T. Codega has joined the firm of Donald L. Blount & Associates, located in Norfolk, Va., as a senior naval architect. He will be specializing in design and engineering management for very high performance craft and marine equipment.

A professional engineer registered in Virginia, Mr. Codega received his B.S. degree from Webb Institute of Naval Architecture and his M.S. degree in Naval Architecture and Marine Engineering from Massachusetts Institute of Technology. He served as a naval architect with the U.S. Coast Guard and Naval Sea Combat Systems Engineering Station. At present, he is chairman of the Power Craft Panel for the Society of Naval Architects and Marine Engineers, and is a member of the Small Craft Committee.

## Literature Available On New Engine Actuator From Woodward Governor



Woodward Governor's new Universal Actuator can handle diverse applications with ease and precision.

There is a new alternative available for users of combustion engines who demand plenty of muscle from the actuator they use. Woodward Governor has introduced a new Universal Actuator (UA) -10/20P which can handle diverse applications with ease and precision.

The UA-10/20P converts a given electrical signal to a proportional, linear or rotary output-shaft position intended to control the flow of fuel to a prime mover.

Among the advantages new to this actuator are: high resistance to vibration; 44-degree rotary or 1-inch linear output; 10 or 20 ft-lbs of work capacity; UG-, PG- and EG-style base options; non-driven, hydraulic pressure input base available for remote mounting; and output action proportional to input signal.

The actuator can be mounted vertically or horizontally without changing calibration and it is compatible with most Woodward electronic controls.

For complete literature on the new engine actuator,

Circle 135 on Reader Service Card

## Two Boston Whaler Sentry-Class Workboats Purchased For Lake Patrol

The Mohave County Sheriff's Office in Arizona has purchased two Boston Whaler Sentry-Class workboats for patrol, search, and rescue operations on Lake Havasu.

Products of the Boston Whaler Commercial Products Division, these new 22-foot Sentry models are among a fast-growing number of high-quality boats designed and produced by Boston Whaler, Inc. to serve a variety of police, government, and commercial markets.

Specially equipped for this kind of duty, these new Sentry 22s incor-

porate a number of improvements, including the use of heavy-duty fiberglass laminate for durability in high-speed pursuits or unintentional groundings.

On duty 16 hours a day, seven days a week, each boat is powered by a 285-hp inboard/outboard unit.

For further information and free literature on Boston Whaler,

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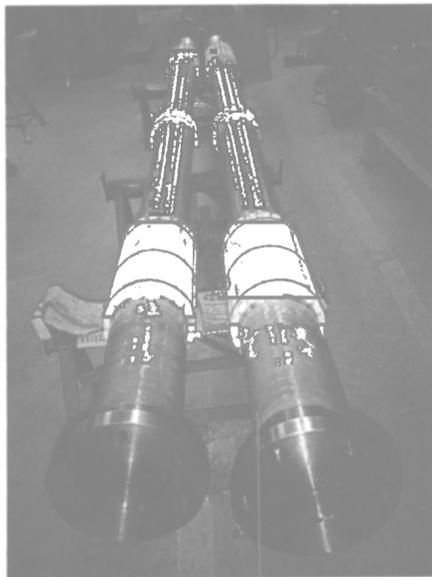
## Essex Machine Works Delivers New Steel Propeller Shafts For Coast Guard's 'Eagle'

Essex Machine Works, Inc., Essex, Conn., recently delivered new forged steel propeller shafts for America's Tall Ship, the barque Eagle, to the Coast Guard base at Governor's Island, N.Y.

According to **Wilson W. Cross**, president of Essex Machine Works, Inc., a new shaft will be installed on the Eagle when she is hauled out for her normal refit later this year.

When not under sail, the 295-foot-long Eagle, which serves Coast Guard Academy instructors and cadets as a seagoing classroom, utilizes her 16-cylinder, 1,000-hp Caterpillar diesel engine to drive her at about 10 knots. Turning an eight-foot-diameter propeller, her new shaft is almost nine inches in diameter, over 20 feet long and weighs 1.8 tons. Her new shaft will replace what is believed to be one installed more than 50 years ago at her launching.

The Eagle bears a name that goes back to the early history of the United States' oldest continuous seagoing service. The first Eagle was commissioned in 1792, just two years after the formation of the Revenue Marine, forerunner of the Coast Guard.



The finished shafts coated with fiberglass and epoxy to protect them from salt-water corrosion.

The present Eagle, the seventh in a long line of vessels to bear the name, was built as the German naval training vessel Horst Wessel in 1936 by the Blohm + Voss Shipyard in Hamburg, Germany. In May 1946, she was taken as a war prize by the U.S. and commissioned into the

U.S. Coast Guard as the Eagle.

In making the decision to award the contract for the new shafts, the Coast Guard was seeking a supplier with not only the right machining skills and cost efficiency, but also with the practical understanding of marine propulsion systems that would be required to bridge the half-century change from the ways of the pre-WWII German Navy to present-day needs of a demanding—but safe and efficient—cadet training ship.

Essex Machine has completed the work machining the shafts (one for installation and one for stand-by spare). The surfaces of the shafts were also coated with fiberglass and epoxy to protect them from salt-

water corrosion.

The original drawings in German, as produced by the Blohm + Voss designers 54 years ago, were translated and redrawn to current standards by **Drew Dickson**, sales engineer at Essex Machine, and **Robert M. Wilkinson**, a consulting naval architect on the project.

The entire manufacturing process, which included shaft fabrication, fitting of wear-resistant bronze sleeves, and machining of one-foot-diameter bronze propeller nuts, was completed at the Essex Machine work shop in Essex.

For free literature on the machining services of Essex Machine Works,

Circle 88 on Reader Service Card

### Viking Seminar Updates Skills of Service Representatives

Continuing its focus on service excellence, Viking Life Saving Equipment, Inc., recently sponsored a servicing school for technicians and trainees from throughout North and South America.

During the seminar, students reviewed proper service techniques for Viking life rafts. This included recommended procedures for testing and packing the raft, proper repair methods and correct inspection techniques.

Viking offers the week-long class

annually to update and train their service representatives. The program, held at Viking's U.S. headquarters in Miami, was conducted by **Jens Peter Bie**, worldwide service manager for Viking. Mr. Bie is from the company's headquarters in Esbjerg, Denmark.

Viking is a leading innovator in the production of state-of-the-art lifesaving equipment. The company is a long-time supplier of U.S. Coast Guard-approved SOLAS life rafts, buoyant apparatus, survival suits and other lifesaving equipment to commercial and recreational mariners.

For free literature detailing Viking lifesaving equipment,

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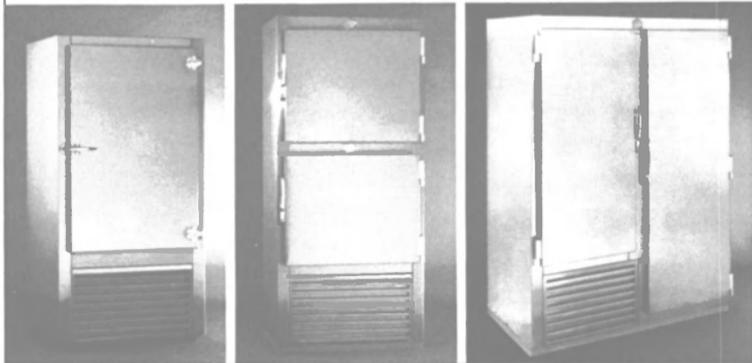
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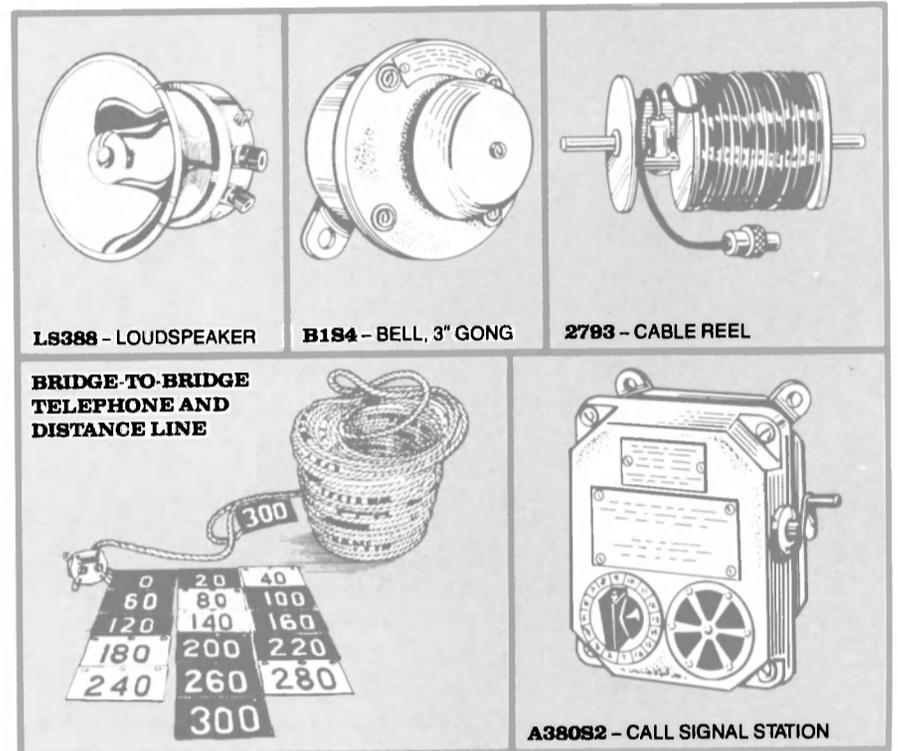
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Maritime Reporter/Engineering News

# U.S. NAVY IC PRODUCTS



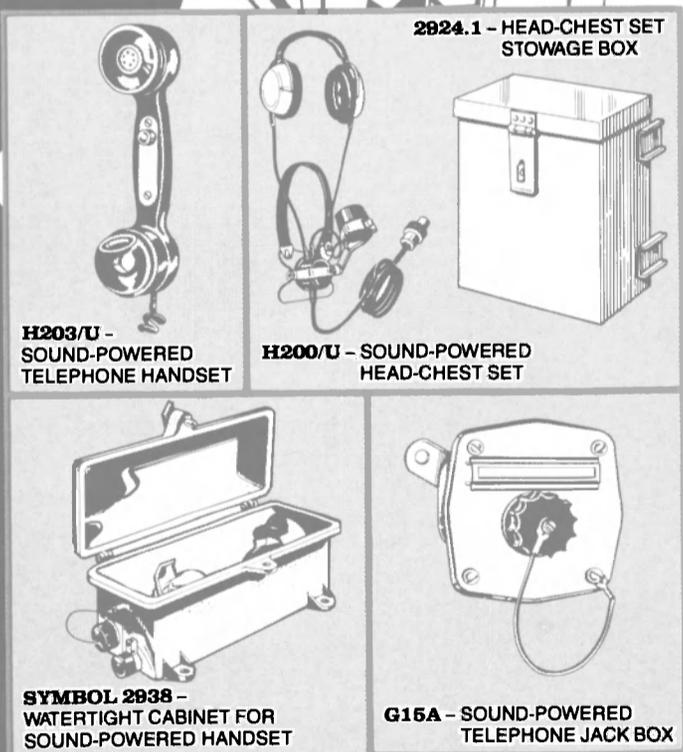
LS388 - LOUDSPEAKER

B194 - BELL, 3" GONG

2793 - CABLE REEL

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A380S2 - CALL SIGNAL STATION



H203/U -  
SOUND-POWERED  
TELEPHONE HANDSET

H200/U - SOUND-POWERED  
HEAD-CHEST SET

2924.1 - HEAD-CHEST SET  
STORAGE BOX

SYMBOL 2938 -  
WATERTIGHT CABINET FOR  
SOUND-POWERED HANDSET

G15A - SOUND-POWERED  
TELEPHONE JACK BOX

Hose-McCann Telephone Co., Inc., originators and pioneers of Sound-Powered Telephones for marine use, has expanded their product line to include a wide variety of U.S. Navy Electrical and Mechanical products. An assortment of these products are shown here. All Hose-McCann Navy Products are manufactured, tested, and qualified in accordance with the latest Military specifications.

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Circle 245 on Reader Service Card

## Marine Lubricants

(continued from page 30)

needs of all types of marine equipment.

For crosshead engines, Texaco offers TARO Special, a premium quality cylinder lubricant for large, slow-speed diesels burning residual fuels. It is blended from highly refined paraffinic base oils and oil soluble additives to produce a high alkaline reserve (70 TBN) product with good lubricant film strength. It is approved by all of the major crosshead engine builders. It is specially formulated to prevent corrosive wear and minimize ring deposits.

Taro Special EX 85 is a premium quality cylinder lubricant specifically developed to meet the requirements of Sulzer RLB engines. It has provided excellent performance in field tests and is approved by Sulzer for those applications where an 85 TBN product with a viscosity of 24 cst at 100 degrees C is specified.

DORO AR 30 (SAE 30) is a premium crankcase lubricant for large, slow-speed engines. It is blended from highly refined solvent neutral oils and carefully selected additives to produce a moderate alkaline reserve (6 TBN) oil. This product offers unusually good rust and corrosion protection, wear protection and water separation characteristics. DORO AR 30 meets the Sulzer requirement for engines equipped with PTO units.

Texaco offers a complete line of trunk piston engine oils for medium- and high-speed diesels. The specific lubricant required would be based on the sulfur content of the fuel being used in the engine. TARO XD oils, with a TBN of 15 minimum, are used in engines burning fuel with a sulfur content up to 1.8 percent. TARO DP oils, with a TBN of 30 minimum, are specifically designed for trunk type engines utilizing fuel with sulfur in excess of 1.8 percent. TARO XD and TARO DP are available in SAE 30 and SAE 40 viscosity grades. TARO XL 40 (SAE 40) is for use in medium-speed engines where the operating conditions or fuel sulfur content requires a 40 TBN product.

All of these oils are blended from carefully refined base oils fortified with specially developed additive packages to give excellent performance even under the most severe operating conditions. They have been extensively tested both in the laboratory and in the field. TARO XD, DP and XL 40 all offer excellent TBN retention and anti-corrosion properties. They are formulated with selected detergent and dispersant additives which minimize piston ring deposits, improve overall engine cleanliness and provide long in-service life.

Texaco supports its marine lubricants with prompt, efficient technical service and the Texlube used oil analysis program for monitoring the condition of the oils in use.

## UNITOR

Circle 130 on Reader Service Card

The marketing of fuel treatments by Unitor Ships Service A/S has recently been dramatically strengthened by the acquisition of supplier Gamlen Chemical Company. Unitor marine chemicals are now drawn from the combined resources and expertise of both Perol-

in Marine, long known for its fuel treatments, and Gamlen Chemical Co. The result is a highly efficient and cost-effective range of fuel treatments, cleaners, and water treatments.

Unitor offers treatment products for such fuel handling system problems as sludge, water contamination, corrosion and bacteria/fungi.

A fuel conditioner such as Unitor's Fuelcare is effective

against sludge formation in unstable fuels. The instability can have been caused by aging or long term heating, or by mixing incompatible fuels aboard.

Sludgy fuels often entrain water, thus by dispersing existing sludge and by preventing incompatibility, water contamination can be re-

(continued)



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Circle 208 on Reader Service Card

## Marine Lubricants

(continued)

leased for removal by settling/centrifuge.

Corrosion is prevented by the filming action of the fuel conditioner. The additive also chemically neutralizes acids in the fuel.

Where bacteria/fungi are present, it is first necessary to remove as much water as possible from the fuel and then to treat with a biocide. The biocide Bioclean is a "broad spectrum" biocide, meaning it is effective in killing a wide range of bacteria and fungi, an essential requirement for fuels since exact type of bio-activity is often not known.

Water contamination, especially saltwater contamination, in fuel can cause costly problems during combustion, such as high temperature corrosion of engine components by ash deposits. Fortunately, high temperature corrosion and ash deposition problems can be treated with additives such as Burnall or Cleanburn, which are effective in both these areas. With the use of a fuel conditioner these problems as well as storage tank and pipeline corrosion can be avoided.

Unitor also offers Gamabreak, a versatile and effective water demulsifying additive.

### VERITAS PETROLEUM

Circle 86 on Reader Service Card

Veritas Petroleum Services (USA), Inc., Teaneck, N.J., has been offering a Blend Optimization Program (BOP) to its customers for almost three years. Veritas's experience indicates that many operators in the program were using 50 percent MDO in their BFO. With BOP,

they have been able to consistently meet all quality targets using on average only 30 percent MDO. Without BOP and a fixed blend recipe, blended fuels frequently will exceed one or more specification parameters.

According to Veritas Petroleum Services, assuming an \$80 ton premium, an operator that uses three tons blended fuel oil per day can expect to reduce his annual fuel costs by about \$10,000 per vessel.

Many vessel operators engage in on-board blending of marine residual fuel and diesel fuel to produce a blended fuel for auxiliary engines. This practice became much more prevalent after the substantial price increase for petroleum products in the 1970s. Indeed a variety of commercial blending units are available to the marine operator for this purpose. For operators who do on-board blending the key question is, "How much diesel fuel is required so that the resulting blended fuel meets the auxiliary engine builders fuel specification limits?" Surprisingly, many operators don't ask this question, and fewer still know the answer. Before this question is answered a number of general observations on blended fuel quality and cost are required.

(1) The key quality parameters of a blended fuel are almost exclusively due to the heavy fuel component. Specifically, these include carbon residue, ash, abrasive particles, vanadium and sodium. The MDO component of the blend has a negligible impact on these qualities. The MDO only influences density and viscosity. Viscosity alone is not a quality parameter.

(2) Heavy fuels can vary very widely in all these characteristics. This variation is found between suppliers within a single port, and is not necessarily consistent over time for a single supplier.

(3) It is bad economics to use too much distillate fuel. The cost of blended fuel is directly related to the amount of MDO used. The equation for determining this cost is as follows: Blended Fuel Cost (\$/Ton) = HFO price + (% MDO) Distillate Premium/100, where distillate premium is the cost difference between MDO and HFO.

The more MDO in the blend, the higher the price. For example, at \$100/ton HFO and an \$80/ton distillate premium, a 50 percent blend would cost \$140/ton while a 30 percent blend would cost \$124/ton.

The operator's objective is to meet the builder's blended fuel spec while using the minimum amount of distillate fuel. To optimize a blend, the operator must know the following:

(1) Before blending, the operator should make sure the components are compatible. There is only one way to reliably do this, and that is to mix the actual components and run the appropriate test on the blended fuel;

(2) The engine builder's spec limits should be known in order to target qualities for the blended fuel;

(3) A complete analysis on the HFO must be obtained;

(4) The vis and density of the MDO must also be known.

The following simple example serves to illustrate the above points. Assume that the engine builder's carbon residue limit is 10 percent maximum. For simplicity, let us assume he is blending with clean MDO. To meet the MCR limit of 10, he would require a blend with 41.2 percent MDO if the HFO has an MCR of 17, but only 9.1 percent MDO if the HFO MCR was 11, and 0 percent MDO if the MCR was less than or equal to 10. The answer to the question posed above is that each fuel is different, and so is each optimized blend. ■

## Schoellhorn-Albrecht Names Rheams Gulf Area Sales Manager



Stephen P. Rheams

**Robert Pavlisin**, vice president of Schoellhorn-Albrecht Machine Company, a St. Louis-based marine deck equipment manufacturer, has named **Stephen P. Rheams** as Gulf area sales manager in Luling, La.

Mr. **Rheams** will represent the firm's products and services to the inland and offshore marine industries in regions of Texas, Louisiana, Mississippi, Alabama and Florida.

Bringing 10 years of experience in the marine industry to his new position, Mr. **Rheams** is a past vice-president of the Greater New Orleans Barge Fleeting Association and was director of the group's River Industry Seminar for the past two years.

Schoellhorn-Albrecht, co-owned by Mr. **Pavlisin** and **Norman Morgan**, is a manufacturer, distributor and repair facility for capstans, winches and deck fittings, serving the inland and coastal waterways with offices in St. Louis and New Orleans, La.

## MSI Offers 12-Page, Full-Color Brochure On Facilities And Capabilities

MarineSafety International (MSI) is offering a free 12-page, full-color brochure on its facilities and capabilities.

MSI provides man-in-the-loop simulation for research and training to government agencies and to the maritime industry. The company operates ship simulators at Kings Point, N.Y., and Newport, R.I. Engine room and cargo-handling simulators are located at LaGuardia Airport and the State University of N.Y. Maritime College, Ft. Schuyler, N.Y.

MarineSafety's state-of-the-art simulator facilities are complemented by experienced ships' masters, hydrodynamicists, psychologists and computer scientists who make up the instructional and research staffs.

For further information and a free copy of this well-illustrated, informative brochure from MarineSafety,

Circle 42 on Reader Service Card

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CABINS 300-345	↑
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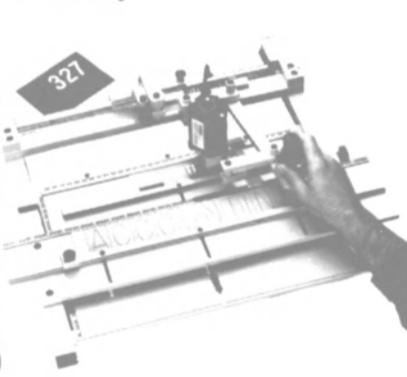
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Circle 225 on Reader Service Card

## Wartsila Diesel Names Ocean Power & Equipment Northeast Representative



Richard A. Russell

Chestertown, Md.-based Wartsila Diesel, Inc. has announced the appointment of Ocean Power & Equipment, Inc. as its exclusive representative in the Northeast. Ocean Power will primarily be responsible for selling Wartsila Diesel's heavy-fuel-burning medium speed diesel engines to the marine industry in Connecticut, Massachusetts, New Jersey, New York and Pennsylvania.

Ocean Power is a partnership between **Richard A. Russell** and Keppel Marine Agencies of Mountainside, N.J. Keppel Marine Agencies is the U.S. representative for the Keppel Group in Singapore as well as the A&P Appledore Group, the Arno Group of France, Neorion Shipyard, Gibraltar Shipyard, Conastil Shipyard, Scamp and Metalock.

Mr. **Russell** graduated from the U.S. Merchant Marine Academy in 1966. His most recent position was as a vice president with W.B. Arnold Co., with sales responsibilities for marine equipment in the Northeast.

## Five Voith Water Tractors Ordered By Humber Tugs

Humber Tugs Ltd., Hull, England, a subsidiary of Howard Smith (UK) Ltd., an investment arm of Howard Smith Australia, has placed an order with the British shipyard McTay for the delivery of five Voith water tractors. These vessels reportedly will be the most powerful Voith water tractors for operation in British ports.

The five Voith water tractors will be equipped with the latest ship-handling and firefighting equipment and will be designed to safely handle and protect VLCCs, chemical tankers, large bulk carriers and other vessels using the Humber port river terminals and enclosed docks.

The 630-ton tractor tugs will have a waterline length of 93½ feet, a molded beam of 36 feet, and draft 16½ feet. Each vessel will be equipped with two Voith-Schneider propellers, model 32G II/200, each driven by a 2,367-hp diesel engine. The tugs will have a bollard pull 50 tons minimum, with a free-running speed of 12 knots minimum.

For more information on Voith products,

Circle 45 on Reader Service Card

July, 1990

## Global Marine Group Changes Company Name To GMG Systems, Inc.

Global Marine Group, Inc. has changed its name to GMG Systems, Inc. The new GMG Systems, Inc. name reflects the expansion of the company's product lines and services of both marine and commercial activities. The company has recently extended its marine efforts to

the design, supply and installation of Vapor Recovery Systems which will be mandatory for both foreign and U.S.-flag vessels calling at U.S. ports, after June 1990. The expected compliance period will be through June 1991, and will be implemented on a worldwide basis following that.

This new program is an extension of the company's recent activities since its formation in early 1988 to market and execute engineered

package systems including design, installation, surveying and service as related to international environmental and safety requirements. In order to accommodate this expansion, the company has announced its relocation, effective July 1, 1990, to newer and larger quarters in New Hyde Park, N.Y.

For further information and free literature,

Circle 17 on Reader Service Card



## When You Look At Everything You Put Into A Barge, You Should Expect A Lot Out Of It.

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Circle 248 on Reader Service Card

## BOATS & BARGES



Considerable effort was expended in designing the R.B. Young to provide a quiet and comfortable habitat for both crew and scientific personnel.

### Robert Allan-Designed Hydrographic Survey Vessel Delivered By Allied Shipbuilders

Allied Shipbuilders Ltd. of North Vancouver, B.C., Canada, recently delivered the hydrographic survey

vessel R.B. Young to the Canadian Department of Fisheries and Oceans, following a successful and

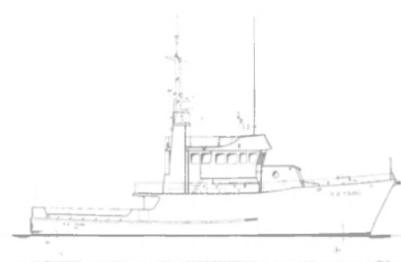
extensive series of trials.

The vessel was built to a design by Robert Allan Ltd., Vancouver, originally prepared in 1984, and later updated prior to the awarding of a construction contract in 1988.

The R.B. Young will be based at the Institute of Ocean Sciences, Sidney, B.C., and will conduct coastal hydrographic survey work throughout the coastal waters of British Columbia. She is equipped with the very latest in scientific equipment for the performance of this work, and was designed and equipped so that upgrading and modernizing of electronic data recording and analytical equipment could be readily accomplished.

The vessel is of all-welded steel construction, with an aluminum wheelhouse, all constructed in accordance with the rules and under survey of the American Bureau of Shipping. The hull is of simple, double chine form, with a fine entry, full stern, and relatively full midsection. A full height forecastle extends nearly 60 percent of the length of the vessel, leaving an open aft deck for a variety of equipment, depending upon the nature of work to be performed. Possible configurations include either two 8-meter survey launches, in davits, or hydrographic winches and stern gantry.

Vessel propulsion is by twin CP propellers, each driven by a high-



Profile drawing of the R.B. Young.

speed marine diesel engine through a reduction gearbox. Installed machinery includes the following: main engines, Cat Model 3406, each rated 322 bhp at 1,800 rpm; gearbox, Hundested Model CPG 32, 4:1 reduction ratio; and CP propellers, Hundested, four-blade, 1,300-mm diameter.

Electrical power is provided by two 1,200-rpm Cat 3306 diesel generators, each supplying 95 kw of power at 240/3/60. Power stabilization is provided on all circuits supplying scientific systems.

The R.B. Young has accommodations for 11 persons—six ship's crew and five scientific mission staff.

For free literature on naval architects Robert Allan Ltd.,

Circle 27 on Reader Service Card

For more information and free literature on the facilities and capabilities of Allied Shipbuilders,

Circle 28 on Reader Service Card

## BOATS & BARGES

### Aluminum Boats Constructing 140-Foot Dinner Yacht For Chicago

Aluminum Boats, Inc. of Crown Point, La., is constructing an all-aluminum, 140-foot, 350-passenger dinner yacht, the Anita Dee II, for Tee Dee Enterprises, Inc., which has operated smaller charter vessels in Chicago for over 12 years.

Designed by Aluminum Boats, Inc., its parent company, the Trinity Marine Group, and yacht design consultant Alfred (Jay) Coyle Jr., the Anita Dee II maximizes space on the two primary passenger decks—main and second—by eliminating stanchions or supports.

Atop is the flybridge which includes a lounge with fixed cocktail seating for 62, dance floor with bandstand, bar and promenade area. A helipad is also located on the flybridge.

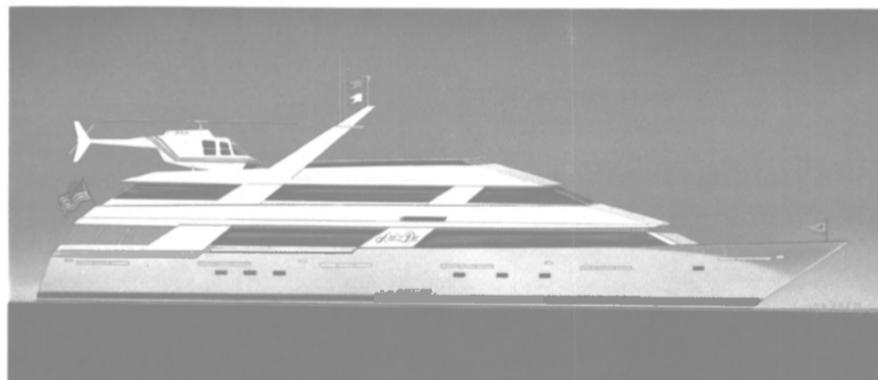
Below decks, the Anita Dee II will have four staterooms, separate crew quarters, a captain's stateroom with bath, quarters and bath for two, and a changing area and lockers for the chef and waiters.

The Anita Dee II will operate in Chicago during the summer to mid-October, and in the winter from the Bahia Mar Resort and Yachting Center in Ft. Lauderdale, Fla., from mid-November to mid-March.

As the contract called for only

#### ANITA DEE II Equipment List

Main engines	Caterpillar
Reverse/reduction gears	Twin Disc
Generators	Caterpillar
Steering system	Al George
Engine controls	Kobelt
Air compressors	Quincy
Bow thruster	Arcturus
Shafts	Aquamet
Propellers	Federal
Strainers	Groco
Bilge pump	Jabsco
Fire pump	Crown
Freshwater pumps	Deming
Sanitation pumps	Barnes
Air conditioning/heating	Lemoine's
Radar	Furuno
VHF	International
Compass	Ritchie
Fathometer	Datamarine
Navigation lights	Aqua Signal
Engine room lighting	Pauluhn
Horn	Kahlenberg
Blowers	Hartzell
Potable water filter system	Pure-Pro
Water closets	Kohler
Sanitation flushing	Burks
Macerator	Hydromatic
Windows	B.J. Aluminum Co.
Lifefloats	Jim Buoy
Lif jackets	Sterns
Bell	Perko
Pilot chair	Eacco Marine
Batteries	Gould
Battery chargers	Sentry



Looking more like a stylish megayacht than a commercial charter boat, the Caterpillar-powered Anita Dee II will be available for group charters, private parties, wedding receptions, corporate functions, and other events.

eight months construction time, Aluminum Boats was able to speed up construction by having the boat's hull and superstructure fabricated at Equitable Shipyards in New Orleans, a sister shipyard to Aluminum Boats, in the Trinity Marine Group.

The Anita Dee II will be 140 feet in length, with a 33-foot beam, and a 9.5-foot depth amidship. She is

powered by two Caterpillar 3408TA diesel engines driving through Twin Disc reverse reduction gears, and can achieve a cruising speed of 12 knots.

For free literature on the facilities and capabilities of Aluminum Boats, Inc.

Circle 32 on Reader Service Card

### 40-Page Catalog Offered On Full Line Of Joystick Controllers From Merritt

J.R. Merritt Controls, Inc. of Stamford, Conn., has introduced made-to-order 1-, 2- and 3-axis joysticks for industrial and military applications to control mobile work platforms, cranes, material handlers and robotic manipulators.

These Type CS2 joystick controllers are corrosion resistant and environmentally sealed to NEMA 4x.

They are especially suitable for use in high duty cycle applications and where severe temperatures are encountered from -40 to +70 degrees C.

Up to eight contacts or combination of contacts and potentiometers can be supplied along with an extensive variety of options and accessories for providing step, stepless and proportional control.

For further information and a free copy of the new 40-page catalog on J.R. Merritt's full line of products,

Circle 43 on Reader Service Card

**Bender Awarded  
\$3-Million Contract  
For Drill Rig Repair**

Bender Shipbuilding & Repair Co., Inc. was recently awarded a \$3-million contract for overhaul, repair and conversion work. The work will be performed on the NN-1, an offshore jack-up drilling rig which is 50

percent owned and operated by Noble Drilling Corporation, of Houston, Texas in partnership with National Enerdrill Corporation.

The project consists of drydocking the rig, reactivating all components and installing additional quarters. The project is expected to be completed by the end of this month. Upon completion, NN-1 will be dry-towed to Nigeria, where it

will be employed by Shell Petroleum Development Company of Nigeria Ltd.

Bender is a full-service shipyard that builds, converts and repairs vessels for commercial and governmental owners and operators.

For more information on Bender's services and facilities,

Circle 7 on Reader Service Card

**Hardwick Promoted  
At Tano Marine Systems**



Guy Hardwick

Guy Hardwick has been named vice president of marketing and quality assurance for Tano Marine Systems, Inc.

Mr. Hardwick, a 20-year veteran of the company, will head the marketing, product development, applications engineering and quality assurance organizations at Tano's headquarters in New Orleans. Tano designs and manufactures computer-based automation and control systems for military and commercial ships.

**Kvaerner Group Buys,  
Leases Back New  
Del Monte Reefers**

In one of the largest transactions of its kind, Polly Peck International has sold its nine new Del Monte refrigerated ships for a total of \$237.8 million.

The fleet was purchased by Norway's Kvaerner Group, along with other Norwegian interests, from PPI Del Monte Fresh Produce. The ships, which will be operated by Kvaerner's reefer management company Irgens Larsen, are to be leased back to Del Monte under a ten-year contract that includes a renewal option for another five years.

Four of the reefers still have yet to be delivered from Astilleros Espanoles's facility in Seville. One is undergoing completion, and the other three are scheduled for delivery during the first quarter of next year.

**Levin To Manage  
Seaworthy Systems  
West Coast Office**

Seaworthy Systems, Inc., has announced the appointment of Kenneth Levin to the position of West Coast office manager.

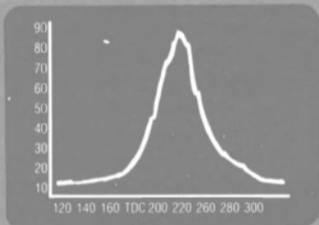
Mr. Levin brings nearly 25 years of marine engineering, operations and management experience to Seaworthy. For the last 15 years, he has been involved in marine project engineering, program management and corporate management, conducting engineering and economic analyses, surveys and troubleshooting.

Seaworthy is a full-service firm offering capabilities, both technical and managerial, in the disciplines of marine engineering, naval architecture, industrial power, financial analysis and computer services.

1-9-7-8



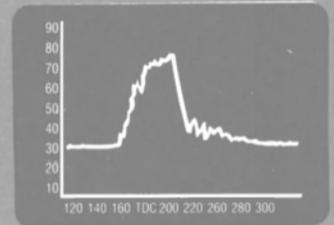
D-6 Class  
4 Vessels NK-3  
Combustion Curve



1-9-8-2



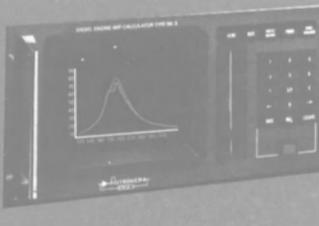
D-9J Class  
12 Vessels NK-4  
Combustion & Fuel Injection



1-9-8-7



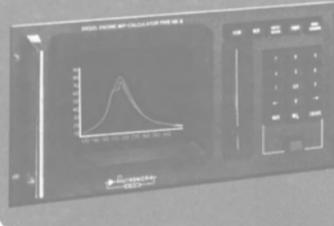
D-7 Class  
3 Vessels NK-5  
Combustion & Fuel Injection



1-9-9-0



Atlantic Class  
12 Vessels NK-5  
Combustion & Fuel Injection



**Sea-Land  
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Buys  
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- Diesel Performance Monitoring System
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Circle 237 on Reader Service Card

## BOATS & BARGES

### Cummins Diesels Power Cruise Vessel 'America' Delivered By Marine Builders



The Cummins-powered America will operate along the Missouri River in the Kansas City area on a regular schedule from March through October.

River City U.S.A., Inc., the Kansas City, Kan., operators of the Cummins NTA-855-M-powered paddle-wheeler Missouri River Queen, recently took delivery of a second passenger vessel, the new 150-foot, 800-passenger America.

Built by Marine Builders, Inc. of Utica, Ind. (also the builder of the Missouri River Queen), the America is powered by two Cummins NTA-855-M marine diesels rated 350 hp each at 1,800 rpm. The engines turn 48-inch by 32-inch four-blade Bird-Johnson propellers on 4-inch shafts through Tonanco model KC-TM-828 marine gears. Electrical power is

AMERICA List of Suppliers	
Main engines	Cummins
Engine controls	Wabco
Steering system	Marine Builders
Reduction gears	Tonanco
Propellers	Bird-Johnson
Generators	Marathon/Cummins
Alarm	Murphy
Horn	Kahlenburg
Keel coolers	Johnson

produced from two 135-kw Marathon generators turned by Cummins 6CT8.3-G generator drive engines.

Marine Builders are well known for their design and construction of

towboats, barges, and drydocks. They also built the Star of Louisville in 1988, a 126-foot, 600-passenger dinner cruise vessel that is a very popular attraction in the Louisville area.

The America is a Marine Builders design working in conjunction with the marine architectural firm of Coe M. Best Jr. & Associates. The design features a food preparation and cleanup facility in the steel hull, insulated and tinted glass cabin windows, three complete bars, a gift shop, and a canopied third deck. Normal engine sound is minimized

due to the use of a Lo-Rez Vibration Isolation System, which adds to the passenger's comfort and enjoyment. The America seats approximately 450 passengers for dinner cruises and is certified to carry up to 800 passengers overall.

For further information on Cummins engines,

**Circle 23 on Reader Service Card**  
For free literature on the facilities and capabilities of Marine Builders,

**Circle 24 on Reader Service Card**

## PROPULSION UPDATE

### ZF Introduces New Series Of Economical High-Horsepower Marine Transmissions

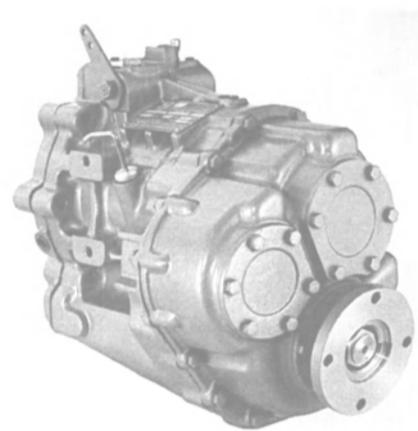
Two new series of economical, high-horsepower-capacity, light-alloy marine transmissions have been

introduced by ZF of North America.

The IRM 41 series and IRM 50

series marine transmissions are rated for light- and medium-duty and pleasure craft duty cycles for diesel engines, and light-duty and pleasure craft duty cycles for gasoline engines through 524 hp.

These efficient, hydraulically clutchable gearboxes remain inexpensive because it is not normally necessary to reverse a small vessel under full power. For nine-degree down angle configuration, ZF offers A<sub>2</sub> and A<sub>3</sub> versions. The A013 transmits full forward power with identical input and output rotation. Outboard turning counter-rotation may



The IRM 50 A<sub>2</sub> marine transmission from ZF of North America.

be accomplished by mounting an A<sub>2</sub> to starboard and an A<sub>3</sub> to port in an application with dual standard rotation engines.

The IRM 41I and IRM 50I are coaxial gearboxes, having the input and output on the same center line. This design allows the engine to be mounted lower in the hull. The down angle configurations of the IRM 41A and IRM 50A provide a nine-degree output shaft, to allow more flexibility in a direct-output engine installation.

The compact design of these transmissions results in a shorter engine/transmission package, requiring less space in the hull.

ZF, headquartered in Friedrichshafen, West Germany, is a leading manufacturer of major power train components—gears, transmissions, pumps, axles and other drive systems. Markets served include automotive, on- and off-road heavy duty vehicles, marine and special equipment industries. ZF-AG, a Fortune International 500 company, is celebrating its 75th anniversary in 1990.

ZF of North America is headquartered in Lincolnshire, Ill.

For more information and free literature from ZF,

**Circle 33 on Reader Service Card**

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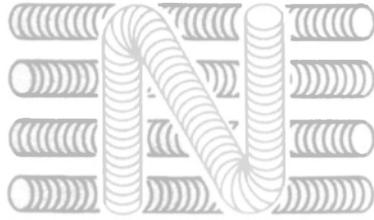
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*America's Composite Hose Company*

### **An Open Letter From The President:**

The composite hose manufactured at NuFlex is superior in every facet to those manufactured by any of our competition.

One reason for this is the materials that go into our hose are the finest - (all made in America). We buy our materials from companies such as Exxon Corp., Johnson & Johnson, I.C.I. Americas. All proven companies with a proven record of excellence.

By manufacturing the product in the USA we are able to service our customers not only much easier and faster but at a more competitive price as well. Special services such as color coding—customer labeling—different wire or other compound combinations can be manufactured and shipped usually within a seven day period. (This lead time is unthinkable when dealing with our European competitors.)

Because of all the problems America has encountered through the years, everyone is conscious of the strong message being sent out to "Buy American" we believe that this gives our distributors a decided edge over their competition when competing in today's marketplace.

While examining our catalog you will become aware of the wide variety of hoses that NuFlex offers, we feel this also gives our distributors a decided edge.

### **In The Final Analysis We Offer:**

1. Finest quality (American made materials)
2. Superior Service
3. Proven Saleability
4. Wider Range of Products

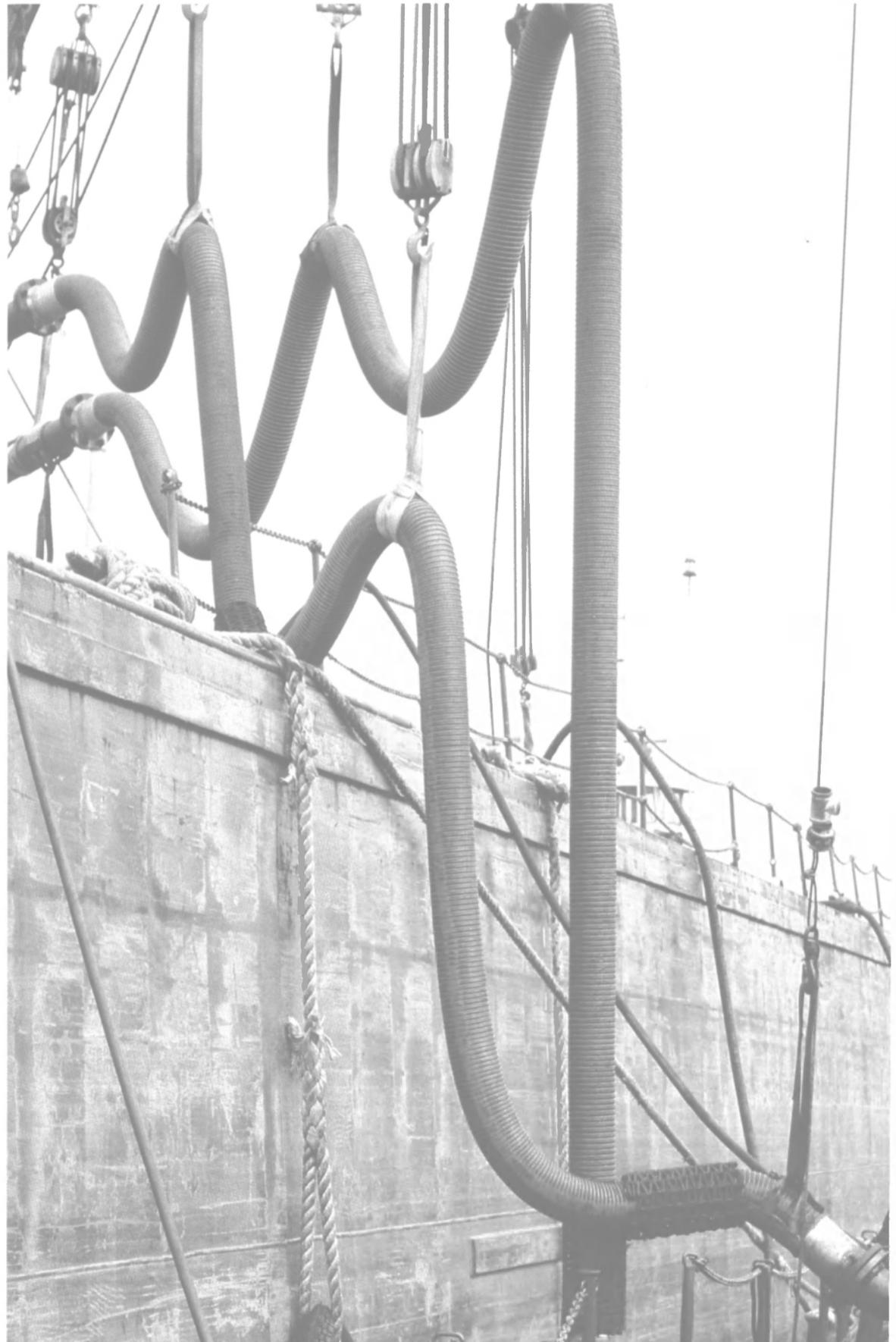
There is one point that we haven't covered here and that is DEDICATION. Everyone at NuFlex is totally dedicated to supplying our customers with a product that is suited to their needs at a price that they "can live with". When talking with our inside people, sales engineers or technical people this dedication will become very apparent. All we ask in return is the opportunity to serve you.

Very truly yours,

**Harry Combe**  
President

Circle 307 on Reader Service Card

**800-242-2533**



## BOATS & BARGES

### \$13-Million, Five-Boat Contract Completed By Moss Point Marine With Delivery Of Tugs To Jordan

The Trinity Marine Group has completed a five-boat, \$13-million contract with the delivery of two 106-foot docking tugs from Moss

Other shipbuilding companies in the group are Halter Marine, Inc., Gretna Machine and Iron Works, Inc., Aluminum Boats, Inc., HBC,



The General Motors EMD-powered tugs Amman (shown above) and Aqaba will work in the Gulf of Aqaba helping to maneuver ships to anchorage and to and from piers.

Point Marine, Inc., Escatawpa, Miss., to the Jordan Ports Corporation of the Hashemite Kingdom of Jordan.

The new tugs, Amman and Aqaba, are each 106.5 feet in length, with a 34-foot molded breadth, and 16-foot molded depth.

Each is powered by two General Motors EMD-8-645F7BA engines developing a total of 3,200 bhp driving through Reintjes VAL1850 reduction gears with a ratio of 4.454:1.

Auxiliary and ship's service power is provided by two Caterpillar 3406DITA 200-kw generators. The boats are also equipped with controllable pitch propellers inside steerable Kort nozzles.

Each tug is also equipped with four water/foam fire monitors with a capacity of 1,600 gpm, and each boat has accommodations for a crew of eight.

The tugs made the 8,000-mile trip from New Orleans to Aqaba on their own bottoms with crews provided by Morrill and Associates, New Orleans. The boats' permanent crews are now being trained in vessel operations and maintenance by training teams supplied by Moss Point Marine, Inc.

The other vessels in the U.S. AID (Aid for International Development) contract were two 60-foot steel towboats built by Moss Point Marine, Inc., and one 50-foot steel and aluminum pilot boat built by Equitable Shipyards, Inc., New Orleans, a sister shipyard to Moss Point Marine in the Trinity Marine Group.

## BOATS & BARGES



The Deutz MWM-powered Pemex L1 is the first of four harbor tugs being built for Mexico by Astilleros Unidos de Mazatlan.

### Deutz MWM Diesels To Power Four Harbor Tugs For Mexico

Astilleros Unidos de Mazatlan, S.A. de C.V. (AUMAZ) in Mazatlan, Mexico, recently delivered the tug Pemex L1 (51) to the Mexican oil company Pemex. The vessel is the first of four harbor tugs powered with propulsion and gensets supplied by Deutz MWM.

Main propulsion for the tug is provided by twin V8 diesels in the 628 series, each with 1,180 hp (1,600 kw) at 1,000 rpm. Both generating sets are driven by Deutz MWM 226 series diesels.

The Pemex L1, based on a design by Muetzfeldtwerft in Cuxhaven, will be used in the port of Topolo-

bampo. The entire imported propulsion package, including engines, twin Schottel rudder-props, and related equipment, was supplied from Germany.

The remaining three tugs from this new generation will be delivered by 1991. This will bring to 11 the number of similarly designed tugs operating in Mexico's harbors with Deutz MWM propulsion and generating diesel engines.

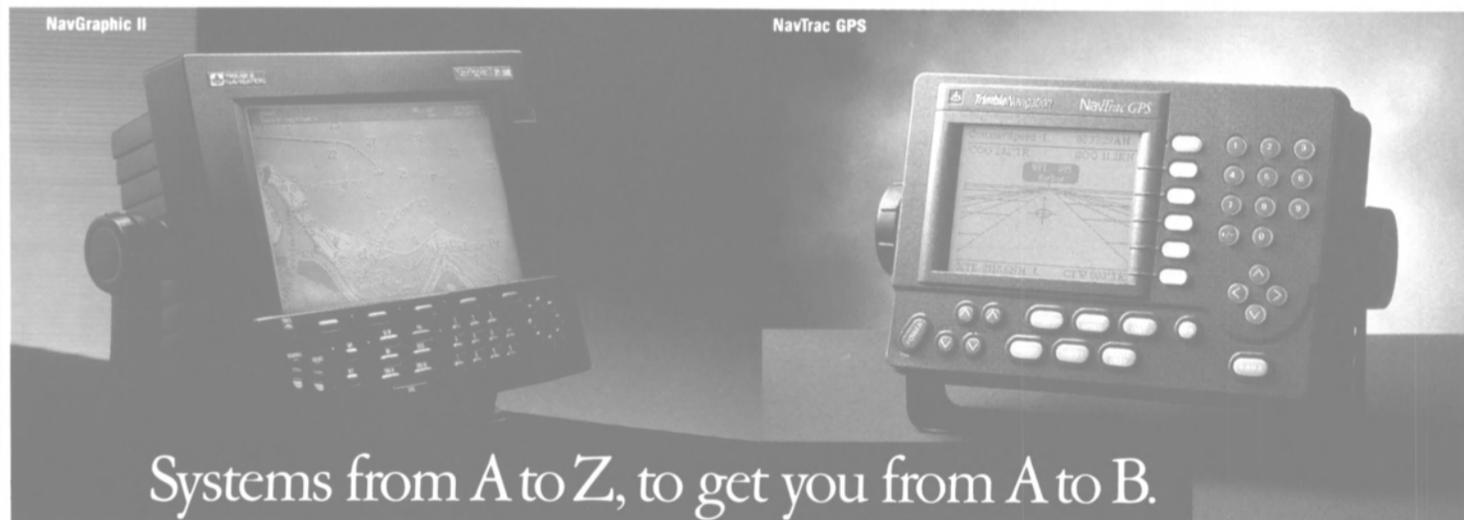
For free literature giving full information on engines from Deutz MWM,

Circle 34 on Reader Service Card

Inc., and Trinity-Beaumont.

For free literature detailing the facilities and capabilities of Trinity Marine Group,

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## BOATS & BARGES

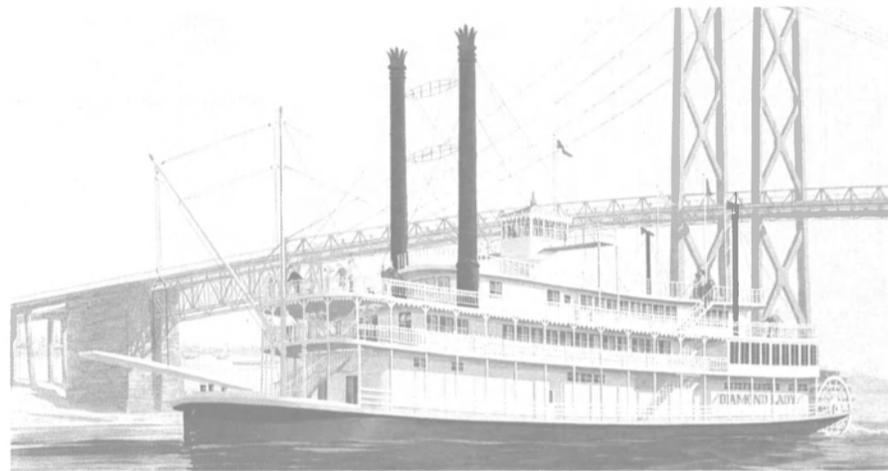
### Atlantic Marine Awarded \$12.6-Million Contract To Build Three Sternwheel Dinner Vessels

Atlantic Marine, Inc. of Jacksonville, Fla., has signed a \$12.6-million contract with Steamboat Development Corporation of Davenport, Iowa, to build three 102-foot sternwheel casino dinner vessels. Delivery will begin in the first quarter of 1991.

Designed by John W. Gilbert & Associates, Inc. of Boston, Mass., the vessels will each have three Caterpillar 3412 marine engines rated 671 bhp at 1,800 rpm for propulsion power. Two engines will drive shafts

and propellers through a reverse reduction gear with clutch. The centerline engine will drive three hydraulic pumps. Two pumps will power the paddlewheel hydraulic motors. The third pump will provide power to the bow thruster hydraulic motor. The vessels will also have two Caterpillar 3412 500-kw generator sets to provide shipboard electrical service.

The 1,200-passenger casino dinner vessels will be berthed in Iowa and will cruise the Mississippi River



The Caterpillar-powered Casino dinner vessels being built by Atlantic Marine will be berthed in Iowa and will cruise the Mississippi River for dining and gambling excursions.

for dining and gambling excursions.

Atlantic Marine, Inc. is located at the intersection of the St. Johns River and the Intracoastal Waterways. Established in 1964, Atlantic constructs all types of vessels including ferryboats, research vessels,

tugs, barges and fishing vessels for the American and international market.

For free literature detailing the facilities and capabilities of Atlantic Marine,

Circle 41 on Reader Service Card

### ABB Marine To Supply \$50-Million Power Package To Fincantieri

ABB Marine has signed a \$50-million contract with the Merchant Shipbuilding Division of Fincantieri in Trieste, Italy, concerning the delivery of the electrical propulsion and power systems for three 50,000-grt cruise vessels under construction for Holland America Line (HAL). Each vessel will carry 1,250 passengers, and will enter upper-market services in the Caribbean between 1992 and 1994.

Responsibility for providing the various components of the \$50-million propulsion package will be di-

vided between two of ABB's operations centers in Europe.

ABB Marine in Helsinki (ABB Stromberg Drives), which is responsible for the technical coordination, will provide two main generators, 7,650 kw each; three main generators of 6,150 kw each; two cycloconverter sets of 12 mw each with feeding transformers; and two main propulsion motors of 12 mw each.

ABB Marine in Italy, (ABB Industria), the legal consortium leader, will be supplying four air conditioning compressor motors of 1,000 kw each; two motor/generator sets, each 6.6 kv/450V, 937.5 kw; three thruster motors of 1,720 kw each; one main switchboard rated at 6.6 kv; an emergency generator with 750 kw output; plus a total of five distri-

bution transformers. Three of these are rated at 6.6kv/450, 2,625 kw. The other two are rated at 6.6 kv/450V/220V.

Over the past decade, cycloconverters driving synchronous motors have shown outstanding reliability on several icebreakers. In addition, orders have been received for similar propulsion systems for one Japanese (Crystal Harmony) and two U.S. cruise vessels (Fantasy and Ecstasy). The M/S Fantasy was recently delivered to Miami for Carnival Cruise Lines; the Ecstasy is scheduled to be delivered next April.

For more information about ABB's available services,

Circle 111 on Reader Service Card

### SeaLink Places \$32-Million RO/RO Order With Yugoslav Yard

Sweden-based company SeaLink, in continuing its recent commitment to newbuilding in Yugoslavia, has placed an order for two 5,800-dwt vessels from Titovo Brodogradiliste.

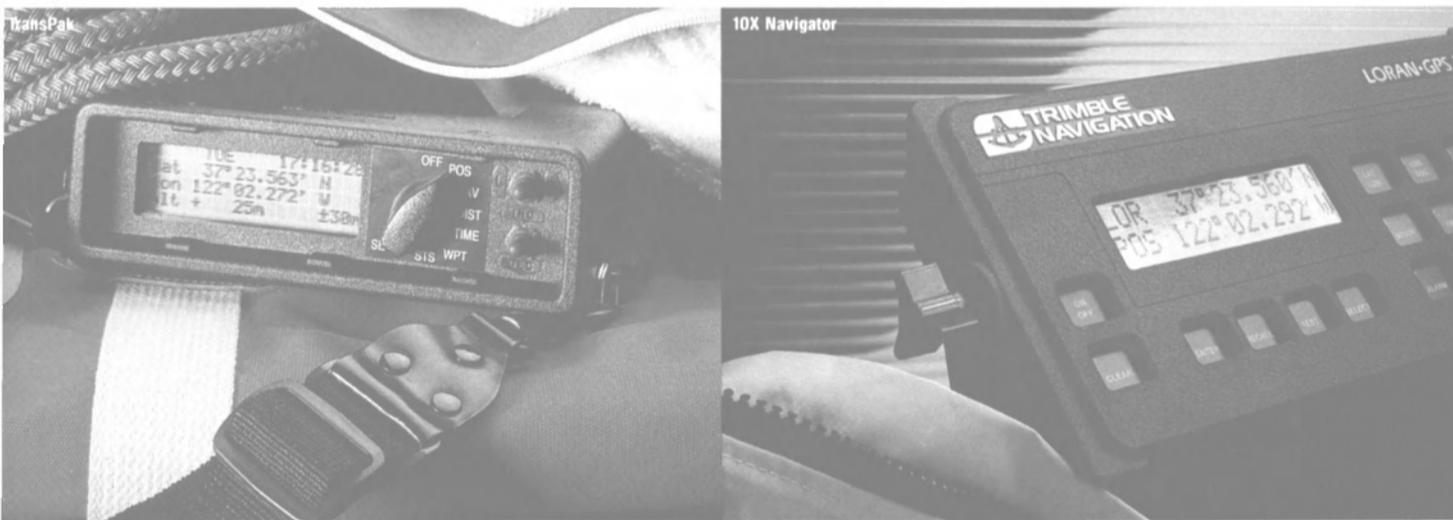
The vessels, which will have a length of 407 feet, a beam of 66 feet and a draft of 20 feet, will be RO/RO forestry products carriers for trade between the Baltic and the UK-European continent area. The ships, which are worth about \$16 million each, will be powered by 4,500-kw Wartsila Vasa engines. Titovo Brodogradiliste's contract with SeaLink includes options on two more ships.

### Maintenance And Repair Promotions At Atlantic Container

Officials at Atlantic Container Line have announced the appointments of **Stephen White** as general manager, corporate maintenance and repair and European logistics; and **James W. Perouty** as corporate manager, maintenance and repair. Both Mr. White and Mr. Perouty will be based at ACL's headquarters in South Plainfield, New Jersey.

In his new position, Mr. White will be responsible for European/Scandinavian logistics and corporate maintenance and repair. Prior to his promotion, he held the title of U.S. Profit Center Manager. He has been working for ACL since 1980 in traffic and logistics in Southampton, England.

**Jim Perouty** will be responsible for maintenance and repair cost controls, equipment standards and maintenance and repair contract negotiations for North America, Europe and Scandinavia. Mr. Perouty brings to his new position six years of experience in the maintenance and repair field with ACL.



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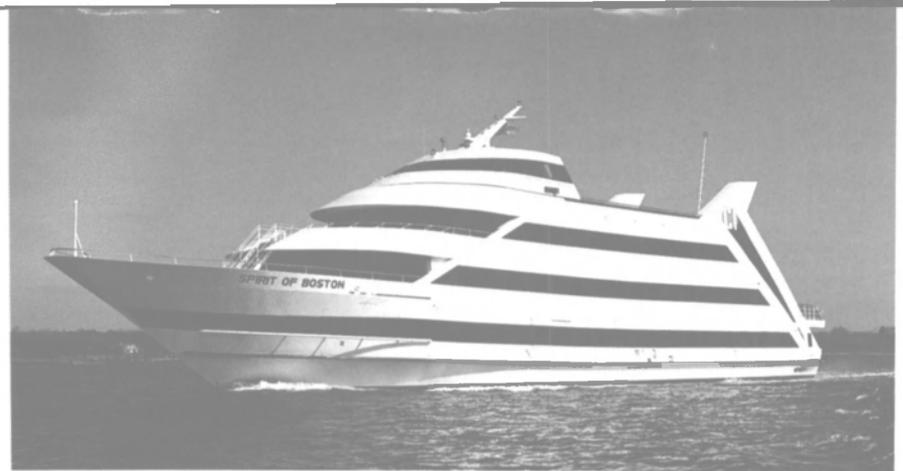
## BOATS & BARGES

### Blount Marine Delivers 192-Foot Dinner/Excursion Boat M/V Spirit Of Boston

Blount Marine Corporation, Warren, R.I., recently announced the delivery of the M/V Spirit of Boston to Holiday Cruise II, Inc., a subsidiary of Cruise International head-

quartered in Norfolk, Va.

The 192-foot-long by 35-foot-wide dinner/excursion boat carries a crew of 75 who are responsible for vessel operations, gourmet food ser-



The Caterpillar-powered Spirit of Boston is the largest and most elegant of more than 25 dinner/excursion vessels designed and constructed at Blount Marine Corporation.

#### SPIRIT OF BOSTON Equipment List

Main Engines	Caterpillar	Sanitary water	
Reduction gears	Twin Disc	pressure set	Lowara Pump
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Engine Controls	Mathers MMC	Fire pump	Gorman-Rupp
Auxiliary engines	Caterpillar	Radar	Furuno
Bow thruster engine	Caterpillar	Depth sounder	Datamarine
Keel coolers	Fernstrum	Compass	Dirigo
Steering system	Wagner	Air horn	Kahlenberg
Freshwater		Search light	ITT Jabsco
pressure set	Aurora Pump	HVAC	Dunham-Bush

vice, and entertainment. The vessel will operate in Boston Harbor and is certified for 600 passengers on three fully enclosed, carpeted, climate-controlled decks. The ship provides a luxurious change of pace for dining, weddings, company functions, and special events.

The Spirit of Boston will join six other ships built by Blount for Cruise International. They are based in New York, Chicago, Los Angeles, Philadelphia, Washington and New Jersey.

**Luther H. Blount**, president and founder, has specialized in

building dinner boats. While visiting France in the late 1960s, he studied the operation of the Bateaux Mouches, one of the first dinner boat enterprises, which began in Paris in the early 70s. The Bateaux Mouches served as a model for Blount's first dinner boats, the Le-bateaux fleet which operated out of Washington, D.C., and Ft. Lauderdale, Fla.

For free literature detailing the facilities and capabilities of Blount Marine,

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## HIGH PRESSURE TO GO!

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114 x 39. "Vistarama" by Blount Marine Corp., Warren RI (401) 245-8300

**"I set out to build a better boat. It had to have the best engines."**

Luther Blount chose Lugger 400 hp 6125A diesels and two Northern Lights 125 kW/1200 rpm gensets for his new Vistarama dinner-excursion vessel.

Based on its 10+ knot performance, quiet operation and stingy fuel use, he ordered Lugger-Northern Lights power for his new 173 foot mini-cruise vessel. Here's what he says.

#### Blount on the Lugger 6125:

"In a cruise boat, people are paying for comfort. You need quiet engines. That's why we used 1200 rpm Northern Lights gensets too."

"Luggers are slim; easier to

install than most V-engines. There's less clutter and more room around the engine. I like the Bosch-type injection Lugger uses. You don't have to tear the engine apart to work on it. And they use a lot less fuel than some of the engines we have used. Plus Luggers are lighter in weight, and that's important for shallow draft."

"They're working out so well that we're putting two Luggers and three Northern Lights in our new shallow draft 173 footer. That's how much I think of these engines."

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Circle 212 on Reader Service Card

Maritime Reporter/Engineering News

## Canadian Government Report And New U.S. NOAA Administrator Publish Strong Swath Endorsements

The Canadian Department of Fisheries and Oceans, following extensive trials of the Swath Ocean® vessel Frederick G. Creed in the North Atlantic this past winter, has released a report which strongly endorses employing the swath vessel in hydrographic survey, economic zone patrol and oceanography roles.

In a paper recently presented to Hydro USA 90—an international body of hydrographers at Norfolk, Va., sponsored by the U.S. National Oceanic and Atmospheric Administration (NOAA) and The Hydrographic Society of America—the Canadian authorities concluded that the 80-ton aluminum vessel, of the small waterplane area twin hull type, “permit the collection of bathymetric data at an unprecedented rate even in poor sea conditions.” In assessing overall performance, the Canadians found that in contrast to all vessels they had previously em-

ployed, the Swath Ocean 2000 Class vessel was “smaller in displacement, faster, operated by a smaller crew and operated more efficiently in deteriorating sea conditions, resulting in a much larger operational weather envelope.”

The Frederick G. Creed was designed and built by Swath Ocean Systems, Inc., of Chula Vista, Calif., launched October 1989, and is the fourth in its series of swath vessels. She is approximately 67 feet in overall length, 32 feet in beam, draws 9.5 feet and has a top speed of 25 knots with a cruising speed of 21 knots. From December 1989 to the present, she has been operated under charter and evaluated in a joint U.S./Canada Hydrographic Commission project. Canada is now in the process of buying the vessel.

In the keynote address to the symposium—with an audience which included the top-ranking hydrographers of the Canadian, Fiji



The Frederick G. Creed, designed and built by Swath Ocean Systems of Chula Vista, Calif., is the fourth in its series of swath vessels.

and Norwegian Governments and of the American, Argentinian, Dutch, Indian, Italian and Peruvian navies—newly appointed U.S. Under Secretary of Commerce (for Oceans and Atmosphere) **John A. Knauss** made an unusually strong prediction about how swath vessels like the Creed would support advanced mapping technologies such as global position systems (GPS) and multi-beam systems: “Most expect that modern sonar technology coupled with the accuracy of GPS, all used aboard small, but highly stable swath vessels, the results fed directly into computer derived ‘boat sheets’, will soon produce a revolution in charting efficiency and effectiveness even more spectacular than

those generated by . . . systems introduced after World War II.”

Swath Ocean have production affiliates in the U.S., Canada and in Europe and currently market the 2000 Class vessel for use in hydrographic survey, patrol, light oceanography, marine pilot and small passenger carriage roles. Swath Ocean also have a high-speed all-passenger ferry with 30-knot/450-passenger capacities and a steel-hulled RO/RO ferry able to carry 500 passengers and 125 cars at a loaded service speed of 36 knots.

For free literature containing further information on Swath Ocean International,

Circle 40 on Reader Service Card

## USCG Awards \$6.5-Million Contract To Marinette

Marinette Marine Corporation, Marinette, Wis., has been awarded a \$6.5-million contract by the U.S. Coast Guard to build one Aids To Navigation (ATON) barge. The contract includes an option to build a second barge, pending funding authorization.

The barge will be 120 feet long and 50 feet wide, with a crane and winches for buoy handling. ATON barges are intended to be used in conjunction with existing USCG tugs to deploy, maintain and recover buoys on the Great Lakes system.

Marinette's current schedule calls for the first barge to be delivered in the spring of 1991.

For free literature describing Marinette Marine's complete facilities and services,

Circle 2 on Reader Service Card

## Marine Travelift Names Krueger VP Of Finance

Marine Travelift, Inc. recently promoted **Steven Krueger** to vice president of finance.

Prior to his promotion, Mr. **Krueger** served as the firm's comptroller. In his new position, Mr. **Krueger** is responsible for all corporate accounting activity, financial reports and analysis, banking and credit management, tax planning, and data processing.

Mr. **Krueger** will be acting in this capacity for Marine Travelift, Inc. and its subsidiaries, Shuttlelift, Inc. of Sturgeon Bay, and Kewaunee Engineering Corp. of Kewaunee, Wis. Marine Travelift, Inc. manufactures marine hoisting products; Shuttlelift manufactures industrial

hoisting products; and Kewaunee Engineering is a metal fabricator.

For more information regarding Marine Travelift products,

Circle 116 on Reader Service Card

## IMO-Delaval Offers New Rotating Machinery Upgrading Service

IMO Industries Inc., Delaval Tur-

bine Division, of Trenton, N.J., is offering free literature on upgrading or revamping Delaval turbine rotating machinery.

IMO Industries designed the machinery and has intimate knowledge about every Delaval turbine, compressor, boiler feed pump and all other Delaval rotating machinery installed.

Delaval can make the changes required to meet your new operating parameters by using the latest tech-

nology, such as the application of magnetic bearings and dry gas seals. They can revamp your equipment to improve performance and reliability as well as reduce maintenance costs.

Delaval's revamps are backed with a one-year warranty.

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Designed and built using the highest quality materials of construction, far superior to conventional packing, Series 100 and Series 200 mechanical seals work tirelessly to maintain the integrity of

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For smoother sailing, greater safety and worry-free operation, make the switch from conventional packing to high performance Coffin® mechanical seals. Call today for details.

#### Precision Engineered Coffin® Seals —

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Circle 32 on Reader Service Card

## BOATS & BARGES

### Master Marine Completes Repair, Maintenance On USCG Island Class Patrol Boats

Over the past year, Master Marine, Inc., Bayou La Batre, Ala., has been awarded three separate contracts for repairs and maintenance to eight 110-foot Island Class patrol boats.

The repairs have consisted of general maintenance such as sandblasting and painting of underwater tanks, sewage tanks, forepeak and chain locker. The underwater hulls' ablative system was renewed, as well as non-skidding the decks. A major job on the USCGC Farallon, the first 110-foot cutter of this class

built, was changing the hydraulic steering piping system from steel to stainless steel throughout the whole vessel. Extensive mast maintenance, renewal of some shell plating, extensive inspections of rudders, shafting and bearing tolerances were just some of the other work completed while the vessels were in drydock at Master Marine.

In order to perform these repairs efficiently, Master Marine has developed a repair management team that is capable of coordinating as many as 60 to 70 different jobs each



Coast Guard patrol boats (from left) Manitou and Farallon, recently docked for maintenance at Master Marine.

on a multi-vessel contract. Some of these jobs are of a highly technical nature, such as inspection and repairs to fin stabilizers and electronic cathodic protection systems. Through the use of their job planning and management software, the repair management team is able to plan, track and project the progress of each job accurately.

Because of these developments, Master Marine can now apply the

same techniques to repairs and conversions for the private sector, thereby cutting down repair costs and shortening repair periods due to more efficient organization and planning.

For further details on the full line of services available from Master Marine,

Circle 8 on Reader Service Card

## BOATS & BARGES

### Trinity Marine To Build Three 220-Foot Supply Boats Under \$15-Million Contract

An important turning point in the resurgent offshore oil and gas industry took place recently when the Trinity Marine Group, Gulfport, Miss, announced receipt of a contract from Oil & Gas Rental Services Inc., Morgan City, La., to build three 220-foot, all-steel offshore

supply boats.

The announcement was made by **John Dane III**, president of the Trinity Marine Group, **B.A. Adams Sr.**, president and CEO, **Luke L. Guarisco**, chairman of the board, and **Peter V. Guarisco**, director, all of Oil & Gas Rental Ser-

vices, at Halter Marine, Inc., in Lockport, La.

Mr. Dane said that the contract is significant "because these new supply boats will be the first of their type designed and built from the keel up, since the downturn in the offshore industries in the early 80s. To my knowledge, there has not been an all-new supply boat built in the U.S. since Moss Point Marine, Inc., one of our companies, built seven of them between 1983 and 1985."

The new boats, priced in excess of \$5 million each, will extend the current construction backlog at Halter-Lockport an additional 14 months and will create a need for about 75 more shipbuilders in all crafts.

According to Mr. Dane, the multiple contract is a harbinger of better things to come since it indicates the oversupply of older support vessels has been reduced significantly, creating a need for new boats, and increased shipbuilding employment.

The owners said these boats represent a new generation of supply boats as each of the identical boats will have increased capacities for liquid and dry drilling muds and other supplies required for offshore exploration and drilling. The design and specifications for the new vessels is a joint effort of Trinity Marine's engineering staff and **William H. (Bill) Hidalgo**, vice president and general manager of Oil & Gas Marine Service.

Each of the new boats will be 220 feet in length, with a 44-foot beam and a 16-foot depth. Each vessel will be powered by two General Motors EMD 16 645-C engines rated at 1,950 hp each at 900 rpm. The boats will each have four liquid mud tanks with a total capacity of 2,200 barrels, and six dry mud tanks totaling 8,000 cubic feet. The 5,400-square-foot aft deck will be able to carry up to 1,000 long tons of cargo.

The new boats will be built to U.S. Coast Guard standards under sub-chapter "I" cargo and miscellaneous vessel for offshore oil and mineral industry, full ocean, under 500 gross tons. They will also be built in accordance with the American Bureau of Shipping, and will be certified AMS Full Ocean. Construction of the first boat will begin immediately and all three vessels are expected to be delivered by June 1991.

In related news, a second U.S. builder, Jennings, Louisiana-based Leevac Shipyards, Inc., also recently announced the receipt of a construction contract for an offshore supply boat for a U.S. Gulf Coast firm.

For complete literature describing the full line of services offered by the Trinity Marine Group,

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## The Seaward dock fender. If the U.S. Navy thinks it's good enough for the 1990's maybe it's good enough for your facility now.

The U.S. Navy chose Seaward dock fenders to protect Pier Zulu, in Charleston, S.C. This new 20 million dollar pier is the prototype of the Navy's pier designs for the 1990's. Seaward's fenders have also been installed on new Navy berthing facilities in California, Florida, Virginia, Iceland, and the Philippines. These fenders are being included in the design of new home port facilities and are being used in the upgrading of Navy docks around the world.

Seaward dock fenders are constructed of a tough, snag-free elastomer coating. And Seaward's closed-cell foam center has a very high energy absorption capacity but a low reaction force. These fenders provide stand-off and safely cushion the impact of approaching vessels, whether they're tugboats or battleships. Yet Seaward dock fenders are as easy to install as they are rugged.

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## BOATS & BARGES

### MTU-Powered High-Speed Catamaran, Built To New Flying Cat Design, Delivered By Kvaerner Fjellstrand

The new Flying Cat high-speed catamaran from Kvaerner Fjellstrand of Norway represents one of the most advanced vessels of its kind in the world. A first unit built to this design, the Kommandoren, was recently delivered to west Norwegian ferry operator Fylkesbaatane, and is now in operation.

Fjellstrand has drawn on experience from building some 30 of its 127-foot catamarans for owners in 18 different countries worldwide in designing and constructing the Flying Cat series.

The Kvaerner Flying Cat features, apart from modernized de-

#### KOMMANDOREN Equipment List

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Navigator	Shipmate
Navigation lights	Tranberg
Radiotelephone	Sailor

sign, important changes both externally and internally. Seakeeping characteristics have been improved



The MTU-powered Kommandoren, built to Kvaerner's Flying Cat design, features a very low noise level, limited motion in seaways, and high speed combined with a new and modern design to ensure maximum comfort for travelers.

by incorporating flares in the tunnel between the twin hulls. This causes waves to break before they hit the tunnel roof, improving overall seakeeping and ensuring a comfortable journey even in high seas.

The 131-foot-long by 33-foot-wide Kommandoren, which can accommodate 252 passengers, is powered by two MTU 16V TB 84 engines with KaMeWa water jets, pro-

viding a service speed of 37 knots. It is classified Det norske Veritas 1A1 Light Craft, and will operate in a regular service between Bergen and the county of Sogn further to the north, while switching to charter traffic during the summer months.

For free literature detailing the facilities and capabilities of Kvaerner Fjellstrand,

Circle 35 on Reader Service Card

### Saez Named Chairman At AESA



Juan Sáez

Officials at Astilleros Espanoles have announced that general manager **Juan Saez** has been named as the new chairman and chief executive officer of the company, which is Spain's foremost shipbuilding group.

**Miguel Aguilo** has stepped down from the position to become the new chairman of Iberia, Spain's national air carrier.

Mr. Saez, in addition to his duties as chairman and CEO, will take on Mr. Aguilo's responsibilities for Astilleros de Noroeste (Astano). He will also succeed Mr. Aguilo as chief executive of the Instituto Nacional de Industria's shipbuilding division.

### COMSAT Expands Its Mobile Communications To New Ocean Region

COMSAT Mobile Communications is upgrading its Southbury, Conn., coast earth station to provide communications access to a second INMARSAT satellite over the Atlantic Ocean that will offer maritime, aeronautical and international land-mobile customers coverage in a fourth ocean region planned for the

fourth quarter of 1990.

**Ron Mario**, vice president and general manager, COMSAT Mobile Communications, explained that the new INMARSAT fourth ocean region will be created by dividing the existing single Atlantic Ocean Region (AOR) into two regions, Atlantic Ocean Region-East and Atlantic Ocean Region-West, while the Pacific and Indian Ocean Regions remain the same.

The short-term reason for the expanded coverage, according to Mr. Mario, is to relieve congestion in the INMARSAT satellite system until its second-generation satellites are launched in late 1990 and 1991.

From a longer-term perspective, this will allow complete global coverage for COMSAT services by closing a small coverage gap which exists in the current INMARSAT three-ocean region satellite configuration.

"The level of communications traffic in the Atlantic Ocean region is double that of the Pacific and Indian Ocean regions. When COMSAT begins operating in both Atlantic Ocean regions, it will effectively add and estimated 50 percent to available capacity, relative to the capacity of the single Marecs satellite," he said. The cost of upgrading the Southbury facility is approxi-

mately \$2 million, according to Mr. Mario.

COMSAT Mobile Communications, based in Washington, D.C., provides maritime, aeronautical, and international land mobile satellite communications to customers around the world through its INMARSAT coast earth stations, located in Southbury, Conn., and Santa Paula, Calif. COMSAT represents the U.S. in the 59-member International Maritime Satellite Organization (INTELSAT).

For further information and free literature,

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## Allied-Signal 'Spectra Shield' Panels For Marine Vessels Offer Maximum Ballistic Protection

Spectra Shield®, a patented ballistic technology from Allied-Signal Inc., is now being specified to be the critical reinforcing material for the hulls of some Coast Guard and other patrol vessels used to prevent the influx of drugs into the U.S. Because criminals today are often equipped with automatic and higher caliber weapons, the vessels that guard our shores require ballistic protection superior to that provided by the basic hull structure.

Spectra Shield incorporates Spectra®, one of the strongest fibers ever made, in a non-woven, thermoplastic resin to offer the greatest ballistic stopping power available.

Spectra was engineered with one of the highest strain wave velocities of any fiber. This translates into Spectra Shield's ability to absorb and disperse the impact energy of a

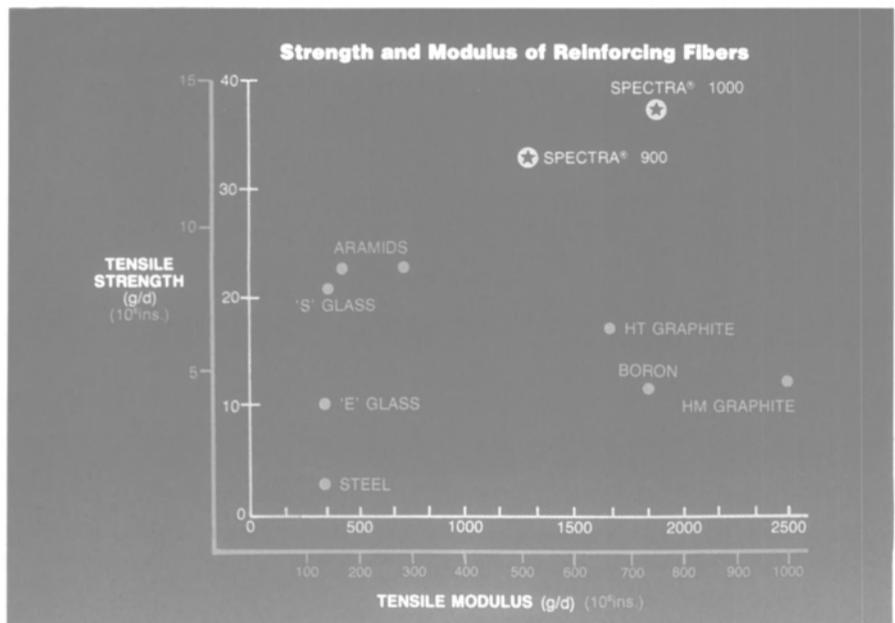


The Boston Whaler uses Spectra for its reinforcing panels to achieve optimum resistance to high caliber ballistic penetration.

projectile over a maximum area. Because it is non-woven, Spectra Shield does not contain interlacing that causes strain waves to reflect and break the fiber.

In addition, Spectra's unique structure has these outstanding properties: high strength-to-weight ratio, high modulus, excellent moisture and chemical resistance, and neutral buoyancy.

Boston Whaler Inc., Rockland, Mass., a manufacturer of state-of-the-art fiberglass and aluminum hulls for a variety of government agencies, has been working closely with Allied-Signal Inc. to develop applications for Spectra Shield as the key reinforcing material in fiberglass hulls. Recently, Boston Whaler introduced its first Spectra Shield-paneled Defiance class vessel to the Maryland Dept. of Natural Resources. With the Spectra Shield panels installed, this vessel exceeds NIJ Level III requirements—offer-



For ballistic protection, Spectra offers one of the most outstanding combinations of high strength and modulus of any reinforcing fiber available today.

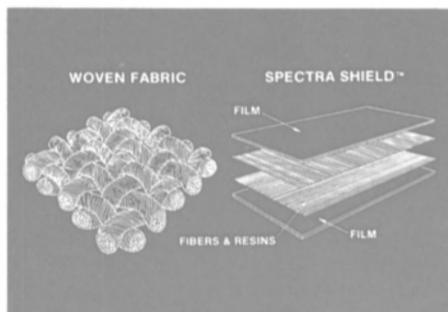
ing the most advanced ballistic protection available today.

Spectra fibers are manufactured by Allied Fibers, a division of Allied-Signal Inc., Morristown, N.J., a \$12-billion manufacturer with 43 businesses in three core sectors—Aerospace, Automotive and Engi-

neered Materials—serving vital industries in major markets worldwide.

For further information on Spectra Shield lightweight panels from Allied-Signal,

Circle 51 on Reader Service Card



Spectra, Allied-Signal's patented non-woven technology, does not contain interlacing which can cause strain wave reflections that damage the fiber.

### Taricco Promoted At COMSAT Maritime Services

It was recently announced by COMSAT Maritime Services that **Thomas F. Taricco** has been appointed to the position of director, maritime sales. He replaced **Edward G. Ryznar**, who was promoted to the position of vice president, maritime sales.

In his new position, Mr. Taricco

will be responsible for the company's maritime sales efforts within the transportation, shipping, fishing and offshore markets.

Mr. Taricco has over 26 years of experience in the telecommunications industry; the last 14 of which were spent in product, service and sales management. He joined with COMSAT in 1988, and served most recently as regional manager, Pacific.

### New Paint Factory For Sigma In Amsterdam

Sigma Coatings BV has announced plans to build a new paint factory and technological center in Amsterdam.

The factory will be situated on a 32.5-acre site in the industrial harbor area on the west side of the city. Sigma has an option to expand onto another 30 acres.

Over 129,000 square feet are designated for the building of the production plant, which will provide a capacity of 50,000 tons of paints. The new factory will facilitate the production of an extensive assortment of high-tech products, including the new generation of waterborne protective coatings.

The new arrangement will also help to smooth the transition of a product as its production goes from laboratory-scale to full plant output levels. Research groups working on industrial lacquers, marine paints, construction paints, building and DIY products, as well as color and pigmentation, will support departments such as an analytical laboratory, physical laboratory and process automation.

For more information on Sigma Marine Coatings,

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Maritime Reporter/Engineering News

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## BOATS & BARGES

### Textron Marine Systems Wins \$6.5-Million Contract To Build Two SES Fireboats

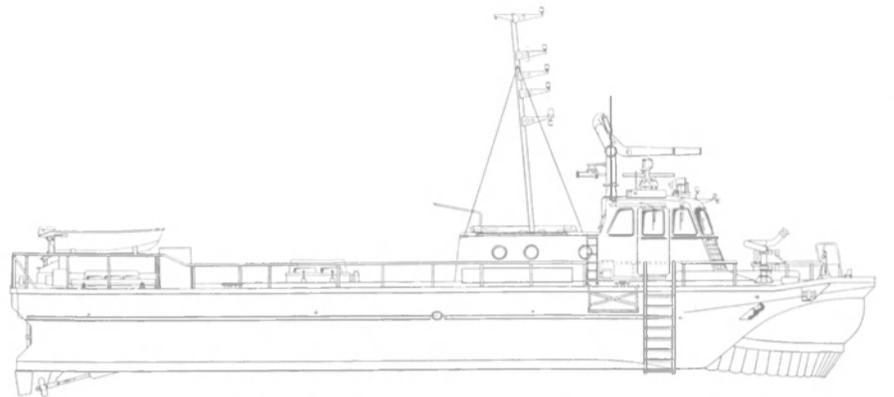
Textron Marine Systems (TMS), a division of Textron Inc., headquartered in New Orleans, La., was recently awarded a \$6.5-million contract for the construction of two Surface Effect Ship (SES), multipurpose fireboats for New York City. The announcement was made by TMS president **John J. Kelly**. Reportedly, they will be the first SES fireboats built in the U.S.

Scheduled for delivery in 1992, the SES fireboats will provide New York City with several capabilities in addition to fire suppression, namely, search and rescue, security and patrol of the harbor, and pollu-

tion monitoring.

The 70-foot by 20-foot fireboats will each be powered by two GM 8V 92TI marine diesels, rated at 450 shp at 2,000 rpm. A GM 6V 92TI diesel, rated at 400 shp at 2,300 rpm, will provide power for the lift fan, while a fourth engine, another GM 8V 92 TI, will provide power for the fire pump. The pumping capacity of each boat will be 7,075 gph at 100 psi at the pump.

An SES is a waterborne, air-supported craft with catamaran-style rigid sidehulls. The SES uses a cushion of air trapped between the sidehulls and flexible bow and stern



Drawing showing the design of the SES multipurpose fireboats ordered by New York City from Textron Marine Systems, New Orleans, La.

seals to lift the center portion of the hull clear of the water. Thus, the resulting reduction in drag produces greater efficiency and higher speeds. A portion of the sidehull remains in the water and aids in maneuverability and stability of the ship. The air cushion maintains a smoother and better ride than most typical conventional planing hulls and catamarans.

The N.Y.C. SES fireboats will be

similar in design to craft used by the Port of Tacoma. The Port of Tacoma SES fireboats, the first such vessels used in the U.S., were built by Vosper Hovermarine Limited, Southampton, England, in 1982 and 1983.

For free literature detailing the boatbuilding services of Textron Marine Systems,

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### Spider Introduces New Man-Rated Traction Hoist —Literature Available

Spider Staging Corporation has introduced the Spider Climber, a man-rated traction hoist backed by a 43-year history of experience in the sale, rental and service of hoisting equipment used in industrial construction and exterior maintenance. The "SC-40" Spider Climber features an average travel speed of 35 feet per minute, controlled descent capability, an overspeed brake sensor, 1,000 pounds of lifting capacity and an hour meter for monitoring usage and scheduling maintenance. Its unique modular assembly provides ease in operation, inspection and maintenance. This unit is detailed in a full-color bulletin now available from Spider Staging.

For more information and a copy of Spider Staging's bulletin describing the Spider Climber,

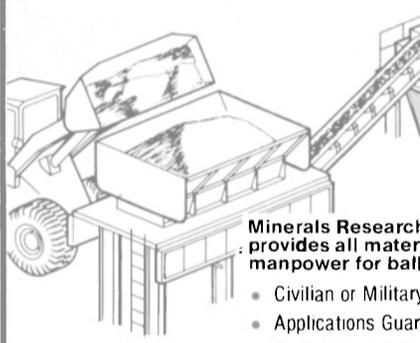
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### Circle Seal Offers Brochure Detailing Solenoid Valves

Circle Seal Controls is now offering a free eight-page brochure which provides technical data and specifications on Circle Seal's line of two- and three-way, two-position solenoid valves. The guide is well illustrated with photos and cutaway drawings, and explanations of how Circle Seal valves provide a bubble-tight shutoff under pressure conditions ranging from vacuum to 6,000 psi. All of the valves described are available for either AC or DC use.

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# Congressional Conferees Near Compromise On Double-Hull Tanker Phase-In

## U.S. Yards Could Gain \$6.6 Billion In Retrofit Work

Maritime Reporter Staff

The Congressional legislative battle over double-hull/double-bottom tankers appears to be drawing to a conclusion. According to reports, House and Senate conferees are currently working on compromise legislation as part of the pending oil spill liability and compensation bill which would gradually phase-in double hull tankers starting in 1995.

The compromise is expected to be similar to a program recently outlined by attorney **Charles B. Anderson** of the New York law firm Haight, Gardner, Poor & Havens, at a forum held in New York by the World Trade Institute. According to **Mr. Anderson**, whose firm represents tanker owners and insurers, all tankers in excess of 40 years old would be required to have double bottoms by 1995, while all tankers more than 25 years old would be required to have double hulls by 2005.

The compromise differs from the

current proposal by the House of Representatives, which would make double hulls mandatory on oil tankers calling at U.S. ports by the year 2005. The House proposal would also require all new construction tankers to be built with double hulls, effective on the date that the legislation is enacted. Inland barges would be required to be built with double hulls by 2015, while existing barges would have until that time to be retrofitted.

The Senate version, on the other hand, provides the administration with much more freedom in determining which ships would be required to have double skins and when the legislation would be implemented.

The **Bush** Administration, which, for quite some time, resisted the inclusion of mandatory double-hull tanker legislation as part of the oil spill bill, recently announced its support for a gradual phase-out of single-skin tankers beginning in the

year 2000.

In a letter sent to key House maritime leaders, Secretary of Transportation **Samuel K. Skinner** detailed the administration's plan.

"The administration generally supports requiring double hulls on new construction of oceangoing tank vessels, if consistent with the findings in the National Academy of Sciences report that double hulls are safe and afford a better protection to the environment than other design features. We believe that existing single-skin, oceangoing tank vessels should be phased out after they are 25 years old (beginning in the year 2000)."

According to **Mr. Skinner's** letter, the phase-out would also include single-skin vessels utilized in lightering operations in the U.S. 200-mile exclusive economic zone.

However, the administration did provide an exemption for vessels operating at deepwater ports.

Secretary **Skinner** said in his letter: "On the basis of the Louisiana Offshore Oil Port's (LOOP) distance from land and excellent record, we do not object to an exemption for vessels servicing a deepwater port licensed under the Deepwater Port Act of 1974, until the year 2015, provided that such an exemption would end when and if before that date an international double-hull standard is implemented."

With regard to tank barges servicing the inland waterway system and

tank vessels operating exclusively on the Great Lakes, the administration supports double-hull requirements beginning in 2015. The administration based its decision on the fact that freshwater vessels have generally longer service lives than oceangoing vessels. The administration sees this as an inducement to owners to build only double-hulled inland barges and Great Lakes tank vessels.

If mandatory double-hull legislation is passed by the government, it would be a tremendous boost as well as a challenge to U.S. shipyards.

According to the Washington, D.C.-based American Petroleum Institute, it would cost about \$30 million to retrofit a tanker with a double bottom, while a tank barge retrofit would cost about \$1.1 million. Based on API projections, the 153 U.S.-flag tankers could be retrofitted at a total cost of \$4.6 billion, while the cost of retrofitting the some 1,800 tank barges operating in U.S. waters would be about \$2 billion.

In addition, since the legislation would affect all tankers entering U.S. ports, between 400 to 500 foreign flag ships would also have to be retrofitted. The cost of retrofitting these vessels, according to API, would be about \$10 billion.

The \$16.6 billion cost of retrofitting does not include any new tanker or tank barge construction.

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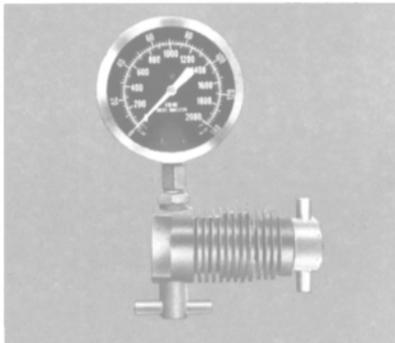
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Maritime Reporter/Engineering News

## Stolt-Nielsen Orders Tank Cleaning Machines From Consilium Systems

Consilium Systems AB, Gothenburg, Sweden, has received an order for 791 newly developed tank cleaning machines from shipping company Stolt-Nielsen.

The new Gunclean equipment will be installed on seven Stolt Pride Class parcel tankers as part of a company ship upgrade program to maximize vessel utilization rates while in port.

According to Consilium Systems, Gunclean uses less water than portable machines, thus minimizing disposal. Additionally, the system's programmed cleaning saves time with nozzles that direct-wash water in prescribed patterns dictated by tank configuration, which enables simultaneous cleaning at the top, middle and bottom levels of the tank.

For free literature detailing the Gunclean tank cleaning systems from Consilium Systems AB,

Circle 80 on Reader Service Card

## Barbee Announces New Air-Driven Hydrostatic Test Pump

Barbee Valve & Supply Co., Inc., a California-based supplier of engineered testing systems, has announced a series of compact, portable hydrostatic test pumps that, the company says, can greatly speed the process of pressure testing.

The portable hydro pumps are air-driven, with pressure capabilities up to 10,000 psi, depending on the model chosen. Either water or hydraulic fluid may be used as a test media for these pumps. The total weight of the portable hydro pump is 40 lbs.

For further technical and applications information on Barbee Valve products,

Circle 59 on Reader Service Card

## Art Anderson Associates To Fund University Of Washington Scholarship

Art Anderson Associates will fund a scholarship for an electrical engineering student next year at the University of Washington. The \$2,000 scholarship will be awarded to a junior majoring in electrical engineering who has expressed interest in studying electric power, and provides full tuition for an in-state student. The student will also be offered a co-op work study opportunity at Art Anderson Associates sometime before he graduates and will be known as the Art Anderson Associates Scholar.

**Eric Anderson**, president of Art Anderson Associates, chose to provide a scholarship in this area of study to encourage growth in enrollment in a vital field which has lost appeal in the electronics age.

Art Anderson Associates is a multi-discipline engineering firm with offices in Bremerton and Seattle.

## New Literature Available On Coffin Mechanical Seals For Turbo Pumps

Coffin® Turbo Pump, Inc. is offering new literature on Series 100 and Series 200 Mechanical Seals for turbo pumps. In this technical bulletin, both systems are described in

depth as to specific applications for each type seal.

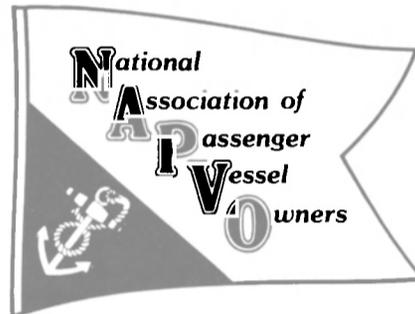
In the literature, both seal types are described as being designed to meet the most stringent requirements of even the newest automated ships in service. According to the manufacturer, both of these mechanical seals have been specially designed for maximum life while eliminating leakage and the use of

asbestos.

These systems-engineered mechanical seals are said to be safe, efficient, lightweight, compact and offering a service life requiring minimal maintenance.

For a free copy of the literature describing the Coffin Turbo Pump Series 100 and Series 200 Mechanical Seals,

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If not, call the leaders in the passenger vessel insurance business. Call Marsh & McLennan.

**For more information contact:** Doug Scholin, Manager  
NAPVO Insurance Center  
(800) 648-7631 or (314) 621-5540  
Fax: (314) 342-0374

# MARSH & MCLENNAN

Circle 222 on Reader Service Card

## BOATS & BARGES

### Marco Shipyard Christens Fourth North Pacific Freezer Longliner

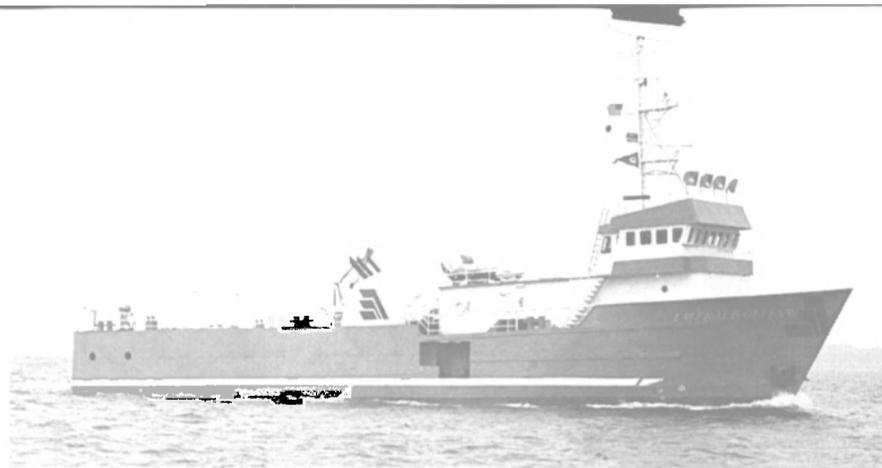
Marco Shipyard of Seattle recently christened the 140-foot freezer longliner Emerald Queen in ceremonies for Emerald Overseas Company, also of Seattle.

The fourth North Pacific freezer longliner to come out of the Marco Shipyard in the past two years, the Emerald Queen was also the yard's second conversion of a former off-shore supply vessel for the longline fishery.

The conversion included an 18-foot extension of the deckhouse aft to provide additional accommodations; addition of a full shelter deck and enclosed baiting area; widening of the wheelhouse on the starboard side for fishing operations; and installation of the many systems necessary for fishing and processing,

EMERALD QUEEN Equipment List	
Main engines	Detroit Diesel
Auxiliary engines	Cummins
Engine controls	Mathers
Steering System	Hough Marine
Navigator	Furuno
Radar	Furuno
Video sounder	Furuno
Depth recorder	Furuno
Weather recorder/receiver	Furuno
SSB transceiver	Skanti
Gyrocompass system	Sperry
Intercom system	Atkinson
Pumps	Jacuzzi/MP
Refrigeration	Sabroe
Fishing machinery	Marco
Deck crane	Slattery/TICO
Crane fall winch	Pullmaster

including a complete Marco-designed hydraulics system, processing and freezing equipment and



The Emerald Queen can process more than 44,000 pounds of fish per day.

fishing machinery.

The Emerald Queen's main engines are two Detroit Diesel 12V-149s, providing 1,200 bhp. Auxiliary power is provided by two Cummins 855 marine diesels coupled with 350-kw generators and a Detroit Diesel 671 with a 125-kw generator.

Built in 1982 as the supply vessel Cheyenne Arrow, the Emerald Queen retains her original dimensions, with an overall length of 140 feet, beam of 34 feet, and depth of 12 feet. She has a refrigerated fish capacity of 493,830 pounds.

Fishing machinery aboard the Emerald Queen includes a longline hauler backed up by a MarcoMatic slack taker and a Marco gangion

unwinder. In addition, a Marco CircleMatic baiting machine will be installed later in the season at Marco Dutch Harbor; all of the necessary plumbing and foundations are already in place.

The Emerald Queen's process area is equipped with a Ryan 228 heading machine and gutting, cleaning, and packing tables by Flohr Metal Fabricators. The refrigeration system by Sabroe includes three eight-station horizontal plate freezers and three Sabroe compressors.

For free literature on the facilities and capabilities of Marco Shipyard,

Circle 36 on Reader Service Card



### From the Revenue Marine to the UNITED STATES COAST GUARD 200 YEARS of Distinguished Service



ABS is honored to have been a part of that history and continues to cooperate with the U.S. Coast Guard under a Memorandum of Understanding which recognizes the broad-based ABS combination of technical expertise and qualified surveyors and provides plan review and inspection.

ABS looks forward to continued coordination of its services with the U.S. Coast Guard to the advantage of the marine industry.

## ABS GROUP

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Circle 201 on Reader Service Card

### New Swagelok Miniature Quick-Connects Provide Extra Safety Feature

Miniature "QM" Series Quick-Connects, with double end shut-off stems, are now available from Swagelok Co., based in Solon, Ohio.

A valve in the new stem, and a poppet valve in the body, provide automatic shut-off in both halves of the connection when the unit is uncoupled. This is a safety benefit and can reduce fluid loss during uncoupling.

The miniature quick-connects feature easy fingertip operation. This type of connection eliminates cross threading, overtightening and galling, which can occur with some other methods of connecting very small lines. The connects can be used in many systems which require small tubing, piping, or hose.

For free literature available from Swagelok regarding the new quick-connects and their applications,

Circle 57 on Reader Service Card

### BoatLife Offers New Free Literature On Teakwood Cleaners

Maintenance of teakwood on passenger and cruise vessels can be time-consuming. With products available from BoatLife's Teak Brite teak care line, time and maintenance costs can be reduced considerably.

Teak Brite Cleaner and Teak Brite Teak Brightener both clean teakwood in a manner that makes sanding the wood unnecessary. Teak Brite Kremer Cleaner is a gel which is ideal for details and interiors because it can be wiped up rather than hosed down.

Teak Brite Oil & Sealer provides five to six months of protection after applying three light, rubbed-in coats. This product is available for both natural and golden teak.

For information and literature about BoatLife teak care products,

Circle 120 on Reader Service Card

### ABB Offers Eight-Page, Full-Color Brochure On Turbochargers

ABB Turbo Systems Ltd. of Baden, Switzerland, has published an eight-page, full-color brochure on the VTR..4E range of turbochargers manufactured by the company.

BBC turbochargers type VTR have been manufactured since 1944, during which time they have been continually adapted to suit the requirements of the market. The range of VTR..4E turbochargers meets the demands of modern two- and four-stroke engines equipped with power turbine systems. Owing to the excellent efficiency which, according to the company, is much higher than the engine really needs, it is possible to utilize some of the exhaust gases direct in the power turbine to improve the fuel consumption or to generate additional energy.

The brochure discusses the design and functional range of VTR turbochargers, development objectives, field of application, and the VTR design concept. Cutaway drawings, photos and graphs complement the descriptive text.

For more information and a free copy of the brochure on the VTR..4E range of turbochargers from ABB Turbo Systems,

Circle 126 on Reader Service Card

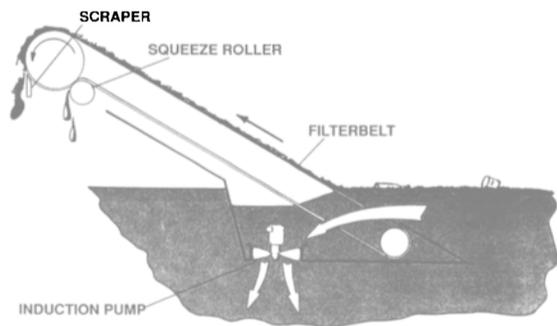
# FOR MORE INFORMATION ON EQUIPMENT AND SERVICES ADVERTISED IN THIS ISSUE

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The listings above are an editorial service provided for the convenience of our readers

## Marco Filterbelt System A Success In Canadian Recovery Testing



Artist's rendering of the Marco Filterbelt Oil and Debris recovery system.

At the Esso Canada Research Facility at Calgary, Alberta, Esso Petroleum and the Burrard Clean Oil Spill Response Cooperative of Vancouver, British Columbia, recently cosponsored a test of oil spill recovery equipment test effectiveness.

In order to make the test particularly diffi-

cult, the sponsors used Canadian-produced Cold Lake crude, a very dense, viscous product with a great tendency to cling to whatever it touches. In addition, pieces of debris were added to the oil.

The Marco Filterbelt recovery system was among those tested. Within 20 minutes, the 29-foot Class I vessel equipped with the system was filled to capacity with both the Cold Lake crude and the debris.

For more information regarding Marco's Filterbelt Spill Recovery System,

Circle 100 on Reader Service Card

## Versatile Pacific Shipyards Uses New Launching Technique For Hydrographic Survey Ship

A new hydrographic survey ship being built for the Canadian Government was floated out

recently at Versatile Pacific Shipyards(VPSI) in Victoria, B.C., Canada.

The state-of-the-art scientific vessel, constructed over 16 months at a cost of \$17 million, will be based in Newfoundland with Fisheries and Oceans Canada.

**Peter Quinn**, VPSI's chairman and chief executive officer, said the ship was moved from dry land onto the submersible barge Arctic Tarsuit at the Public Works Canada Graving Dock using a system of skid-shoes moving on portable trucks. The barge was then submerged, allowing the vessel to float off.

Mr. Quinn said the company will also launch two new search and rescue vessels by the same method later this year. The SAR 500 vessels are also being constructed in Victoria for the Canadian Coast Guard.

The Fisheries and Oceans survey ship has an overall length of about 168 feet, breadth of 34 feet and depth of 16 feet. It has a full displacement of 856 tons, is powered by twin-screw, 1,250 shaft horsepower, and will carry a crew of 19, including scientists.

For free literature detailing the facilities and capabilities of Versatile Pacific Shipyards,

Circle 19 on Reader Service Card

## L&C Associates Completes Deactivation Of M/V Cape Inscription

L&C Associates, Inc. recently announced the completion of a dehumidification and sealing system aboard the M/V Cape Inscription. The RO/RO is being dehumidified to protect it from corrosion while laid-up in Mobile, Ala.

Most notable to the installation is

the use of the Protective Sealing System (PSS) to seal openings leading to the dehumidified spaces. PSS is a spray-applied, semi-adhering, flexible, vinyl plastic which prevents moisture from migrating into the dehumidified spaces. Since PSS is strippable, the vessel can be reactivated quickly, a key requirement of the lay-up specification.

L&C technicians repaired and balanced the existing desiccant dehumidification system and rein-

stalled the ducting which distributes the dehumidified air. In addition, L&C conducted tests to verify that the d/h system will maintain the required relative humidity.

Dehumidified areas include: engine space, accommodations, steering gear, cranes, CO<sub>2</sub> room, anchor windlass and bow thruster.

For further information and free literature from L&C Associates,

Circle 14 on Reader Service Card

## Marsh & McLennan Names Scholin To Manage NAPVO Insurance Program



Douglas E. Scholin

Douglas E. Scholin has joined Marsh & McLennan, Incorporated, as manager of the National Association of Passenger Vessel Owners (NAPVO) insurance program. The program is designed exclusively by Marsh & McLennan for the members of NAPVO.

Mr. Scholin attended Meramec Community College and has 18 years' experience in the marine industry.

Marsh & McLennan, one of the nation's largest insurance brokerage firms, provides a full line of coverage for owners of paddle wheelers, cruise vessels and ferries.

For more information on services available from Marsh & McLennan,

Circle 5 on Reader Service Card



## New President At Cat Pumps Corporation



Steve Bruggeman

It was announced recently by William L. Bruggeman, founder and president for the past 22 years of the Cat Pumps Corporation, that his son, Steve Bruggeman, has been appointed to the position of president of the company. So that the company may continue to benefit from his experience and support, William Bruggeman retains his title of chief executive officer, while his son assumes full administrative, marketing and sales responsibilities for Cat Pumps.

Steve Bruggeman has served the company in several capacities over the years. His most recent position was general manager. He has been instrumental in the development of many Cat products, including SF pumps, 35 Frame pumps, TUFF Cat and reverse osmosis pumps.

## Shipboard corrosion problems solved.

Aeroquip engineers, working with the Navy on corrosion resistance technology for the DDG51 program, developed a line of noncorrosive Monel and stainless steel reusable fittings.

In addition to solving the corrosion problem, the Aeroquip designed hose fittings also extend service life and quickly refit at sea. Replacement fittings are not necessary. With Aeroquip reusable fittings, "inventory" is already in place on the old fluid line.

This corrosion resistance technology and product development solves the needs of shipbuilders everywhere. A range of reusable fittings in sizes from

3/8" to 10" are available. Configurations include 90° doglegs, male O-Ring seals, and 150 pound and 600 pound commercial flanges. If you have other requirements, call us and we'll team you with our engineers to solve your problem.

Send for FREE Bulletin 2286.

### Aeroquip Corporation

Industrial Connectors Division  
1225 West Main Street  
Van Wert, Ohio 45891-0389  
419-238-1190 Fax: 419-238-6833

### Other Aeroquip Marine Products

#### Reusable Fittings with Convuluted Teflon® Hose

NAVSEA approved... reusable fittings for rapid replacement of hose lines. Three piece, bolt-together fittings are easily assembled with hand tools.

\*Teflon is a DuPont trademark

Send for FREE Catalog 306A

Circle 347 on Reader Service Card

#### RISIC Couplings

Aeroquip RISIC 3 Couplings provide improved system flexibility for piping on ship water and oil service. RISIC 3 is approved for use on U.S. Navy surface and subsurface vessels.

Consult Aeroquip for your application.

Circle 269 on Reader Service Card

#### Marine Hose and Fittings

Aeroquip FC300 AQP® hose now has NAVSEA approval. FC300 hose has been engineered for demanding high temperature shipboard applications and is available with a complete selection of fittings. FC300 also exceeds SAE 100R5 specifications.

Request FREE Catalog 306A

Circle 348 on Reader Service Card



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Marine Products from TRIJOVA

IM62

# BUYERS DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER/Engineering News. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR/EN assumes no responsibility for errors. If you are interested in having your company listed in this Buyers Directory Section, contact John C. O'Malley at (212) 477-6700.

## ABRASIVES

Chesapeake Specialty Products, Inc., 5055 Northpoint Blvd., Baltimore, MD 21219

## AIRBORNE ULTRA-SOUND INSTRUMENTS

UE Systems, Inc., 12 West Main Street, Elmsford, NY 10523

## AIR CONDITIONING AND REFRIGERATION—REPAIR & INSTALLATION

Adrick Marine Corp., 320 Cantor Ave., Linden NJ 07036  
Bailey Group, 2323 Randolph Ave., Avenel, NJ 07001  
Stal Refrigeration AB, Butangsgatan 16, S-601 87 Norrköping, SWEDEN

## BALLAST

Genstar Stone Products, Executive Plaza IV, Hunt Valley, MD 21031  
Keel Co., 327 East B Street, Wilmington, CA 90744  
Mineral Research & Recovery Inc., 4565 S. Palo Verde, Ste 203, Tucson AZ 85714

## BARGE BUILDING

Conrad Industries, P.O. Box 790, Morgan City LA 70381

## BARGES—Leasing

McDonough Marine Service, P.O. Box 1825, Parkersburg WV 26101  
Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

## BASKET STRAINERS

Beaird Industries, P.O. Box 31115, Shreveport, LA 71130  
Cleveland Gear, 3249 E. 80 St., Cleveland OH 44104

## BEARINGS—Rubber, Metallic, Non-Metallic

B.F. Goodrich (formerly L. Q. Moffitt, Inc.) P.O. Box 5550, Akron, OH 44313  
Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241  
Thomson Gordon Ltd., 3225 Mainway, Burlington, Ont., CANADA L7M 1A6  
Waukesha Bearings, P.O. Box 798, Waukesha WI 53187

## BOILER CLEANING

Asea Stal, 50 Chestnut Ridge Rd., Montvail N.J. 07645  
Thomas C. Wilson, Inc., 21 11 44th Avenue, Long Island City, NY 11101

## BOILERS—Manufacturers

Aalborg Ciserv (Miami), Inc., 1539 SW 21st Avenue, Ft. Lauderdale, FL 33312

## BROKERS

Captain Astad Company, Inc., P.O. Box 350486, Ft. Lauderdale, FL 33335  
2900 Energy Centre, 1100 Poydras Street, New Orleans, LA 70163-2900  
Jack Faulkner, 2419 Caddy Lane, P.O. Box 371, Flossmoor IL 60422  
Mowbray's Tug & Barge Sales Corp., 35 De Hart St., Morristown NJ 07960

## BUNKERING

Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

## CARGO ACCESS EQUIPMENT

Morgan Crane Co. Inc. (Hiab SeaCranes and QMC Trident, Ferrari, Fassi marine cranes), 1300 Normandy Place, Santa Ana CA 92705

## CHAIN

Baldt, Inc., 6 M. Butler St., Chester, PA 19013  
Crandall Dry Dock Engineers Inc./Marit Chain, 21 Pottery Lane, Dedham MA 02026  
Lister Chain & Forge, 3810 Loomis Trail Road, Blaine, WA 98230  
Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020  
Washington Chain & Supply, 2901 Utah Ave South, Seattle WA 98124

## CHOCKING COMPOUNDS

ITW Philadelphia Resins, 130 Commerce Drive, Montgomeryville, PA 18936

## CLAMPING—Pipe, Tubes, Hose

ZSI, 32497 Schoolcraft Road, Livonia, MI 48105

## COMPACTORS

International Compactor, Inc., P.O. Box 5918, Hilton Head, SC 29938  
Resource Technology Group, P.O. Box 159, 1015 Middletown Ave., Northford CT 06472  
Thorne Compactors & Trash, Inc., 14055 Grand Avenue, Burnsville, MN 55337  
A/S Vesta, Skudehavsvvej 27, DK-2100 Copenhagen, DENMARK. Sales Agents: American United Marine Corp., 5 Broadway, Rt 1, Saugus, MA 01906, USA

## COMPUTERIZED INFORMATION SYSTEMS

TIMSCO, P. O. Box 91360, Mobile AL 36691

## CONDENSERS/SEPARATORS

Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130  
Doucette Industries, Inc., 701 Grantley Road, P.O. Box 2337, York, PA 17405

IMO Delaval Inc., P.O. Box 6550, Lawrenceville, NJ 08648

Wright Austin Co., 3250 Franklin St., Detroit MI 48207

## CONTROL SYSTEMS—Monitoring

ASEA, Inc., 4 New King St., White Plains, NY 10604  
Autronica Marine USA, 234 Industrial Parkway, Northvale, NJ 07647  
The Clark-Reliance Corporation, 16633 Foltz Industrial Parkway, Strongsville OH 44136  
Eldec Corp., P.O. Box 100, Lynnwood, WA 98046-0100  
Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950  
IMO Industries, Gems Sensors Division, One Cowles Rd., Plainville CT 06062  
MMC International (Marine Moisture Control), 60 Inip Dr, Inwood NY 11696

Marine Electric RPD, Inc., 50 Carol St., P.O. Box 1135, Clifton NJ 07014  
NAMCO Controls, 7567 Tyler Blvd, Mentor OH 44060  
Robertson Marine Systems, 3000 Kingman St., Suite 207, Metairie, LA 70006

TANO Marine Systems Inc., 4301 Poche Court West, New Orleans LA 70129

Teleflex Inc., 771 First Ave., King of Prussia, PA 19406

## CRANES—HOISTS—DERRICKS—WHIRLEYS

ASEA-Hagglund, Inc., 50 Chestnut Ridge Rd., Montvale NJ 07645  
The Crosby Group, Inc., P.O. Box 3128, Tulsa OK 74101  
Del Gavio Marine Hydraulics Inc., 207 W. Central Ave., Maywood NJ 07607  
telex: 132610 DELMARINE

Effer S.p.A., 40013 Castel Maggiore, Bo, ITALY

Liebherr-Werk Nenzing GES.mbh, P.O. Box 10, A-6710 Nenzing, AUSTRIA  
Marine Travelift, Inc., 49 E. Yew St., Sturgeon Bay, WI 54235

Morgan Crane Co. Inc. (Hiab SeaCranes and QMC Trident, Ferrari, Fassi marine cranes), 1300 Normandy Place, Santa Ana CA 92705

Pettibone-Tiffin Corp., 235 Miami St., Tiffin, OH 44883

Reco Crane Co., P.O. Box 10296, New Orleans LA 70181

Westmont Industries, 10805 Painter Ave., Santa Fe Springs, CA 90670

Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

## CYROGENICS

Technigaz, Division of Bouygues Offshore, 3 rue Stephenson, 78884 St. Quentin en Yvelines

## DECK MACHINERY—Cargo Handling Equipment

All Set Marine Lashing AB, P.O. Box 14112, S-161 14 Bromma, SWEDEN  
Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013  
Gearmatic—see 'Braden Carco Gearmatic' above.

Markey Machinery Co., Inc., 79 S. Horlot St., Seattle, WA 98134

McElroy Machine & Mfg. Co., Inc., P.O. Box 4455, Biloxi MS 39535

Morgan Crane Co. Inc. (Hiab SeaCranes and QMC Trident, Ferrari, Fassi marine cranes), 1300 Normandy Place, Santa Ana CA 92705

Slattery Equipment Co., Inc., 4403 20th Street East, Fife, WA 98424

Willem Pot b.v., P. O. Box 29102, 3001 GC Rotterdam, The Netherlands

## DECKS

Boatlife, 205 Sweet Hollow Road, Old Bethpage, NY 11804

## DEHUMIDIFIERS

L&C Associates, 216 Lafayette Rd., North Hampton NH 03862

## DIESEL ACCESSORIES—CYLINDER LINERS

Acurex Corporation, Autodata Division, 555 Clyde Ave., P.O. Box 7042, Mountain View, CA 94039

Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511

Diesel America Inc., 5217 River Rd., New Orleans LA 70123

General Thermodynamics Corporation, 210 South Meadow Road, P.O. Box 1105, Plymouth, MA 02360

Kiene Diesel Accessories, 325 S. Fairbanks St., P.O. Box 386, Addison IL 60101

## DIESEL ENGINE—Spare Parts & Repair

Aalborg Ciserv (Miami) Inc., 1539 SW 21st Avenue, Ft. Lauderdale, FL 33312

Alaska Diesel Electric, P.O. Box 70543, Seattle, WA 98107

Colt Industries Inc. Fairbanks Morse Engine Div. 701 Lawton Ave., Beloit, WI 53511

Cummins Engine Company, Mail Code 60011, Box 3005, Columbus, IN 47202-3005

Golden Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231

Grace Dearborn, W.R. Grace & Co., 300 Genesee Street, Lake Zurich, IL 60047

Hatch & Kirk, 5111 Leary Avenue NW, Seattle, WA 98107

Kim Hotstart Mfg Co., E 5724 Broadway Ave, P.O. Box 42, Spokane WA 99210

MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1, Federal Republic of Germany

MAN B&W Diesel, 50 Broadway, 18th Fl., New York, NY 10004

MTU of North America, 10450 Corporate Drive, Houston, TX 77478

Markisches Werk GmbH, P.O. Box 1442, D-5884 Halver 1, Federal Republic of Germany

Sulzer Brothers Inc., 200 Park Ave., New York, N.Y. 10166

## DIVING & SALVAGE

H.J. Merrihue, P.O. Box 23123, New Orleans LA 70183

## DRY DOCKS—Design

Marine Design Services, P.O. Box 928, Bonita CA 92002

M.A.N. GHH Sterkrade, P.O. B. 110240, D-4200 Oberhausen 11, West Germany

## ELECTRICAL EQUIPMENT

Consolidated Switch Gear Inc. P.O. Box 8745, Mandeville, LA 70470-8745

Eldec Corp., P.O. Box 100, Lynnwood, WA 98046-0100

L. F. Gaubert & Co., Inc., P. O. Box 50500, New Orleans LA 70150

MMC International (Marine Moisture Control), 60 Inip Dr, Inwood NY 11696

SPD Technologies, 13500 Roosevelt Blvd., Philadelphia PA 19116

## ELECTRONIC DISPLAY

Scandinavian Micro Systems, P.O. Box 155, N-1411, Kolbotn, NORWAY

## ELECTRONIC ENCLOSURES

A&J Manufacturing, 14131 Franklin Ave., Tustin CA 92680

## ELECTRONIC INFORMATION SUPPORT

Inventory Locator Service, 3965 Mendenhall Road South, Suite 10, Memphis, TN 38115

## ENGINE TEST EQUIPMENT

General Thermodynamics Corp., P.O. Box 1105, 210 S. Meadow Road, Plymouth, MA 02360

Instruments, Computers, & Controls, Inc., 6942 Haven Creek Dr., Katy TX 77449

## EQUIPMENT—Marine

Byrne, Rice & Turner, Inc., 1172 Camp St., New Orleans LA 70130

Dynabrade, 72 E Niagara St., Tonowanda NY 14150

Maritime Power Corp., 200 Henderson Street, Jersey City, NJ 07302

## EVAPORATORS

Alfa-Laval, Desalt A/S, Stamholmen 93, DK-2650 Hvidovre, Copenhagen, DENMARK

Aqua-Chem, Water Technologies Div., P.O. Box 421, Milwaukee WI 53201

Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130

Equipment Engineering, 666 Baker St., #265, Costa Mesa CA 92626

## FANS—VENTILATORS—BLOWERS

Carling Turbine Blower Company, 10 Nebraska St., P.O. Box 88, Worcester MA 01613

Jon M. Liss Associates, Inc., 411 Borel Ave., San Mateo, CA 94402

## FASTENERS

Non-Ferrous Bolt & Mfg Co., 4085 Nevso Dr., Suite C, Las Vegas NV 89103

Okabe Co., Inc., 175 Lively Blvd., Elk Grove Village, IL 60007

## FENDERING SYSTEMS/BUOYS—Dock & Vessel

Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

Milligan Marine Supply Inc., 5832 Harvey Wilson, Houston TX 77020

Rowe Bumpers, Conveyor & Caster Corporation, 3501 Detroit Avenue, Cleveland, OH 44113

Seaward International, Inc., Clearbrook Industrial Park, P.O. Box 98, Clearbrook VA 22624

## FUEL ADDITIVES, CONDITIONING

Fuel Conditioning, 2500 Hampton Blvd., Norfolk VA 23517

U.S. Borax/Industrial Chemicals, 3075 Wilshire Boulevard, Los Angeles, CA 90010

## GALLEY EQUIPMENT

Cospolich Refrigerator Co., 949 Industry Rd., Kenner LA 70062

Gaylord Industries, 10900 S W Avery St, P.O. Box 1149, Tualatin, OR 97062

McElroy Machine & Mfg Co., Inc., P.O. Box 4454, Biloxi MS 39535-4454

## GANGWAYS, LADDERS

Coast Marine & Industrial Supply Inc., 398 Jefferson St., San Francisco, CA 94133

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

Westmont Industries, 10805 Painter Ave., Santa Fe Springs, Los Angeles, CA 90670

Wooster Products Inc., 1000 Spruce St., P.O. Box 896, Wooster, OH 44691

## HORNS/WHISTLES

Kahlenberg Bros Co., P.O. Box 358, Two Rivers, WI 54241

## HOSE

HBD Industries, Inc., 1801 S. Railroad Street, Salisbury, NC 28145-0948

Nuflex, Inc., 1826 E. Elizabeth Avenue, Linden, NJ 07063

## HYDRAULICS

Aeroquip Corporation, 3000 Strayer, P.O. Box 631, Maumee, OH 43537-0631

Cunningham Marine Hydraulics Co., 201 Harrison St., Hoboken NJ 07030

Del Gavio Marine Hydraulics Inc., 207 W Central Ave., Maywood NJ 07607; telex: 132610 DELMARINE

## HYDROSTATIC REMANUFACTURING

Hydra Service, Inc., 12332 East First Street, Tulsa, OK 74128

## INCINERATORS

Teamtec A/S, P.O. Box 100, N-4912 Gjeving, NORWAY

A/S Vesta, 27 Skudehavsvvej, DK-2100 Copenhagen DENMARK. US Agent: American United Marine, 5 Broadway, Rte 1, Saugus, MA 01906

## INSULATION

Soundcoat Company, 1 Burt Drive, Deer Park, NY 11729

## INTERIOR DESIGN

Feathers Corp., P.O. Box 934, Langley WA 98260

## JOINER—Watertight Doors—Paneling—Ceiling Systems—Decking

IMAC AB, Berga Alle 1, S-252 55 Helsingborg, SWEDEN

U.S. Rep: Hopeman Brothers, Inc., P.O. Box 820, Waynesboro, VA 22980

E.H. O'Neill Company, 5515 Belair Rd., Baltimore MD 21206

Walz & Krenzer Inc., 1390 Mt. Read Blvd., Rochester NY 14606

## KEEL COOLERS

R.W. Fernstrum & Co., 1716 Eleventh Ave., Menominee, MI 49858

Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

The Walter Machine Co., Inc., 84-98 Cambridge Avenue, Jersey City, NJ 07307

## LEGAL SERVICES

John Jozwick, c/o Bryan, Schiffrin & McMonagle, First & Cedar Bldg., Suite 350, 2701 First Ave., Seattle WA 98121

## LIGHTING EQUIPMENT—Lamps, Fixtures, Searchlights

Carlisle & Finch, 4562 W. Mitchell Ave., Cincinnati OH 45232

Phoenix Products, 6161 N 64th St., Milwaukee WI 53218

## LINE BLINDS

American Piping Products Inc., Box 1056, New Hyde Park, NY 11040

Stacey/Fetterolf, P.O. Box 103, Skippack, PA 19474

## LOGISTICS

VL Logistics Consultants, Inc., 3420 Bienville Blvd., Ocean Springs MS 39564

MACHINERY MAINTENANCE, REPAIR, OVERHAUL, AND TESTING

Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DELMARINE

Golden Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231

## MACHINERY—On Site Repair

Furmanite, 535 London Bridge Road, Virginia Beach, VA 23454

## MARINE CHEMICALS

Nalfleet, Bull & Roberts, 155 Morris Ave., Springfield NJ 07081

## MARINE CONSULTING

Maritech, Seacliff, Bay Road, Newmarket, NH 03857

## MARINE FURNITURE

Alumna-Feathers Corp. (Marine Interior Design Div.), P.O. Box 728, Langley WA 98260

## NAVAL ARCHITECTS, MARINE ENGINEERS, SURVEYORS

Advanced Marine Enterprises, Inc., 1725 Jefferson Davis Hwy., Arlington, VA 22202

Aero Nav Laboratories, Inc., 14-29 112 St., College Point, NY 11356

Amirikian Engineering Co., P.O. Box 15210, Chevy Chase MD 20815

B.C. Research, 3650 Westbrook Mall, Vancouver, B.C. Canada V6S 2L2

CDI Marine Co., 9487 Regency Square Blvd., Suite 500, Jacksonville, FL 32225

CT Marine, 18 Church Street, Georgetown, CT 06829

Childs Engineering Corp., Box 333, Medfield, MA 02052

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

Crane Consultants, 15301 First Ave S., Seattle WA 98148

C.R. Cushing, 18 Vesey St., New York, NY 10007

Arthur D. Darden, 3100 Ridgeway Dr., Suite 101, Metairie LA 70002

Design Associates Inc., 14360 Chef Menteur Highway, New Orleans, LA 70129

Designers & Planners, 2011 Crystal Dr., Arlington VA 22202

Diversified Technologies, 812 Live Oak Dr., Chesapeake VA 23320

E.Y.E. Marine Consultants, Belmont House, 3

Kelvin Hughes Ltd., New North Rd., Hainault, Ilford, Essex IG6 2UR England  
Mackay Communications, 441 US Highway #1, P.O. Box 331, Elizabeth NJ 07207  
Magnavox MSS, 2895 Maricopa St., Torrance CA 90503  
Marine Electric RPD Inc., 50 Carol St., P.O. Box 1135, Clifton NJ 07014-1135  
Naval Electronics, 5417 Jetview Circle, Tampa FL 33634  
Radio Holland USA B.V., 8943 Gulf Freeway, Houston, TX 77017  
Robertson-Shipmate, Inc., 400 Oser Ave., Hauppauge NY 11788  
S.P. Radio A/S, DK-9200, Aalborg SV, DENMARK  
Singapore Telecom, Orchard Point Post Office, P.O. Box 38, Singapore 9123  
Sperry Marine Inc., 1070 Seminole Trail, Charlottesville VA 22906  
Trimble Navigation, 585 North Mary Avenue, P.O. Box 3642, Sunnyvale, CA 94088  
Watercom Communications Systems, 453 E. Park Place, Jefferson IN 47130

#### NOZZLES

Nautican Enterprises Ltd., 407 Mountain Highway, North Vancouver, B.C. V7J 2L1

#### OILS—Marine—Additives

Burmah-Castrol Inc., Raritan Plaza II, Raritan Center, Edison NJ 08837  
Castrol, Inc., Raritan Plaza II, Raritan Center, Edison, NJ 08837  
Exxon Company International, 200 Park Ave., Bldg 222, Room A279, Flaham Park NJ 07932, P.O. Box 4706, Houston, TX 77210-4706  
Mobil Oil Corporation, 3225 Gallows Road, Fairfax, VA 22037-0001  
Texaco, International, 2000 Westchester Avenue, White Plains NY 10650

#### OIL/WATER SEPARATORS

Alfa Laval Inc., 2115 Linwood Ave., Fort Lee NJ 07024  
Centrico, Inc. (Westfalia Separators), 100 Fairway Court, Northvale NJ 07647  
FAST Systems, Inc., 1717 Sublette Avenue, St Louis MO 63110  
Jofra, 67-55 Woodhaven Boulevard, Rego Park, NY 11374  
MMC International (Marine Moisture Control), 60 Inip Dr, Inwood NY 11696

#### PAINTS—COATINGS—CORROSION CONTROL

American Abrasive Metals Co., 460 Coit St, Irvington NJ 07111  
Armorica Sales Inc., 2 Marineview Plaza, Hoboken NJ 07030  
Chugoku Marine Paints (USA) Inc., 1610 Engineers Road, Belle Chasse, LA 70037  
Esgard, Inc., P.O. Drawer 2698, Lafayette, LA 70502  
International Paint (USA) Inc., 6001 Antoine Dr., P.O. Box 4806, Houston TX 77210-4806  
LTC International, 101-G Executive Dr., Sterling VA 22170  
Sigma Coatings, 8979 Market St., Houston, TX 77029, 330 Rover Road, Harvey, LA 70059, 1100 Adams St., Hoboken, NJ 07030  
Walter Thorsen, Inc./PROTECNO, 79 Oweno Road, P.O. Box 755, Mahwah, NJ 07430-0755  
Unitor Ships Service, Unitor Marine Chemicals Division, 3 High St., Rickmansworth, Herts, WD3 1SW UNITED KINGDOM

#### PIPE FITTINGS/CONNECTING SYSTEMS

Aeroquip Corporation, 3000 Strayer, P.O. Box 631, Maumee OH 43537-0631  
Deutsch Metal Components, 14800 S. Figueroa, Gardena, CA 90248  
IMO Industries Inc., Wiggins Connectors Div., 5000 Triggs St., P.O. Box 22228, Los Angeles CA 90022

#### PORT SERVICES

Port of Iberia, P.O. Box 897, New Iberia LA 70561

#### PROPULSION EQUIPMENT—Bowthrusters, Diesel Engines, Gears, Propellers, Shafts, Turbines

ASEA Brown Boveri, 1460 Livingston Ave., North Brunswick NJ 08902  
Bergen Diesel A/S, P.O. Box 924, N-5002, Bergen, NORWAY  
Bird Johnson Company, 110 Norfolk St., Walpole, MA 02081  
Burmester & Wain Alpha Diesel AS, DK 1400 Copenhagen K, Denmark  
Cincinnati Gear Co., 5657 Wooster Pike, Cincinnati, OH 45227  
Colt Industries Inc. (Fairbanks Morse Engine Div.), 701 Lawton Avenue, Beloit, WI 53511  
Cummins Engine Company, Mail Code 60011, Box 3005, Columbus, IN 47202-3005  
Deutz Corp., 7585 Ponce de Leon Circle, Atlanta, GA 30340  
Electro-Motive Division of GM, 9301 W 55th St., LaGrange, IL 60525  
Fincantieri, Diesel Engines Division—GMT, Bagnoli della Rosandra 334, Trieste, ITALY  
GE Marine & Industrial, 1 Neumann Way N-158, Cincinnati OH 45215  
GE Naval & Drive Turbine Systems Department, 166 Boulder Dr., Fitchburg MA 01420  
General Motors, Allison Gas Turbine, P. O. Box 420, U-6, Indianapolis IN 46206  
KaMeWa, P.O. Box 1010, S 681 01 Kristinehamn, SWEDEN  
Kahlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241  
Krupp MaK, 226 Britannia Road East, Mississauga, Ont., CANADA L47156  
Mapeco Products Inc., P.O. Box 6, 725 Glen Cove Ave., Glen Head NY 11545  
Marine Gears, Inc., P.O. Box 689, Greenville MS 38707  
Marine Systems Inc., 2032 Atlantic Ave., Chesapeake VA 23324  
Markisches Werk, Halve, P.O. Box 1442, D-5884 Halver WEST GERMANY  
MAN B&W Diesel, 50 Broadway, New York, NY 10004  
MAN B&W Diesel A/S, Ostervej 2, DK-4960 Hoelby, Denmark  
MAN B&W Diesel A/S, Alpha Diesel, Niels Juels Vej 15, DK-9900 Frederikshavn Denmark  
MAN B&W Diesel GmbH, Stadtbachstrasse 1, D-8900 Augsburg 1 Germany

Sargent & Herkes, 225 Baronne St., Suite 1405, New Orleans LA 70112  
Sea School, 10812 Gandy Boulevard, St. Petersburg, FL 33702  
Seaworthy Systems Inc., P.O. Box 338, Essex, CT 06426; 17 Battery Pl., New York, NY 10004; P.O. Box 205, Solomons MD 20688; 2 Skyline Pl., 5203 Leesburg Pike, Falls Church VA 22041.

Seaworthy Electrical Systems, 17 Battery Pl. N.Y. N.Y. 10004  
George G. Sharp, Inc., 100 Church St., New York, NY 10007  
R.A. Stearn, Inc., 253 N. 1st Ave., Sturgeon Bay, WI 54235  
Systems Engineering Associates (SEACOR), 200 East Park Dr., Suite 600, Mt Laurel NJ 08054

#### TIMSCO, P. O. Box 91360, Mobile AL 36691

#### NAVIGATION & COMMUNICATIONS EQUIPMENT

Comsat Maritime Services, 950 L'Enfant Plaza SW, Washington DC 20024  
Furuno U.S.A., 271 Harbor Way, S. San Francisco, CA 94080  
Henschel, Inc., 9 Hoyt Drive, Newburyport MA 01950  
Morrison-Knudsen Company, Power Systems Division, P.O. Box 1928, Rocky Mount NC 27801  
MTK Magnetek Inc., 11111 Santa Monica Blvd., Los Angeles CA 90025  
Northwest Marine Services Corp., 6452 So. 144th St., Tukwila WA 98168  
Omnithruster Inc., 9515 Sorensen Ave., P.O. Box 2144, Santa Fe Springs, CA 90670  
Ovako Steel Couplings AB Sweden, S-813 00 Hofors SWEDEN  
Propulsion Systems, 1441 N Northlake Way, Seattle WA 98103  
Rolla SP Propellers SA, Via Silva 5, P.O. Box 251, 6828 Balerna SWITZERLAND  
Seatrak Industrial Marine, 834 W Production Place, Newport Beach CA 92663  
Karl Senner Inc., 25 W Third, Kenner LA 70062  
Schottel-Werft, D-5401 Spay, West Germany  
Stewart & Stevenson, 1400 Drestehen, P.O. Box 8, Harvey LA 70059-0008  
Sulzer/Escher Wyss, Ravensburg WEST GERMANY

Ulstein International, A/S, N-6065 Ulsteinvik, NORWAY  
Ulstein Maritime Ltd., 96 North Bend Street, Coquitlam BC CANADA V3K 6H1  
Oy Wartsila Ab, Vasa and Abo Divisions, Vasa Factory, FINLAND  
ZF of North America, Marine Sales, 500 Barclay Blvd, Lincolnshire IL 60069

#### PROTECTIVE WRAPS

FANA (Film Applicators of North America), 1260 E Woodland Ave., Springfield PA 19064

#### PUMPS—Repairs—Drives

Del Gavio, 207 W. Central Ave., Maywood, NJ 07607. Telex: 132610 DEL-MARINE  
Golten Marine Company Inc., 160 Van Brunt Street, Brooklyn, NY 11231  
Houser Marine, Lario Division, 1713 S McKenzie St., Foley AL 36535  
Imo-Delaval, Inc., IMO Pump Division, Box 447, Monroe NC 28810  
Jim's Pump Repair, 48-55 36th St., Long Island City NY 11101  
Megator Corporation, 562 Alpha Drive, Pittsburgh, PA 15238  
Vita Motivator, 99 W Hawthorne Ave., Suite 622, Valley Stream NY 11580

#### REMOTE VALVE OPERATORS

Teleflex, Inc., 771 First Ave., King of Prussia, PA 19406

#### ROPE—Manila—Nylon—Hawsers—Fibers

Allied Signal Inc., Fibers Division, 1411 Broadway, New York, NY 10018  
Atlantic Cordage Corp., 60 Grant Ave., Carteret, NJ 07008  
Samson Ocean Systems, 2090 Thornton St., Ferndale WA 98248

#### SANITATION DEVICES—Pollution Control

Byrne, Rice & Turner, Inc., 1172 Camp Street, New Orleans, LA 70130  
Envirovac Inc., 1260 Turret Dr., Rockford, IL 61111  
FAST Systems, Inc., 1717 Sublette Avenue, St Louis MO 63110  
Precision Control Inc., 3154 Martin Rd., Walled Lake MI 48088  
Research Products/Blankenship (Incinolet), 2639 Andjon, Dallas, TX 75220

#### SCAFFOLDING

Spider Staging Corp., 13536 Beacon Coal Mine Rd S., Seattle WA 98178

#### SCALE MODELS

Sturgeon Bay Model Shop, 187 N Ninth Ave., Sturgeon Bay WI 54235

#### SCUTTLES/MANHOLE

L.S. Baier & Assoc., 7527 NE 33rd Dr., Portland OR 97211  
Walz & Krenzer, Inc., 725 Glen Cove Ave., P.O. Box 6, Glen Head NY 11545

#### SHIPBUILDING EQUIPMENT

M.A.N.—GHH, Sterkrade Werfstrabe 112 D-4100 Duisburg 18, West Germany  
MAN—GHH, P.O. Box 110240, D-4200 Oberhausen 11, West Germany  
NEI Syncrolift, Inc., 8970 S W 87th Ct., Miami FL 33176  
Offshore Industries, Inc., 144 Railroad Ave., Suite 206, Edmonds WA 98020  
SHIPBUILDING—Repairs, Maintenance, Drydocking  
Astilleros Espanoles S.A., Padilla 17, 28006 Madrid, SPAIN  
Avondale Industries Inc., P.O. Box 50280, New Orleans LA 70150  
Bender Shipbuilding & Repair Company, Inc., P.O. Box 42, Mobile AL 36601  
Bethlehem Steel, Martin Tower, Bethlehem PA 18106  
Bethlehem Steel, Baltimore Marine Div., Sparrows Point Yard, Sparrows Point MD 21219  
Blount Marine, Box 368, Warren RI 02885  
Brodosplit Shipbuilding Industry, Put Udarnika 19, P.O. Box 17, 58000 Split YUGOSLAVIA  
Curacao Drydock (USA), Inc., P.O. Box 3012, Curacao, Netherlands Antilles  
Equitable Shipyards Inc., Trinity Marine Group, Box 29266, New Orleans LA 70189  
Fincantieri SpA Cantieri Navali Italiani, Via Cipro 11, 16129 Genoa ITALY  
Gladding-Hearn Shipbuilding, The Duclos Company, One Riverside Avenue, Box 300, Somerset, MA 02726  
Houston Ship Repair, 1621 Woods Dr., P.O. Box 489, Channelview, TX 77530  
Hyundai Corporation, ShipSales Dept., 140-2 Kye dong, Chongro ku, Seoul, KOREA  
Hyundai Mipo Dockyard Ltd., 456 Cheonha-Dong, Ulsan, KOREA  
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Jeffboat, Inc., P.O. Box 610, Jeffersonville IN 47130  
Koch Ellis Barge & Ship Service, P.O. Box 9130, Westwego LA 70094  
Lisnave, Apartado 2138, 1103 Lisbon, Codex PORTUGAL  
M.A.N. GHH Sterkrade, P.O.B. 110240, D-4200 Oberhausen 11, West Germany  
MIL Davie, Inc., P.O. Box 130, Levis, Quebec, CANADA  
Marco, Inc., 2300 W Commodore Way, Seattle, WA 98199  
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Master Marine, Inc., P.O. Box 665, Bayou La Batre, AL 36509  
Munson Manufacturing, 150 Dayton, Edmonds WA 98020  
Newport News Shipbuilding, 4101 Washington Ave., Newport News, VA 23607  
New York Shipyard Corp., One Beard St., Brooklyn NY 11231  
North Florida Shipyard, Commodore Point, P.O. Box 3255, Jacksonville FL 32206  
SeaArk, P.O. Box 210, Monticello AR 71655  
Service Marine Industries, P.O. Box 3606, Morgan City LA 70381  
Skipperliner Shipyards, 621 Park Plaza Dr, Dept 21, LaCrosse WI 54601  
Swath Ocean, 979 G Street, Chula Vista, CA 92001  
3 Maj Associates Shipbuilding Industry, P. O. Box 117, 51001 Rijeka YUGO-SLAVIA  
Textron Marine Systems, 6600 Plaza Drive, New Orleans, LA 70127-2584  
Trinity Marine Group, Box 29266, New Orleans LA 70189  
Wartsila Marine Industries AB, P.O. Box 1090, SF 00101 Helsinki, FINLAND  
Willard Marine Co., Inc., 1250 N. Grove Street, Anaheim, CA 92806  
Zidell Explorations, Inc., 3121 S.W. Moody Street, Portland, OR 97201  
Zodiac of North America Inc., Thompson Creek Rd., P.O. Box 400, Stevensville, MD 21666

#### SIMULATOR TRAINING

Marine Safety International, Marine Air Terminal, LaGuardia Airport, NY 11371

#### SILENCERS

Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130

#### STAINLESS PLATE

Eastern Stainless Division, Cyclops Corporation, P.O. Box 1975, Baltimore MD 21203

#### STUFFING BOXES

Kohlenberg Bros. Co., P.O. Box 358, Two Rivers, WI 54241

#### SURVIVAL EQUIPMENT

Schat-Marine Safety Corp., P.O. Box 465, Foot of Industrial Rd., Farmingdale, NY 07727  
Stearns Manufacturing, P.O. Box 1498, St. Cloud MN 56302  
Viking Life Saving Equipment, 1625 N Miami Ave., Miami FL 33136

#### TANK CLEANING

Houston Ship Repair, 1621 Woods Dr., P.O. Box 489, Channelview, TX 77530

#### TANK LEVELING INDICATORS

Autronica Marine USA, 234 Industrial Parkway, Northvale, NJ 07647  
IMO Industries, Gems Sensors Division, One Cowles Rd, Plainville CT 06062  
King Engineering Corp., P.O. Box 1228, Ann Arbor MI 48106  
MMC International (Marine Moisture Control), 60 Inip Dr, Inwood NY 11696  
Saab Marine Electronics AB, P.O. Box 13045, S-402 51 Goteborg SWEDEN

#### TESTING

Wyle Laboratories, 128 Maryland St., El Segundo CA 90245; P.O. Box 077777, Huntsville AL 35807-7777

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The Guest Company of Meriden, Conn., recently announced its Beamer® series of wireless or single-wire, remote-controlled, high-intensity spotlights. According to the company, comparative tests have shown the new 100-watt Halogen lights to be twice as bright as competitive brands claiming one-million candlepower.

Illumination brilliance is only the beginning. Beamer's unique design features ease of operation, simplicity of installation and superb directional capability. Its ergonomically designed controls, hard-wired or wireless, feature a three-position, waterproof switch assembly and directional pushbuttons, not a joystick movement. Power, center-off and light functions allow the Beamer to be rotated into position with the light off, eliminating the embarrassment of blinding your dockside or mooring neighbor, or yourself.

Its wireless RF remote control has a range of up to 180 feet on or off the boat, indoors or out.

Beamer's full range of movement offers adjustment angles of 45 degrees up and 35 degrees down. Up, down, left or right, the light goes where it's needed when it's needed.

For further information and free literature on the Beamer or any of Guest's other marine products,

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#### TURBINES

IMO Delaval Inc., P.O. Box 6550, Lawrenceville, NJ 08648

#### TURBOCHARGERS

Cooper Industries, Energy Services Group, North Sandusky St., Mt. Vernon, OH 43050

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American Vulkan Corporation, P.O. Drawer 673, 2525 Dundee Rd., Winter Haven, FL 33882-0673

Cajon Co., 9760 Shepard Rd., Macedonia, OH 44056

Circle Seal Controls, Brunswick Corporation, P.O. Box 3666, Anaheim, CA 92803

Cla-Val Co., P.O. Box 1325, Newport Beach, CA 92663

Crawford Fitting Company, 29500 Solon Road, Solon, OH 44139

Unico Corporation, 214 N Hawaiian Ave., P.O. Box 306, Wilmington CA 90748

Elliott Manufacturing, P.O. Box 773, Binghamton, NY 13902

Stanley G. Flagg Company, 1020 W. High Street, Stowe, PA 19464

Loeffler Machine, US #1 & Robbins Ave., Pennel PA 19047

MMC International (Marine Moisture Control), 60 Inip Dr, Inwood NY 11696

Nupra Co., 4800 E. 345th St., Willoughby, OH 44094

Research Tool & Die Works, 17124 S Keegan Ave., Carson CA 90746

Stacey/Fetherolf, P.O. Box 103, Skippack, PA 19474

Swagelok Company, 5171 Hudson Dr., Hudson, OH 44236

Whitey Co., 318 Bishop Road, Highland Heights, OH 44143

Zidell Explorations, Inc., 3121 SW Moody Ave., Portland OR 97201

#### VIBRATION ANALYSIS

DLI Engineering Corp., 253 Winslow Way West, Bainbridge Island, WA 98110

T. W. Spaetgens, 156 W 8th Ave., Vancouver BC CANADA V5Y 1N2

Vibranalysis Engineering Corp., 4380 S. Wayside, Suite 100, Houston TX 77087

#### WASTEWATER TREATMENT

EES Corporation/Omnipure, An Eltech Systems Company, 12850 Bourne-wood Dr., Sugarland TX 77478

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Alfa-Laval, Desalt A/S, Stamholmen 93, DK-2650 Hvidovre, Copenhagen, DENMARK

Beaird Industries Inc., P.O. Box 31115, Shreveport LA 71130

Everpure, Inc., 660 N. Blackhawk Dr., Westmont, IL 60559

Matrix Desalination, Inc., 3295 SW 11th Avenue, Fort Lauderdale, FL 33315

#### WEATHER CHART RECORDERS

Alden Electronics, 40 Washington St., Westborough, MA 01581

#### WELDING

American Durweld Sales, P.O. Box 850, Scituate MA 02066

Welding Consultants USA, 10399 Paradise Blvd. #101, St. Petersburg, FL 33706

#### WINCHES AND FAIRLEADS

Braden Carco Gearmatic, P.O. Box 547, Broken Arrow, OK 74013

Gearmatic—see 'Braden Carco Gearmatic' above.

MMC International (Marine Moisture Control), 60 Inip Dr, Inwood NY 11696

Markey Machinery Co., 79 South Horton St., Seattle, Washington 98134

Smith Berger Marine Inc., 516 S. Chicago St., Seattle, WA 98108

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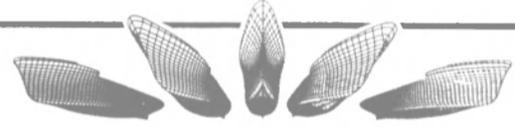
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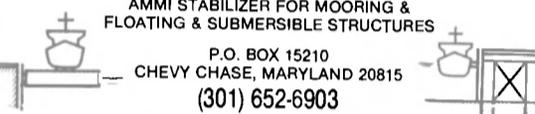
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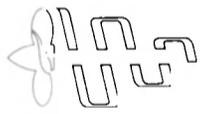
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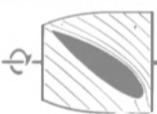
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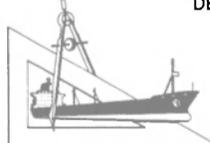
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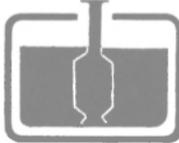
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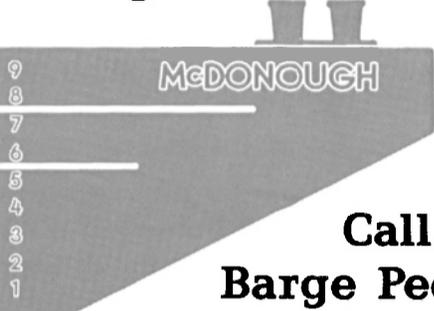
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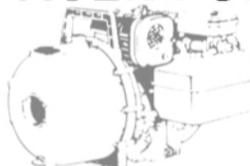
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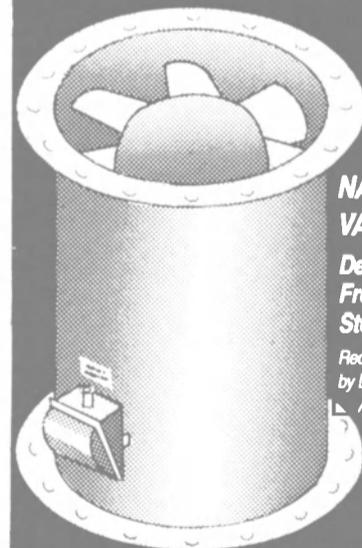
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- SMM '90 HAMBURG SHOW**  
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## \*OCT

Ad Closing  
Sep 4

- ANNUAL SNAME ISSUE**  
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- SNAME—9th ANNUAL INTERNATIONAL  
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- Fish Expo '90  
Boston, MA  
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- SNAME Show  
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\* NOTE — 1990 SNAME Annual—New Location and Date—Will be featured this year in the OCTOBER Issue of Maritime Reporter.

## NOV

Ad Closing  
Oct 1

- WORKBOAT SHOW**
- GASTECH '90**  
14th International LNG/LPG Conference & Exhibition
- OUTSTANDING WORKBOATS OF 1990**  
— A Review — The most important new commercial shallow-draft boats constructed in 1990 will be featured along with the builder of these outstanding vessels — towboats, tugs, barges, crew boats, supply boats, etc.

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- GASTECH '90  
Amsterdam, The Netherlands  
December 4-7
- Workboat Show  
New Orleans, LA  
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## DEC

Ad Closing  
Nov 5

- MARITIME 2000**  
Latest Trends and Predictions by Marine Industry Leaders for the Commercial and Naval Shipbuilding, Boatbuilding and Vessel Repair, Marine Equipment, Cruise Industry, and Inland and Offshore Markets. Year-End Statistics and Data.
- NAVAL TECHNOLOGY & SHIPBUILDING  
(SPECIAL PULL-OUT SUPPLEMENT)**  
— Where It Goes — Changes — Additions — The Final Score
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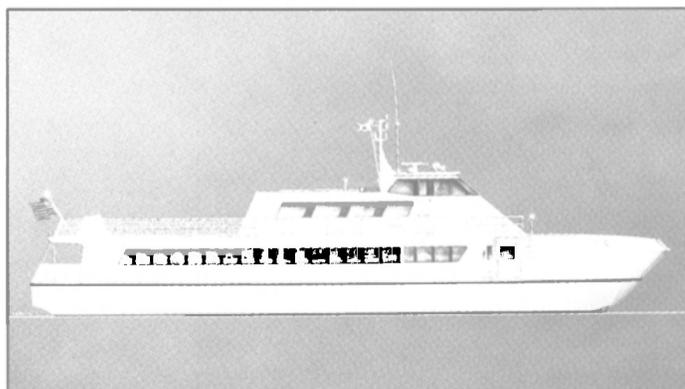
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